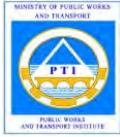


Attachment 4

Manual for Formulation of Detail Land Use Plan and Detail Zoning Code



**The Project for Urban Development Management in Lao PDR
(ViLUCC)**

Manual for Formulation of Detail Land Use Plan and Detail Zoning Code

October, 2016



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1 INTRODUCTION

1.1 Objectives of the Manual

This manual guides activity for formulation and approval of Detail Land Use Plan (D-LUP) and Detail Zoning Code (D-ZC) in Vientiane Capital. D-LUP and D-ZC are new instruments for urban development management which regulate new building and land use activities in existing urbanized area and large-scale urban development project. The manual is designed to be used by those who are involved in urban development management activities as follows:

- Administrative in charge of formulation and approval of D-LUP and D-ZC, and building permission
- Consultants and Architect which prepare D-LUP and D-ZC

The manual addresses urban management system in Vientiane Capital, and process and the technical matters for formulation and approval of D-LUP and D-ZC, which is compiled based on the discussion results and materials which were prepared by the JICA Technical Cooperation Project for Urban Development Management in Laos. The manual consists of main topics as follows:

- Urban development management system: Role of D-LUP and D-ZC in urban development management, permission procedure, purpose, target and administration
- Process and technical considerations in formulation of D-LUP and D-ZC
- Approval process including public consultation for D-LUP and D-ZC
- Technical instruction of GIS for formulation of D-LUP and D-ZC

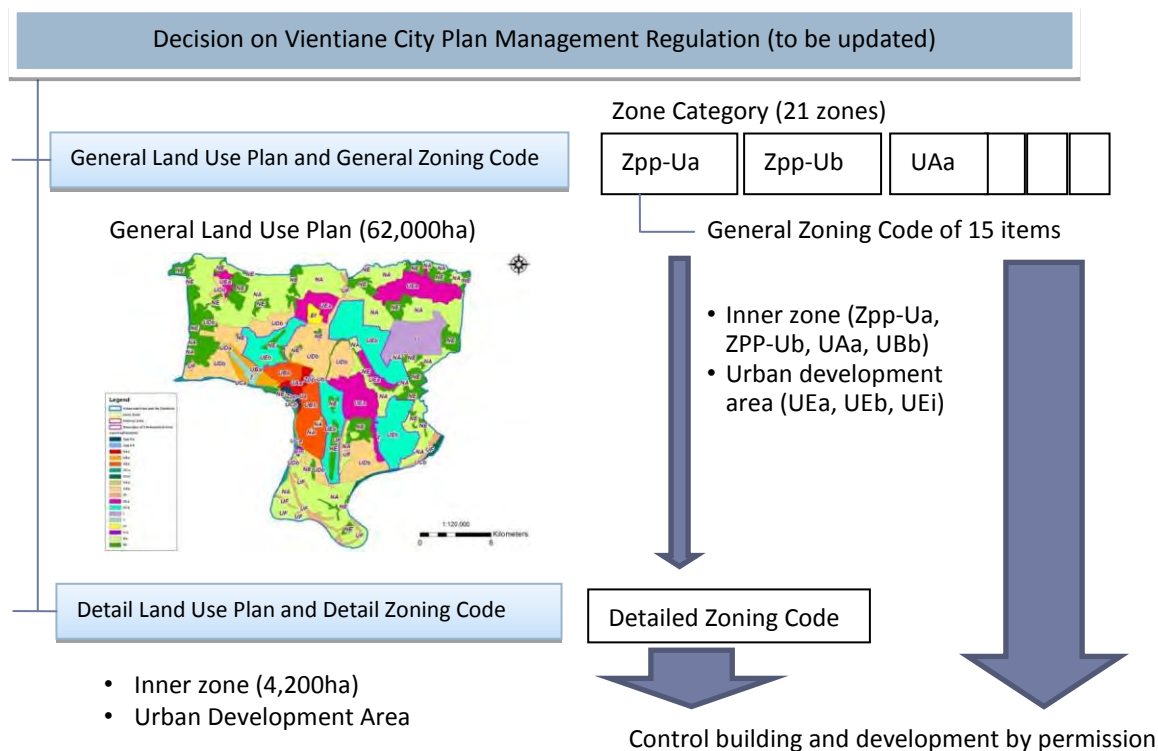
1.2 Structure of the Manual

Manual is composed of important points which are necessary to be understood for formulation of D-LUP and D-ZC:

- Outline of urban development management
 - Land Use Control System in Vientiane
 - Role of D-LUP and D-ZC in urban management
 - Permission system
- Plan formulation procedure
 - Work flow of formulation of Concept Plan, DUP and D-ZC
 - Formulation of Concept Plan (STEP 1 – STEP 3)
 - Formulation of D-LUP (STEP 4A – STEP 6A)
 - Formulation of D-ZC (STEP 4B – STEP 7B)
 - Building survey
- Public consultation: Strategic Environmental Assessment (SEA)
 - Outline of SEA
 - Procedure of Stakeholder Meeting (SHM)
- Approval process

2 URBAN DEVELOPMENT MANAGEMENT

2.1 Land Use Control System in Vientiane



2.2 Permission System in Vientiane

Three types of permission, namely (U) urban development certificate, (L) land development permission, (B) building permission are required. For building construction (B) building permission is required.

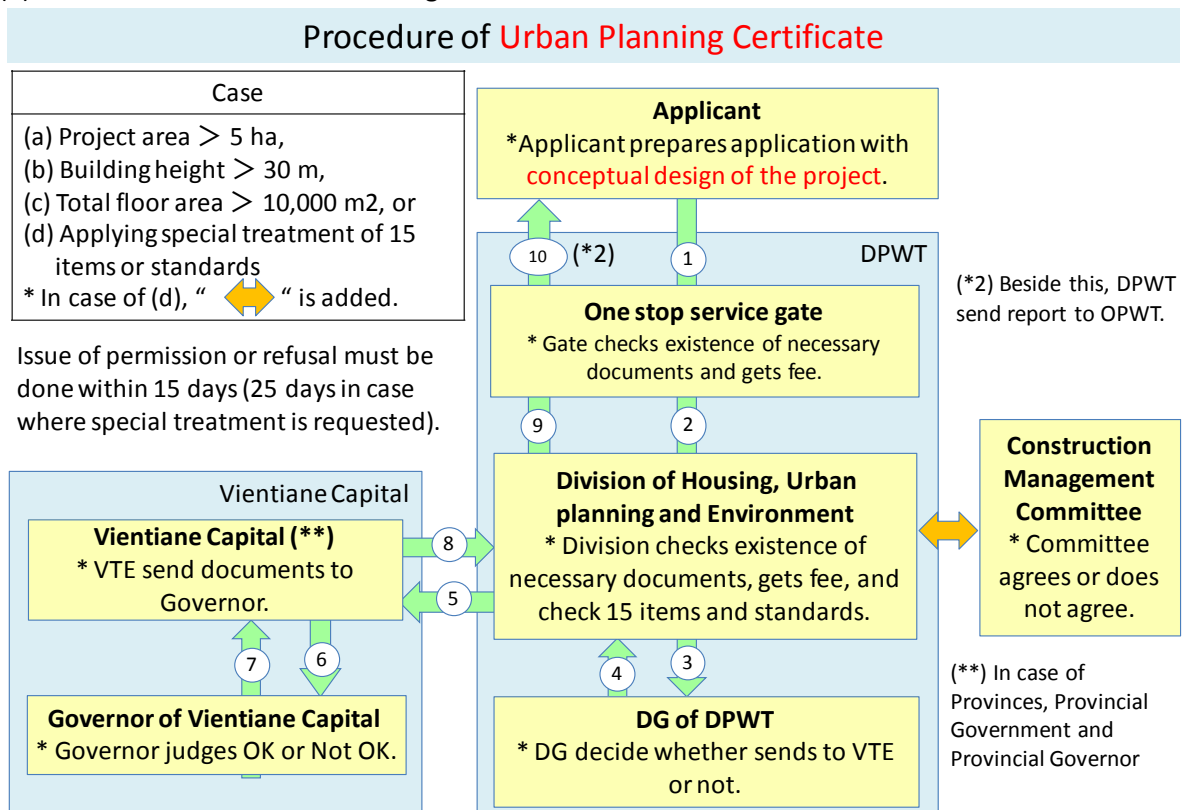
	(U) Urban Planning Certificate	Construction Permission	
		(L) Land-development Permission	(B) Building Permission
Target	Large Projects, such as: - more than 5 ha in project area, - more than 30 m in building height of the tallest one, or - more than 10,000 m ² in total floor area of buildings.	Project involving construction of new roads	Building construction and the like.
Applicant	Developer	Developer	Building owner
Purpose	To examine whether basic plan of infrastructure and buildings complies with related standards and 15 items or not. It is helpful for developer to know the possibility of construction permission prior to starting detail design.	To examine whether each detail design of infrastructure, such as road, complies with related standards or not.	To examine whether each detail design of building complies with 15 items or not.

	(U) Urban Planning Certificate	Construction Permission	
		(L) Land-development Permission	(B) Building Permission
Drawings for the application	Basic plan of infrastructure and buildings including: - Allocation and capacity of infrastructure, and - Use and volume of expected buildings.	Detail design of infrastructure including: - Detail structure of section of road, - Detail design of drainage, etc.	Detail design of building including: - Allocation plan in the site, - Each floor plans of building, - Elevation plans of building, etc.
Occasion to apply	- After completion of basic plan, and - before starting detail design of infrastructure and buildings.	- After completion of detail design of infrastructure, and - Before starting construction work of infrastructure.	• After completion of detail design of a building, and • Before starting construction work of building.
Area of application	Whole development area.	Whole development area or its part. (It is acceptable to apply for a part of (U), one after another, depending on the proceeding of development.)	Each building site. (Application must be done for each building site.)
Criteria	Land-development Standard and 15 items (Compliance in detail is examined in the process of (L) and (B).)	Land-development Standard	15 items (& Building Code in future)

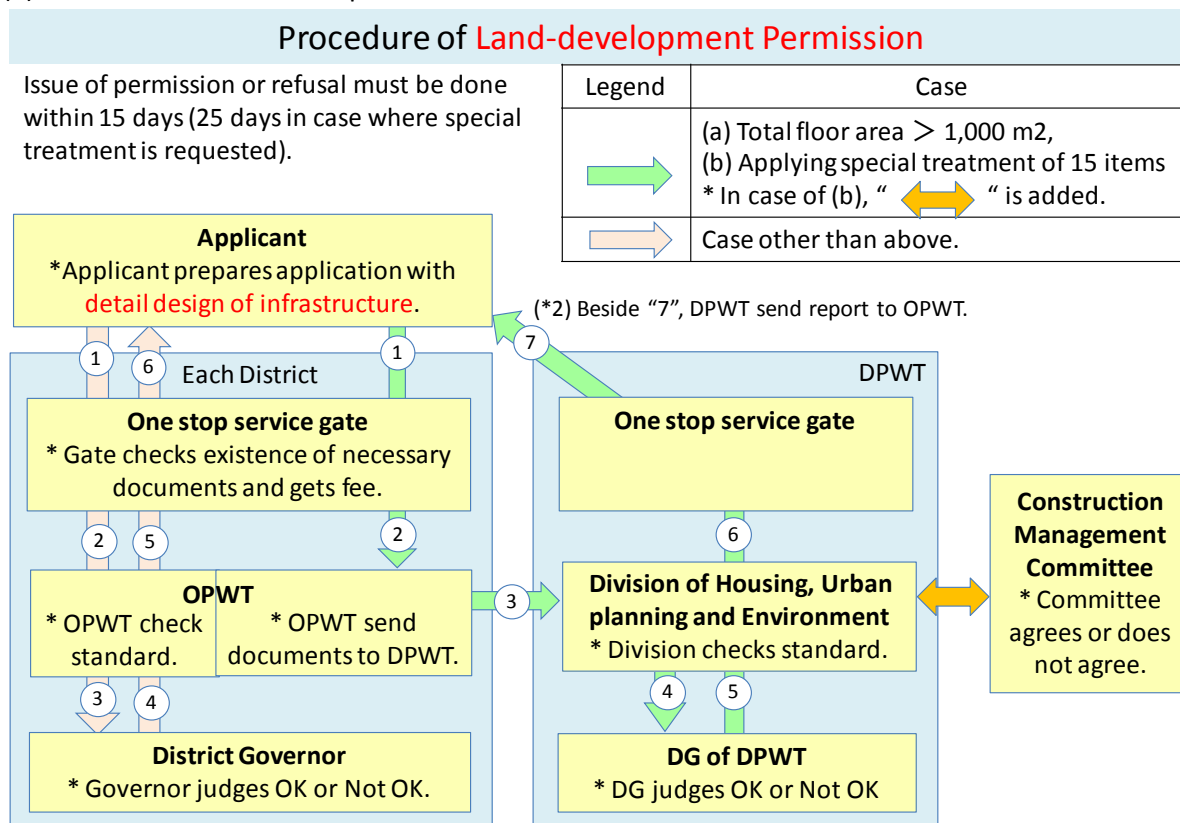
2.3 Administration for Permission Procedure

Administration of permission procedure is different depending on the scale of development.

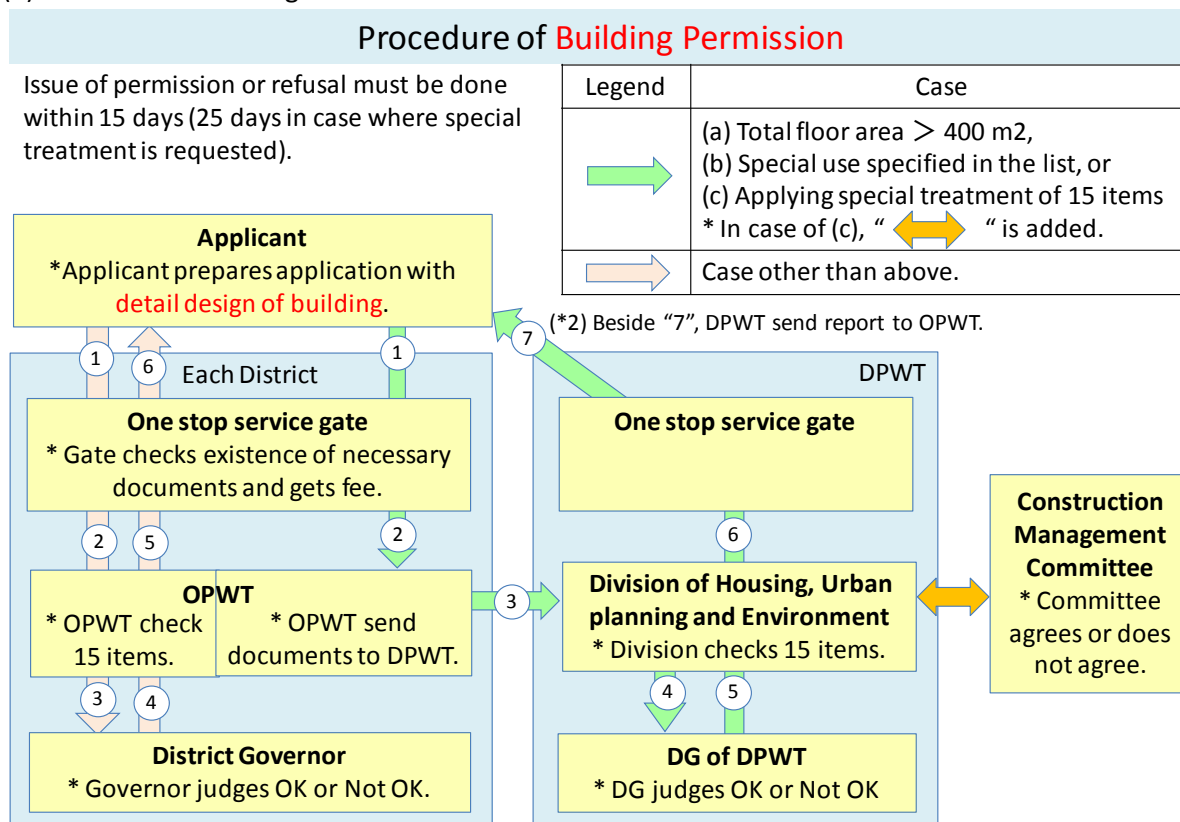
(1) Procedure of Urban Planning Certificate



(2) Procedure of Land-development Permission



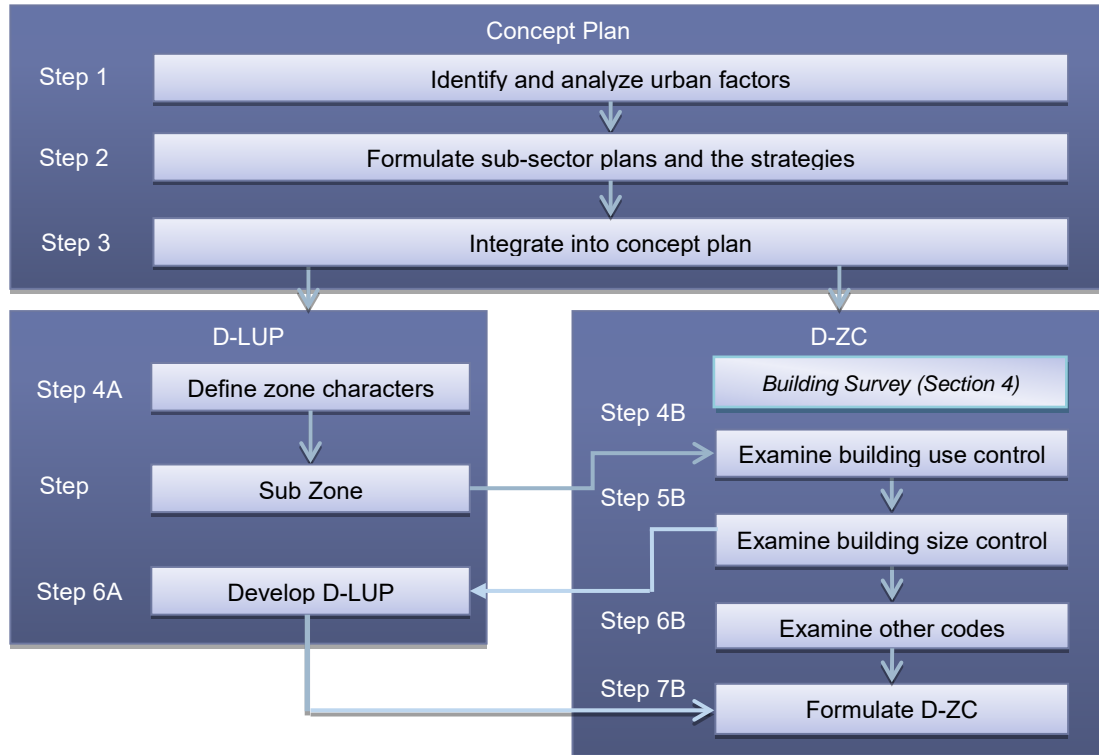
(3) Procedure of Building Permission



3 FORMULATION OF D-LUP AND D-ZC

3.1 Work Flow

Work flow is composed of concept plan formulation, D-LUP formulation and D-ZC formulation.



3.2 Formulation of D-LUP and D-ZC

Concept Plan Formulation

STEP 1: Identify and Analyze Urban Factors

Objectives:

- To identify urban factors to be promoted and preserved in the target area and the surroundings from a viewpoint of the urban management
- To analyze the character, size and impact of urban factors

Output: Maps of urban factor (promotion, preservation and public facility)

Consideration:

- Urban factors are categorized into 3 major factors of promotion, preservation and public facility.
- The identifying and analyzing are separately worked on each category in order to clarify

Table 1 Example of Identify and Analyze Urban Factors

Promotion Factor		Map
Type	Factors	
Transport corridor	<ul style="list-style-type: none"> Lane Xang str. and Kaysone Phomvihane str. Samsenthai str. and Tha Deua str. Kampheng Meuang str. (future) BRT (future) Bus network 	
Transport core	<ul style="list-style-type: none"> Wattay Airport Talat Sao Bus Terminal WTC New Bus Terminal (future) 	
Commercial and business core	<ul style="list-style-type: none"> Talat Sao and the surroundings Administration and business area along lane Xang str. 	
Tourism place	<ul style="list-style-type: none"> Historic Area (ZPP-UA) That Luan Area Patu Xay Hotel Area along the Mekong River 	
Urban development	<ul style="list-style-type: none"> Nong Ping AREA That Luang Area 	

Preservation Factor		Map
Type	Factors	
Historical site	<ul style="list-style-type: none"> Historic Area (ZPP-UA) That Luan Area Patu Xay Temple and Wat in Inner Zone 	
Administratio n area	<ul style="list-style-type: none"> Administration and business area along lane Xang str. 	
Security and force	<ul style="list-style-type: none"> National Military 	
Residential area	<ul style="list-style-type: none"> Southern area with hospital, international school and embassy 	
Natural resources	<ul style="list-style-type: none"> Mekong river 	

Public Facility		Map
Type	Factors	
Public park	<ul style="list-style-type: none"> Chou Anouvong Park Xaysettha Park Open space with Patu Xay 	
Utility plant	<ul style="list-style-type: none"> N/A 	

STEP 2: Formulate Sub-sector Concept Plans and the Strategies

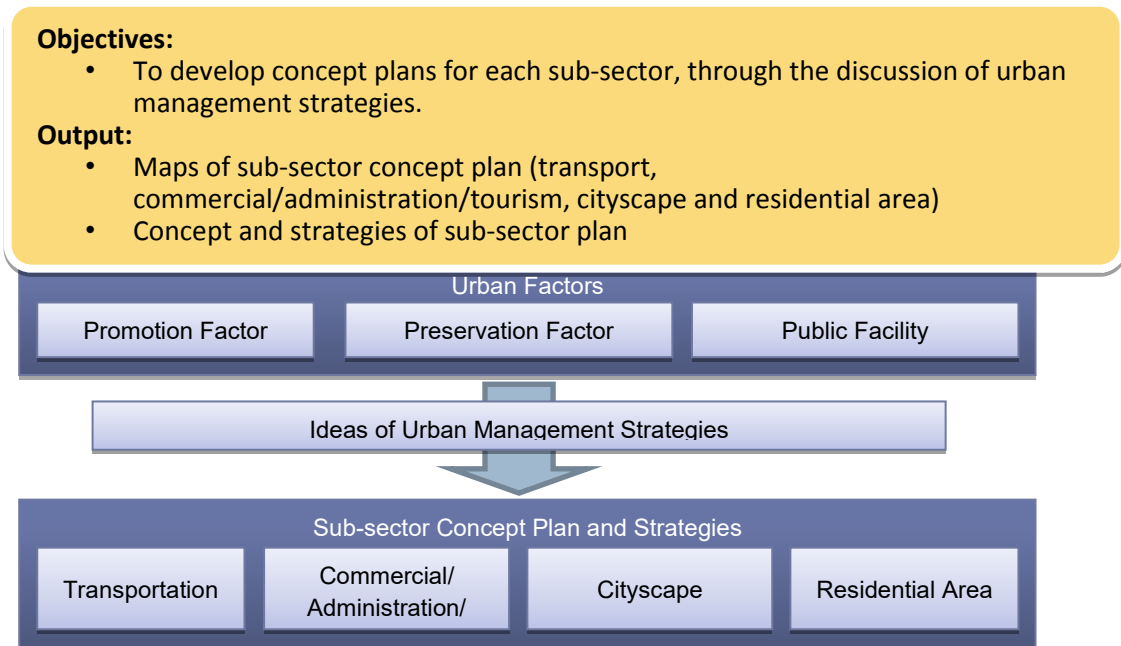


Figure xxx Orientation for Development of Sub-sector Concept plan and the Strategies

Table 2 Example of Idea of Urban Management Strategies

Items		Urban Management Strategies
Promotion Strategies	Development Corridor	<ul style="list-style-type: none"> Provide high-capacity to promote commercial & business and apartment development based on Transit Oriented Development (TOD) concept Rise the profitability of the private development to secure budget for the resettlement and compensation Enforce building setback to secure space for future road widening Enforce building height to create cityscape with continuous skyline
	Commercial and Business core	<ul style="list-style-type: none"> Provide adequate capacity to promote commercial & business development Create the buffer zone between the core and surrounding residential area and administration area from a viewpoint of the traffic impact Enforce building height to create cityscape with continuous skyline Enforce parking regulation
Preservation Strategies	Religious and heritage site	<ul style="list-style-type: none"> Enforce low-rise building in the surroundings to preserve historic cityscape Create low-rise commercial area for the tourism activities
	Administration area	<ul style="list-style-type: none"> Provide adequate capacity to follow current building style Create the buffer zone between the surrounding commercial area from a viewpoint of the security and calmly
	Residential area	<ul style="list-style-type: none"> Provide adequate capacity and land use to preserve living environment Create the buffer zone between the surrounding commercial area from a viewpoint of the traffic impact and calmly
Public Facility Strategies		<ul style="list-style-type: none"> Secure space for road widening by integrated development in development corridor Secure the space for public facility development such as park, school, public service and utility plant

Table 3 Example of Sub-Sector Concept plan and the Strategies

Transportation

Item	Concept and Strategy	Map
Major transport corridor	<ul style="list-style-type: none"> • Serve major traffic passing east-west and north south in Inner Zone • Connect to sub-centers in suburb 	<p>The map, titled 'Concept Plan of Transportation', shows a network of transport routes. Major transport corridors are shown as thick red lines with arrows, connecting the city center to various sub-centers. Sub-transport corridors are shown as orange lines. Bus routes (existing and future) are shown as blue lines, and BRT routes are shown as green lines. Airport bus terminals are marked with blue circles. The map also shows the city's layout, including the river and various zones.</p>
Sub-transport corridor	<ul style="list-style-type: none"> • Support major corridor to serve inner urban traffic 	
Public transport network	<ul style="list-style-type: none"> • Serve public transport service by BRT and bus line • Develop new bus line for southern area 	

Commercial/Administration/Tourism

Item	Concept and Strategy	Map
Center Commercial Area	<ul style="list-style-type: none"> • Center area with Talat Sao and WTC area • Promote private commercial development • Permit high-rise and high-capacity building 	<p>The map, titled 'Concept Plan of Commercial/ Business/ Tourism', shows different commercial and tourism zones. The center commercial area is highlighted in red, the commercial/tourism area in orange, the historical/tourism area in pink, the administration/business area in yellow, and the roadside mixed area in light orange. The map also shows the city's layout, including the river and various zones.</p>
Commercial/ Tourism Area	<ul style="list-style-type: none"> • Luxury hotel area with Don Chan Palace and Landmark Riverside Hotel • Promote private development • Permit high-rise building, bus consider with UCa 	
Historical/ tourism Area	<ul style="list-style-type: none"> • A: High-density historical tourism area • B: Historical tourism area with middle-large scale building • C: Historical tourism area with That Luan • Restrict building height to secure the view of historical building • Control building façade • Restrict large-scale commercial 	
Administration/ Business Area	<ul style="list-style-type: none"> • Administration area along Lane Xang stri. • Restrict large-scale commercial 	
Roadside Mixed Area	<ul style="list-style-type: none"> • Road side mixed use area along major and sub transport corridor • Promote commercial development along major corridor • Promote middle-rise mixed use along sub-corridor 	

Cityscape

Item	Concept and Strategy	Map
Urban Cityscape Corridor	<ul style="list-style-type: none"> • Preserve symbolic city view with Presidential Palace and Patu Xay • Create green corridor between Chou Anouvong Park and Xaysettha Park • Restrict high-rise building • Enforce construction line or setback 	<p>The map shows various cityscape zones: a green corridor (Urban Cityscape Corridor) connecting two parks, a yellow area (Middle-rise Cityscape Area), a light green area (Low-rise Cityscape Area), a pink area (Historical Cityscape Area), green spaces (Green Park), blue dots (Temple), and red dots (Wall). A north arrow and 'Mekong river view' label are also present.</p>
Middle-rise Cityscape Area	<ul style="list-style-type: none"> • Administration area along Lane Xang street. • Preserve Lao-style city view with administrative buildings • Restrict high-rise building • Control building facade 	
Low-rise Cityscape Area	<ul style="list-style-type: none"> • Promote new residential development in cultural and education area • Restrict high-middle rise building • Restrict large scale commercial 	
Historical Cityscape Area	<ul style="list-style-type: none"> • Historic area in ZPP-UA and ZPP-UB (City Wall, That Luang) • Restrict building height to secure the view of historical building • Control building façade, color • Restrict large-scale commercial activity • Advertisement and sign board 	

Residential Area

Item	Concept and Strategy	Map
Ordinary Residential Area	<ul style="list-style-type: none"> • Mixed use and middle-rise residential area • Buffer Zone for exclusive residential area • Restrict high-rise building • Restrict large scale commercial 	<p>The map highlights residential zones: green for Ordinary Residential Area, light green for Exclusive Residential Area (Cultural), orange for Roadside Mixed Area (High/Middle-rise), and purple for Urban Development Areas (Nong Ping and That Luang). A north arrow is included.</p>
Exclusive Residential Area	<ul style="list-style-type: none"> • Promote new residential development in cultural and education area • Restrict high and middle-rise building • Restrict large scale commercial 	
Roadside Mixed Area	<ul style="list-style-type: none"> • Road side mixed use area along major and sub transport corridor • Promote high-rise apartment along major corridor • Promote middle-rise mixed residential along sub-corridor 	

STEP 3: Formulate Future Concept Plan

Objectives:

- To establish overall concept of target area in consideration of the integration of sub-sector plans
- To establish urban management strategies to implement the concept plan

Output:

- Goal, vision and objectives
- Map of integrated concept plan
- Urban management strategies

Table 4 Example of Integrated Concept Plan

Item	Contents	Map of Concept Plan
Goal/Vision	Sustainable Development Center of VTE	
Objective	<ul style="list-style-type: none"> • To create attractiveness as a destination of international tourism • To promote commercial and business activity as a center of Vientiane capital • To improve quality of urban living environment 	
Strategies of Urban Management		
Items	D-LUP and D-ZC	Infrastructure Development and Program
TOD (Transit Oriented Development) with BRT	<ul style="list-style-type: none"> • Allow higher-rise development along BRT • Allow high-rise CBD at the surrounding of BRT station • Change construction line to keep open space and pedestrian space 	<ul style="list-style-type: none"> • Modify alignment to serve development potential area • Develop open space and pedestrian space connecting to BRT station • Private CBD at the surrounding of BRT station • Restrict entering of private vehicle into city center • Restrict road side parking
Roadside Development	<ul style="list-style-type: none"> • Allow high and middle rise development • Change construction line to keep road space 	<ul style="list-style-type: none"> • Road widening to secure road capacity • Road improvement (pavement, pedestrian, green)
Promotion of Tourism Area	<ul style="list-style-type: none"> • Control building height with max.12m • Control building façade 	<ul style="list-style-type: none"> • Renovation of Setta Thirath str as a pedestrian walkway • Road improvement for pedestrian network • Official registration of historical building • Renovation of historical building • Tourist guide with information of historical buildings • New tourism core facility
Cityscape control	<ul style="list-style-type: none"> • Control building height • Restrict construction line • Control building façade • Restrict large-scale commercial development 	<ul style="list-style-type: none"> • Green walk way along Lane Xang str. • Improve road facility (pedestrian, lighting, tree) • Underground electrical conduit

D-LUP Formulation

STEP 4A: Define zone characters

Objectives:

- To define zone characters based on concept plan and the strategies

Output:

- List of zone character and the name of zone

Table 5 Example of Defining of Zone Character

Items in Concept Plan	Character	Zone in D-LUP
Urban Cityscape Corridor	<ul style="list-style-type: none"> • Preserve symbolic city view with historical building • Create green corridor 	(No indicate on D-LUP)
Major Development Corridor	<ul style="list-style-type: none"> • Promote high-rise C&B and apartment building 	High-rise Commercial/Residential Mix-use Zone
Secondary Development Corridor	<ul style="list-style-type: none"> • Promote middle-rise and mixed use building 	Middle-rise Commercial/Residential Mix-use Zone
Pedestrian Corridor	<ul style="list-style-type: none"> • Produce pedestrian network to connect tourism area and public transport 	(No indicate on D-LUP)
Center Commercial Area	<ul style="list-style-type: none"> • Promote high-rise C&B building 	Center Commercial Zone
Tourism/Commercial Area	<ul style="list-style-type: none"> • Promote river side tourism development • Preserve riverside cityscape 	Tourism Zone along Mekong River
Tourism/Historical Area	<ul style="list-style-type: none"> • Preserve historical cityscape • Promote commercial and tourism activities 	Tourism/Historical Zone
Administration/business Area	<ul style="list-style-type: none"> • Preserve historical cityscape and administration area 	Administration and Business Zone
Middle-rise and Mixed Use Residential Area	<ul style="list-style-type: none"> • Promote Middle-rise and mixed use residential area 	Middle-rise Residential Zone
Middle and Low-rise and Mixed Use Residential Area	<ul style="list-style-type: none"> • Promote Middle and Low-rise and mixed use residential area 	Middle and Low-rise Residential Zone
Historic Site	<ul style="list-style-type: none"> • Preserve historical building and historical view 	Historic Site
Transport Core	<ul style="list-style-type: none"> • Promote bus terminal development 	(No indicate on D-LUP)
Green/park	<ul style="list-style-type: none"> • Preserve green and park area 	Public Facility

STEP 5A: Sub Zone

Objectives:

- To sub-divide target area into new zone based on concept plan and zone characters

Output:

- Map of draft detail land use plan

Consideration:

- Work based on formulated concept plan
- Zone boundaries should follow existing structure such as road and canal.
- Secure adequate zone depth for road side zone (see reference A)
- Consider zone boundaries of General Land Use Plan

STEP 6A: Develop D-LUP

Objectives:

- To adjust boundaries of each zone and add specific area based on draft detail zoning code
- To decide abbreviated names of zone
- To finalize a map of D-LUP and develop small maps of each zone to attach the regulation

Output:

- Map of detail land use plan

No.	Name of Zone	Symbol
1	Center Commercial Zone	C-1
2	Administration and Business Zone	C-2
4	High-rise Commercial/Residential Mix-use Zone	M-1
5	Middle-rise Commercial/Residential Mix-use Zone	M-2
6	Middle-rise Residential Zone	R-1
7	Low-rise Residential Zone	R-2
8	Center Commercial Zone	NE-1

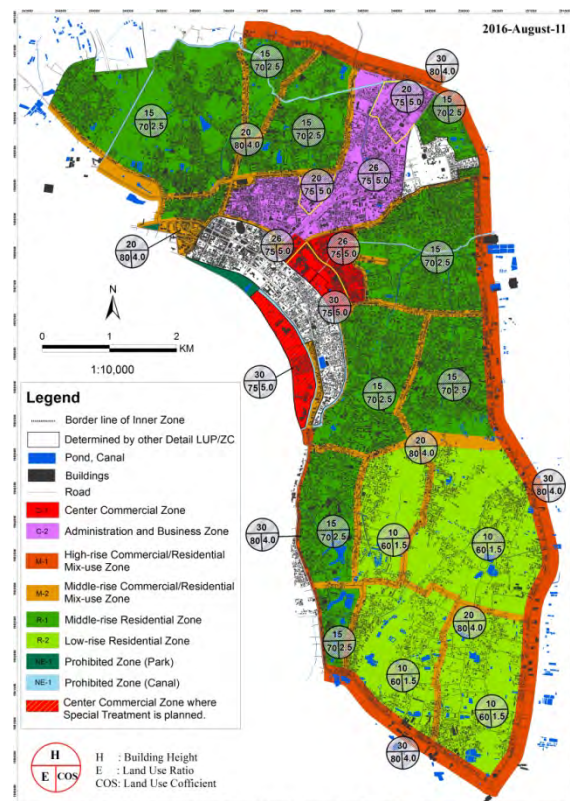
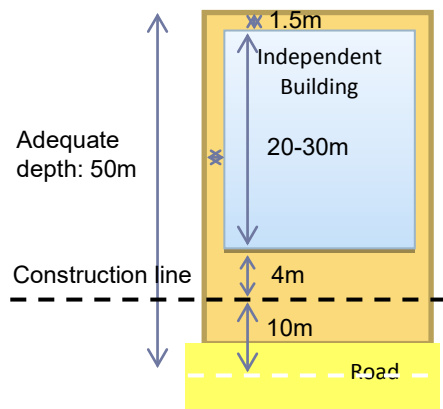


Figure 1 Example of D-LUP

Reference A: Adequate Zone Depth of Road Side Zones

- Adequate depth of site for road side land use such as row houses, apartment, office and commercial: 50m
- In case that there are existing large-scale sites: 100m

Adequate depth of road side land use



Example of Depth of Road Side Zone

Zone	Street	Depth
UB-RS1	• Khamphengmeuang str. (T4)	100m
	• Thadeua str.(southern part)	50m
UB-RS2	• New road (connecting to That Luang area)	100m
	• Others	50m

Example of existing road side land uses



D-ZC Formulation

STEP 4B: Examine Building Use Control

Objectives:

- To define type of building use which can be constructed and prohibited in each zone based on zone character and urban management strategies
- To define special condition for building use which can be constructed by the condition

Output:

- Table of building use control

Table 6 Example of Building Use Control

1. In Sub-Zones shown in the table below, land use must comply with followings.

R	R-1 (Middle-rise Residential Zone), and R-2 (Low-rise Residential Zone)
C	C-1 (Center Commercial Zone), and C-2 (Administration and Business zone)
M	M-1 (High-rise Commercial/Residential Mix-use Zone), and M-2 (Middle-rise Commercial/Residential Mix-use Zone)
I	I (Industrial Zone)

(1) Land use coming under any use shown with “X” in the Table (1) are prohibited.
 (2) Factories coming under any use shown with “X” in the Table (2) are prohibited.
 (3) Facilities to keep hazardous materials over limitation shown in the Table (3) are prohibited.

2. In P (Prohibited Zone (Public PreservationZone)), only public use of land is allowed. And structures other than below must not be constructed.

(a) Structures, which are operated by the Government organization that has responsibility on the area, and
 (b) structures, for which the above agency issued permission.

3. In case of slaughter houses, waste disposal plants, or waste incinerating plans, each location must be agreed by the Construction Management Committee.

Land use		Land Use Zones						
		R		C		M		I
		R2	R1	AB	CC	M2	M1	
(1) Residential building (aa-khaan thii yuu aa-sai) (2) Hotel, Guesthouse (3) Religious building (Temple, Church, Mosque, etc.) (4) Hospital, Clinic (5) Car parking (6) Public park, Garden								
(7) Educational building	Secondary school, Primary school, Nursery							
	University, College, Vocational school, High school	X	X					X
(8) Gas station		X	X					
(9) Customers floor of: Shop (sales or services) or Restaurant, Entertainment facilities, Public hall (saa muu soong)	B, F1							
	F2	X	X					
	≥ F3	X	X					X
(10) Other than (1) to (9), such as offices, museum, stadium/gymnasium, bus station, etc.	B, F1							
	F2	X						
	≥ F3	X	X			X		

“X” means “Not allowed.” “B” means floor of basement. “F1”, “F2” and “F3” mean First floor, Second floor and Third floor.

Factories using motors (control on total floor area of workshop)

Land use		R	C	M	I
Automobile repair shops	exceeding 150 m2 in total floor area of workshop	X			
	exceeding 300 m2 in total floor area of workshop	X	X		
Factories other than above	exceeding 50 m2 in total floor area of workshop	X			
	exceeding 150 m2 in total floor area of workshop	X	X		

Factories of foods or medicine

Land use		R	C	M	I
Manufacture of fish paste using motors		X			
Milling using motors exceeding 2.5 kW in total output		X			
Manufacture of medical supplies from materials of internal organs or excrement of animals		X	X	X	

Factories of metal forming

Land use		R	C	M	I
Hammer processing of metal boards 0.5 mm or more in thickness <Exception> Processing for the purpose of manufacturing metal crafted goods		X			
Press of metal using motors <Exception> Hydraulic press operations using a straightening press		X			
Shearing of metal using motors(Part of G4-2)		X			
Processing of wire, using a wire forming machine with a motor exceeding 0.75 kW in total output		X			
Cutting or shaving of metal , using motors exceeding 10 kW in total output		X			
Processing of metal, using bending machines (limited to roll type)		X			
Processing of metal, using tumblers		X			
Metal work using acetylene gas	using dissolved acetylene gas				
	using acetylene gas generators of 10 L or less in capacity				
	using acetylene gas generators from 10 L to 30 L in capacity	X			
	other than above	X	X		
Dry polishing of metal by using polishing machines run by motors <Exception> Polishing of tools and implements		X			
Metal spraying or sand blasting		X	X		

Land use		R	C	M	I
Corrugation of iron board		X	X		
Metal melting or refining	Casting of types <Exception> That at printing office	X	X		
	Casting of metal for art goods	X	X		
	using crucibles or furnaces not exceeding 50 L in total capacity	X	X		
	other than above	X	X	X	
Work using motors, of thick metal plates or shapes (1) Cutting work <Exception> Case of using grinders (2) Rivet work (3) Drilling work		X	X	X	
Manufacture of iron nails or steel balls		X	X	X	
Wire drawing, tube drawing or metal rolling	using motors 4 kW or less in total output	X	X		
	other than above	X	X	X	
Forging of metal , using forging machines	using spring hammers	X	X		
	using swaging or rolling machines	X	X		
	other than above	X	X	X	

Chemical factories

Land use	R	C	M	I
Manufacture of ink for printing	X			
Manufacture of cement goods , using motors	X			
Injection molding process of synthetic resins	X			
Metal plating	X			
Work using a roller which uses rubber or synthetic resin <Exception> Work using a calendar roller	X			
Dry cleaning or dry dyeing , using inflammable solvents	X	X		
Heat drying of paint or baking of paint <Exception> Cases using infrared rays	X	X		
Heat treating of celluloid or saw-machine processing of celluloid	X	X		
Manufacture of paints or water paints	X	X		
Manufacture of viscose products, or acetate products	X	X	X	
Manufacture of cuprammonium rayon products <Exception> Those which do not use liquefied ammonia gas or aqueous ammonia with a concentration exceeding 30 percent	X	X	X	
Manufacture of synthetic dyestuffs or their intermediate products, pigments or paints <Exception> Manufacture of lacquer or water paints	X	X	X	
Manufacture of rubber products or aromatic oils , using inflammable solvents	X	X	X	

	R	C	M	I
Manufacture of imitation-leather paper/cloth or water-proof paper/cloth, using drying oils or inflammable solvents	X	X	X	
Manufacture of chlorine , bromine, iodine, sulfur, sulfur chloride, hydrofluoric acid, hydrochloric acid, nitric acid , sulfuric acid , phosphoric acid, caustic potash, caustic soda , ammonia water, potassium carbonate, washing soda, soda ash, bleaching powder, bismuth subnitrate, sulfites, thiosulfates, arsenic compounds, lead compounds, barium compounds, copper compounds, mercury compounds, cyanogen compounds, chlor sulfuratic acid, chloroform, carbon tetrachloride, formalin, sulphonal, glycerin, ammoniumichthyol sulfonate, acetic acid, carbolic acid, benzoic acid, tannic acid, acetanilide, aspirin or guaiacol	X	X	X	
Manufacture of products by hydrolysis of protein	X	X	X	
Collection, hardening or heating work of oils and fats <Exception> Manufacture of toilet articles	X	X	X	
Manufacture of factice, synthetic resin , or synthetic rubber	X	X	X	
Manufacture of synthetic fibers <Exception> Those which use raw materials or manufacturing processes which have no objection from the viewpoint of safety and fire-prevention	X	X	X	
Manufacture of fertilizer	X	X	X	
Refining of asphalt	X	X	X	
Manufacture using such materials as asphalt , coal tar, wood tar, petroleum distillates or their residues	X	X	X	

Factories of hazardous material

Land use		R	C	M	I
Manufacture of explosives	Manufacture of toy fireworks	X	X		
	other than above	X	X	X	
Manufacture of dangerous chemical substances as followings: (1) oxidizing solids, such as chlorates and dichromates (2) combustible solids, such as phosphorus sulfide, sulfur, and magnesium (3) spontaneously combustible substances and water-reactive substances, such as potassium and sodium (4) inflammable liquids, such as petroleums, alcohols, and oil extracted from animals and plants (5) self-reactive substances, such as nitro compounds and azo compounds (6) oxidizing liquids, such as hydrogen peroxide and nitric acid		X	X	X	
Manufacture of matches		X	X	X	
Manufacture of nitrocellulose products		X	X	X	
Manufacture of activated carbon from wood <Exception> manufacture using vapor method		X	X	X	
Manufacture of coal gases or coke		X	X	X	
Manufacture of flammable gases <Exception> Manufacture of acetylene gas		X	X	X	

Factories other than above

Land use		R	C	M	I
Grinding or dry polishing of cork, ebonite or synthetic resin or grinding of wood, using motors		X			
Sawing or planing of lumber , sewing, machine weaving, stranding of thread for weaving machines, braid making, knitting, bag making or filing of saws, using motors exceeding 0.75 kW in total output		X			
Making of needles or cutting of stone , using motors exceeding 1.5 kW in total output		X			
Work using air compressors with motors exceeding 1.5 kW in total output <Exception> Those, which have effective sound blocking performance, using a motor no greater than 7.5 kW in total output		X			
Spraying of paints using motors	using motors 0.75 kW or less in total output	X			
	other than above	X	X		
Bleaching , etc. (1) Bleaching, using sulfurous acid gas (2) Washing, dyeing or bleaching of feathers or hair (3) Disinfection, selection, washing or bleaching, of rag, waste cotton, waste paper, waste yarn, waste fur or the like		X	X		
Manufacture of bone charcoal or other animal charcoal		X	X		
Manufacture of soap		X	X		
Manufacture of fish powder or feather-meal, bone and meat powder, meat powder, or blood powder, or feeds containing any of the above		X	X		
Manufacture of cotton , remanufacture of old cotton, nap raising, wool shearing, manufacture of reclaimed wool, or felt, using motors		X	X		

Land use		R	C	M	I
Sawing or dry polishing of bone, horn, tusks, hooves or shell, using motors		X	X		
Pulverizing of mineral, rock, sand, concrete, asphalt-concrete, sulfur, metal, glass, brick, pottery or porcelain, bone or shells, using motors		X	X		
Manufacture of ready-mixed concrete or filling bags with cement, using motors exceeding 2.5 kW in total output		X	X		
Manufacture of india-ink or briquette		X	X		
Manufacture of tile, brick, earthenware, pottery or porcelain, artificial whetstone, crucibles or enameled ironware		X	X		
Manufacture or sand blasting of glass		X	X		
Washing or remanufacture of drum containers		X	X		
Manufacture of paper	Manufacture of hand-laid paper	X	X		
	other than above	X	X	X	
Manufacture of pulp		X	X	X	
Manufacture of leather or glue, or refining of fur or bone		X	X	X	
Manufacture of cement, gypsum, hydrated lime, quick lime or carbide		X	X	X	
Manufacture of carbon or graphite products with carbon powder, or pulverizing of graphite		X	X	X	
Manufacture or pulverization of products containing asbestos <Exception> Those, which use dust collectors and other prevention methods that they are effective against dispersion of asbestos dust		X	X	X	

Hazardous materials

Hazardous materials		Limit in each Land Use Zone			
		R	C	M	I
Explosives (excluding toy fireworks)	Gunpowder	20 kg	50 kg	20 t	NL
	Blasting powder	0 (Prohibited)	25 kg	10 t	NL
	Ball cartridge and blank cartridge	2,000 pcs.	30,000 pcs.	10 X 10 ⁶ pcs.	NL
Combustible gas (*1)		35 m ³	70 m ³	350 m ³	NL
Compressed gas (*1)		350 m ³	700 m ³	3,500 m ³	NL
Liquefied gas		3.5 t	7 t	35 t	NL
Class 1 Petroleum, such as Gasoline, etc. (*2)		100 L	200 L	1,000 L	NL
Class 2 Petroleum, such as Kerosene, light oil, etc. (*2)		500 L	1,000 L	5,000 L	NL
Class 3 Petroleum, such as Heavy oil, etc. (*2)		1,000 L	2,000 L	10,000 L	NL
Class 4 Petroleum, such as Cylinder oil, etc. (*2)		3,000 L	6,000 L	30,000 L	NL

<Note>

"NL" means "No Limit". (Hazardous materials must be kept in a safe manner in compliance with regulation, even if there are no limitation in amount.)

(*1) Values are assumed under the conditions at 0°C and 760 mmHg.

(*2) These requirement are not applied, in case where materials are stored in an underground storage tanks.

STEP 5B: Examine Building Size Control (E, COS, Height)

Objectives:

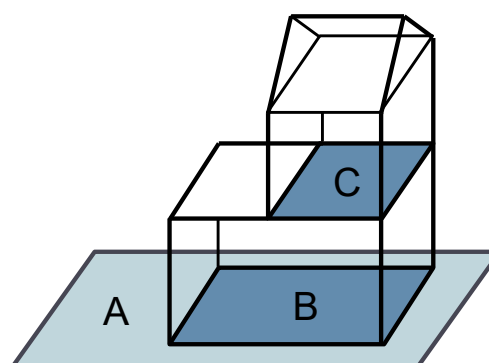
- To define three indicators such as Building height (H), Land use ratio (E) and Land use coefficient (COS) for each zone and specific area

Output:

- Table of building size control

Definition and Objective of E, COS, Height

Items	Definition	Objective	Target Area
E (Land Use Ratio)	$E (\%) = \text{Building Area (B)} / \text{Site Area (A)} \times 100$	To conserve urban environment in terms of sunshine, ventilation and disaster prevention such as fire	High E <ul style="list-style-type: none"> Fire prevention area with RC buildings Density area with small-size land use Low E <ul style="list-style-type: none"> Exclusive residential area Wooden houses area
COS (Land Use Coefficient)	$COS = \text{Total Floor Area (F)} / \text{Site Area (A)}$	To control a balance between building volume and capacity of public infrastructure (road, utility), and to control development potential and land use value	High COS <ul style="list-style-type: none"> Urban area with adequate technical infrastructure (road, utility) High-development potential area Low COS <ul style="list-style-type: none"> Area with low-capacity of technical infrastructure Low-development potential area
Height (Building Height)	H (m) = Building Height (H) (Please refer 7.2 important definition for height measure)	To conserve urban environment in terms of sunshine, ventilation and cityscape	High <ul style="list-style-type: none"> High-rise landmark development Center area Road side area Low <ul style="list-style-type: none"> Residential area Historic area



Total Floor Area (F) = B + C

Table 7 Example of Building Use Control (Value of H, E, and COS)

Sub-Zones		H	E	COS
C-1	Center Commercial Zone	30m / 26m	75%	5.0
C-2	Administration and Business Zone	26m / 20m	75%	5.0
M-1	High-rise Commercial/Residential Mix-use Zone	30m	80%	4.0
M-2	Middle-rise Commercial/Residential Mix-use Zone	20m	80%	4.0
R-1	Middle-rise Residential Zone	15m	70%	2.5
R-2	Low-rise Residential Zone	10m	60%	1.5

STEP 6B: Examine Other Codes

Objectives:

- To Examine specific code for each zone in consideration of the zone character and standard of the specific code

Output:

- Table of specific code for each zone

Table 8 Sample of Standard for Other Code

Subject		Item	Row house	Independent building
Width touching the road		Item 5	Width \geq 4 m	Width \geq 4 m (*)
Site area (excluding reservation area)		Item 5	Site area \geq 48 m ²	Site area \geq 140 m ²
Distance from the next site		Item 6	No requirements	Distance \geq 2 m
Distance from the back site		Item 6	Distance \geq 2 m	
External wall facing the road	Distance from the construction line	Item 8	No requirements	Distance \geq 4 m
	Parallel	Item 8	Parallel to the construction line	No requirements
Level of the first floor		Item 9	Height of the first floor \leq 0.3 m	No requirements

(*) In case that the building site is touching the road with its narrow part longer than 50 m, width of the narrow part \geq 6 m.

Means items, which are severer than that of the another type of building.

STEP 7B: Formulate D-ZC

Objectives:

- To formulate detail zoning code based on the examined contents

Output:

- Detail Zoning Code (Application of 15 Items)
- Detail maps of each zone to be attached the regulation

Table 9 Application of 15 items for Zoning Code

Items
1. Development/Preservation Policy of the Zone
2. Land Use
3. Technical Network
4. Road and Gateway
5. Characteristic of Site
6. Distance from Site Boundary
7. Distance among Buildings in a Site
8. "Road and Reservation Area" and Structure
9. Building Height (H)
10. Land Use Ratio (E)
11. Land Use Coefficient (COS)
12. External Feature
13. Parking lot
14. Vacant Space and Tree Planting
15. Special Treatment

4 BUILDING SURVEY

4.1 Objective

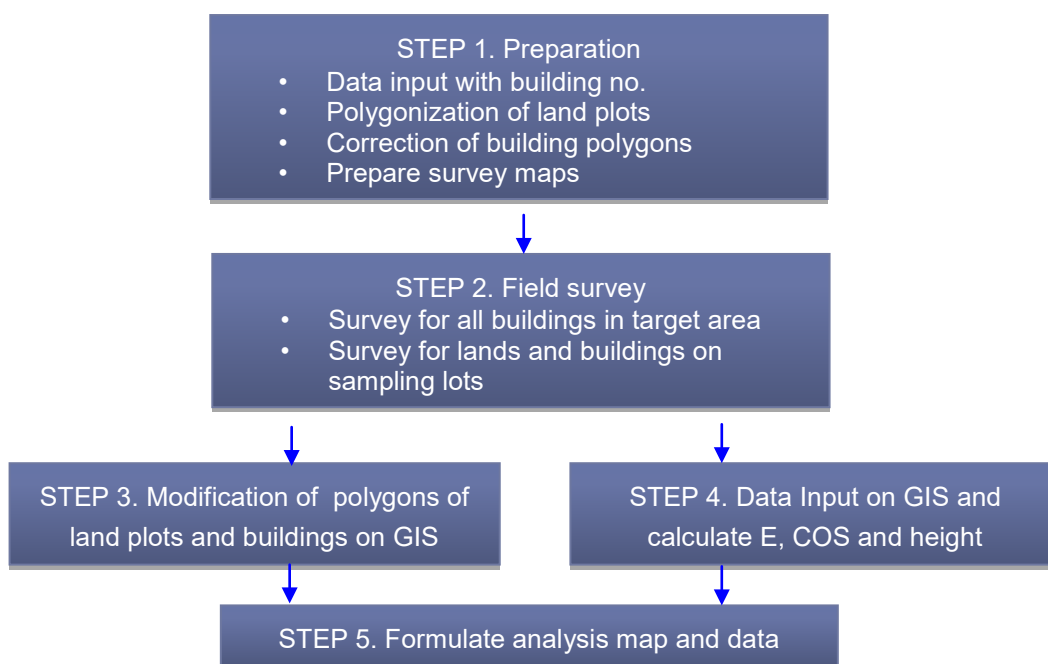
Objective:

To confirm current land use and building size (E, COS, Height) in Inner Zone to appraise proposed regulations of draft D-LUP and D-ZC

Survey Components:

- 1) Survey of land use and building size (E, COS, Height)
 - Targeting on typical areas of each zones
- 2) Survey of building height
 - Targeting on road side area and urban development area, where high-rise buildings are existing

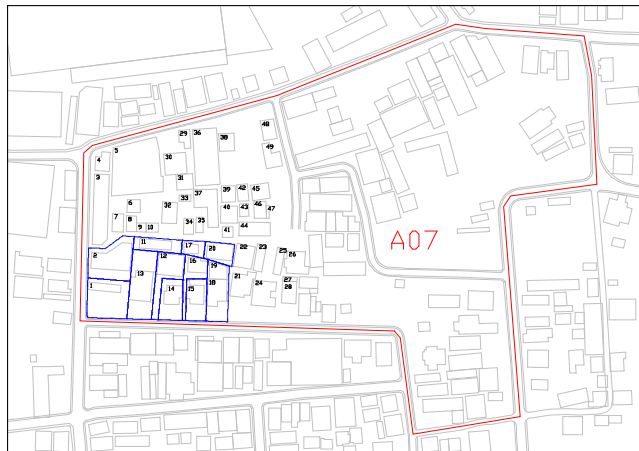
4.2 Work Flow



STEP1. Preparation

1-1 GIS Work

- **Data input with building no.:**
Input number for all building polygons in target area
- **Polygonization of sampling land plots:** Create polygons for land plot which cover 20% of the target area
- Input number for land polygons
- **Correction of building polygons:**
Check and revise current building polygons, especially in sampling land plot, to meet existing building on satellite image and google earth as detail as possible.



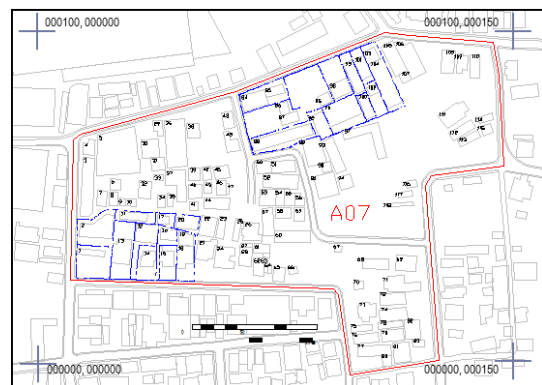
1-2 Prepare survey maps

Develop 2 types of survey map for each target area (Map scale: 1/1,000 on satellite image and white base with coordinate)

Survey map on satellite image



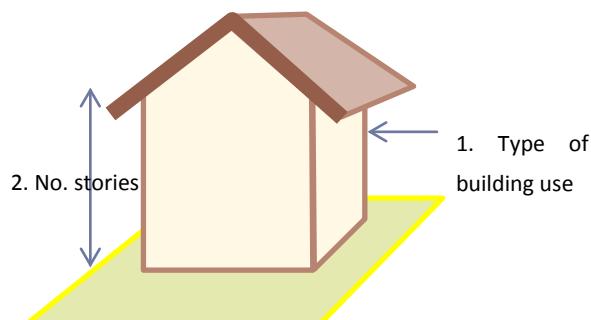
Survey map on white base



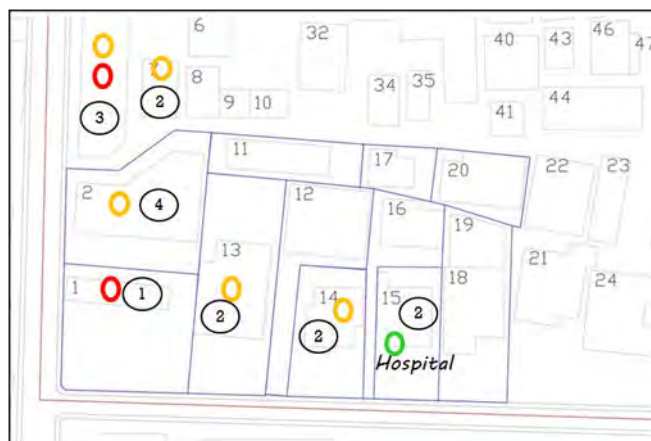
STEP2. Field Survey

2-1. Survey for All buildings in target area

- **Target of survey**

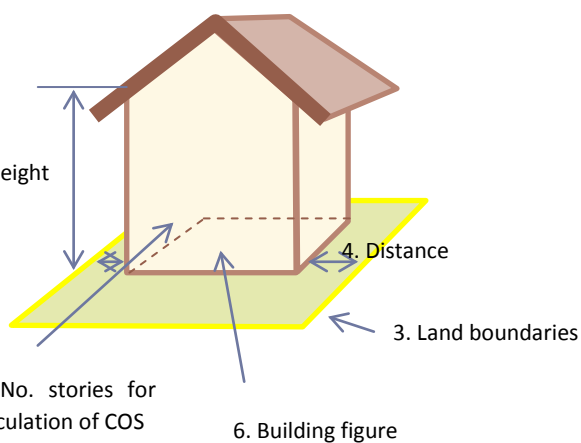


- **Check the type of building use:** Draw color and other use on the map
 - Residence
 - Commercial (shop, office, restaurant, etc.)
 - In case of other use, write down the concrete type of use (temple, hospital, governmental office, primary school etc.)
- **Check the number of stories:** Draw the number with circle line on the map



2-2. Survey for lands and buildings on sampling lots (20% of target area)

- Target of survey
 - 1. Height
 - 2. No. stories for calculation of COS
 - 3. Land boundaries
 - 4. Distance
 - 6. Building figure

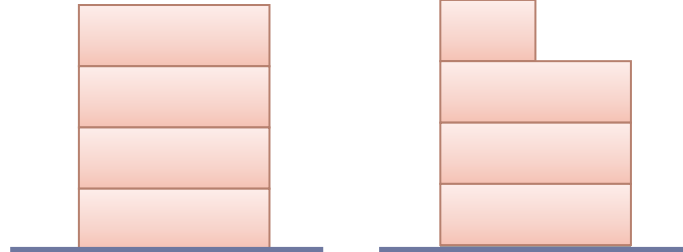


- **Measure the bu**
- **Measure the building height by laser meter:** Write the height on the map



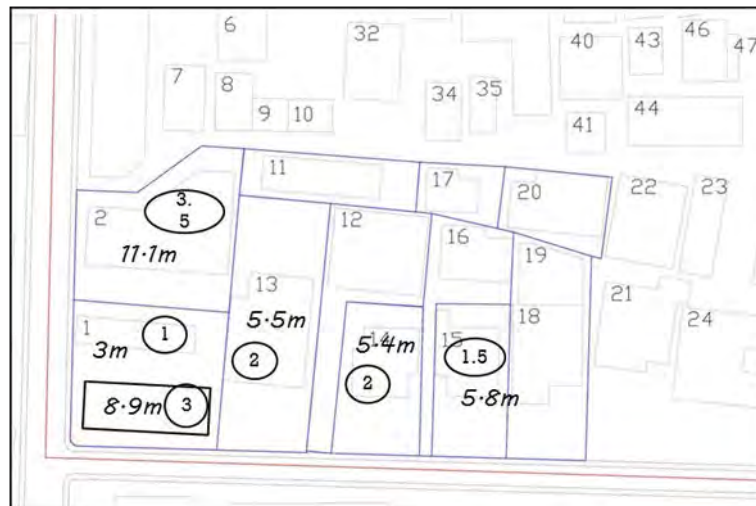
- **Check the no. of stories for calculation of COS:** Write the number with circle line on the map

Example:



No. of stories: 4
No. of stories for COS: 4

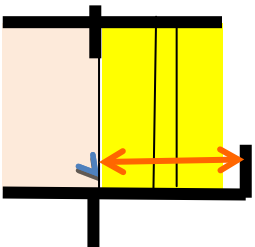
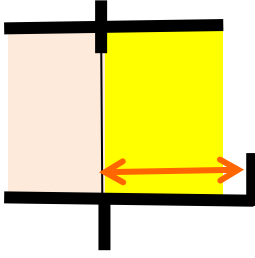
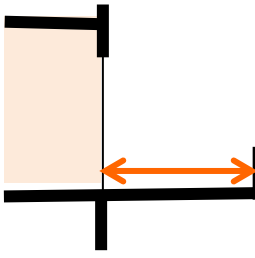
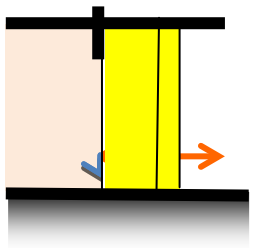
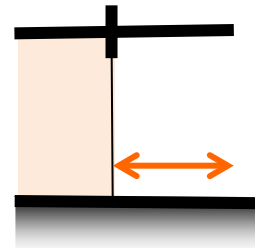
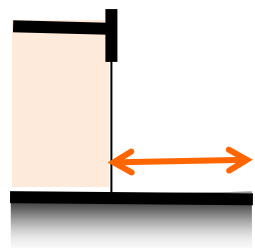
No. of stories: 4
No. of stories for COS: 3.5



- **Draw correct building figure and new building**
- **Draw correct land boundaries**
- **Write down the distance between land boundaries and building wall, measured by eyesight or laser meter**
- Record coordinates points of buildings and land boundaries by GPS



Reference: Measurement of terrace, balcony, etc. in Floor Area in Field survey

	(1) Floor (Red line) with roof and column or side wall	(2) Floor (Red line) with roof and no columns and side walls	(3) Terrace (red line) without roof	Remark
The second floor or more				Counting is regardless of existence of columns or sidewalls.
The first floor				A part of floor with no columns and side walls is not counted.

<Exception>

In case where a part comes under conditions below, the area of the part is not counted in "Floor area".

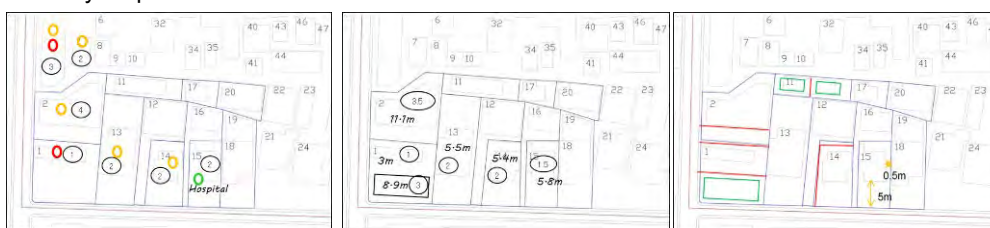
- Its structural elements, including wall, beam, column and roof, are constructed with thin structural elements. (light materials)
- More than half of the total length of its external edge is open to the air.
- The part is single story.

STEP 3. Modification of polygons of land plots and buildings on GIS

STEP 4. Develop data base and calculate E, COS and height

STEP 5. Formulate analysis map and dat

Survey maps



GPS data



Scan and import



1. Location adjustment of scanned maps
2. Modify polygons and data input on GIS
3. Calculate E, COS and height
4. Confirm E, COS, height and building use which is not allowed by draft D-ZC, and input the indicator
5. Develop analysis map
 - Building maps (E, COS, Height, Usage) with colored categorizes
 - Building which is not allowed by draft D-ZC

5 Public Consultation (Strategic Environmental Assessment SEA)

5.1 Introduction of SEA

SEA is an analytical and participatory approaches aiming to integrate environmental considerations into policies, plans and programs and evaluate the inter linkage with economic and social considerations which is composed of:

- assessing social and environment of policies, plans and program, and
- Integrating stakeholder comments through SHM.

Unlike EIA, which is conducted for a specific project, SEA is conducted for policy, plan and program level. Distinction between SEA and EIA is illustrated in the Figure below.

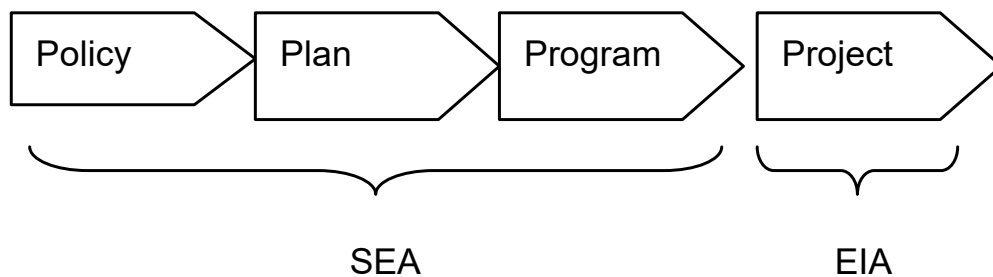


Figure 2 Distinction between SEA and EIA

Coverage and purpose of SEA are summarized in the table below

Table 10 Coverage and Purpose of SEA for G-LUP/G-ZC and D-LUP/D-ZC Preparation

Item	Contents
Coverage of SEA	<ul style="list-style-type: none"> ■ Country policy/strategy ■ Sector policy/strategy: <u>G-LUP/G-ZC, D-LUP/D-ZC is included in policy and strategy</u> ■ Regional development plan ■ Large-scale infrastructure project ■ Assistance strategy (for donors)
Purpose of SEA	<ul style="list-style-type: none"> ■ To assess the impacts and effects on environmental, social and economic matters to be caused by the plans under formulation ■ To disseminate information to stakeholders and receive inputs from stakeholders

SEA should be executed based on following procedure. Procedure can be changed depending on the importance of the target policy/plan/program.

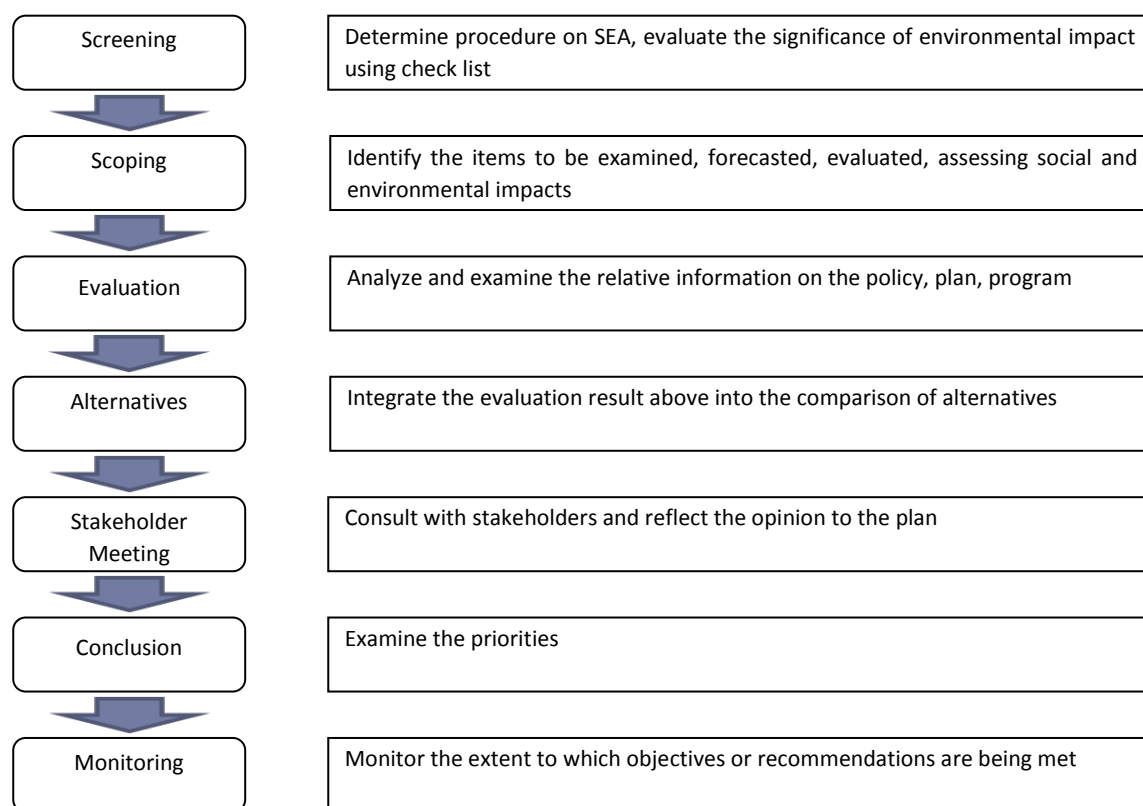


Figure 3 SEA Implementation Procedure

Impact is assessed for (1) human health and safety, natural environment, and (2) social impact. Specific items shall be examined for the type of the plan. Items can be added or omitted depending on the characteristic of the plan

Table 11 Impact Assessment in SEA

Fields	Items
(1) Human health and safety as well as the natural environment	air, water, soil, waste, accidents, water usage, climate change, ecosystems, fauna and flora, including trans-boundary or global scale impacts
(2) Social impacts	migration of population including involuntary resettlement, local economy such as employment and livelihood ,utilization of land and local resources, social institutions such as social capital and local decision-making systems, existing social infrastructures and services, vulnerable social groups such as poor and indigenous peoples , equality in distribution of benefits and losses and in the development process, gender, children’s rights, cultural heritage, local conflicts of interest

5.2 Procedure of Stakeholder Meeting (SHM)

Purpose:

- To assess the impacts and effects on environmental, social and economic matters to be caused by the plans under formulation
- To disseminate formulation of urban plans to stakeholders
- To reach consensus on the plans among stakeholders
-

Methodology:

- To review current situation of environmental, social and economic matters of the target area
- To explain and discuss alternative plans and relevant issues through SHM
- To formulate plans in accordance with the discussion result of the SHM.

SHM is composed of a cycle of (1) preparation, (2) implementation, and (3) follow up as shown in the table below.

Table 12 SHM Implementation Cycle

Flow	Explanation
(1) Preparation	Things to be decided: <ul style="list-style-type: none"> • Topic • Date • Venue (including layout for presentation and discussion) • Agenda • Participants: <ul style="list-style-type: none"> ➤ related government organizations ➤ local authorities ➤ private sector organizations ➤ representatives of community (2nd and 3rd stakeholder meetings) • Role sharing: facilitator, presenter, reception, MC <u>Points of preparation</u> <ul style="list-style-type: none"> • Those who are involved should understand the contents of the plan, discussion topic, and expected output.
(2) Implementation	Implement as plan (details are described in other sections)
(3) Follow up	<ul style="list-style-type: none"> • Compiling comments • Integrate comments into the target plans • Disseminate the SHM results to stakeholders • Prepare for next SHM

SHM is conducted three times during the plan formulation as shown in the table below.

Table 13 Three SHM Implementation

SHM	Explanation
SHM (1)	Objective: To inform the plan formulation, enhance understanding of SEA Contents: <ul style="list-style-type: none"> • Introduction of the plan: objective, contents, schedule • Introduction of SEA
SHM (2)	Objective: To discuss plan contents and to discuss social and environmental impact of the plan Contents: <ul style="list-style-type: none"> • Alternatives of the plan • Impact analysis
SHM (3)	Objective: To disseminate the result of SEA, integration of the comments to the plans, and draft plan Contents: <ul style="list-style-type: none"> • Dissemination of the results of SHM • Dissemination of draft plan

Typical agenda includes (1) opening, (2) remarks from related organizations, (3) explanation, (4) discussion, (5) conclusion as shown in the table below.

Table 14 SHM Sample Agenda

Agenda	Explanation
(1)Introduction/Opening	Introduction or opening by the owner of the target plan: <ul style="list-style-type: none"> • High ranking officials who are responsible for the plan • Explanation of the purpose and expected outcome of the SHM
(2) Remarks (if necessary)	If there is another important organizations which are related to the plan , remarks should be provided from those organizations
(3) Explanation of Contents (target policy, program, plan)	<ul style="list-style-type: none"> • Introduction of the plan and contents • Points to be discussed • Expected outcome from SHM
(4) Discussion	<ul style="list-style-type: none"> • Explanation of discussion method and expected outcome • Discussion • Presentation of discussion results • Comments to the results
(5) Conclusion	<ul style="list-style-type: none"> • Summary of SHM (presentation, discussion) • Confirming the comments and decision if there is • Follow up of SHM (next SHM and next action)

In order for efficient discussion, types of discussion, facilitation, and equipment have to be examined

Table 15 SHM Sample Agenda

Important Points	Explanation
Types of discussion	<p><u>Question and answer</u> is effective if simply asking opinion from participants and number of participants are not large (up to 30 participants)</p> <p><u>Group discussion</u> is effective if details have to be discussed. Number of each group should be 10 to 15.</p>
Flow of discussion	<ul style="list-style-type: none"> ■ Repeating the purpose and expected outcome of the discussion. ■ Providing specific topics to be discussed. ■ Guide the discussion which connects to expected outcome if discussion is lost. ■ Select the leader who can facilitate and make presentation if group discussion is selected.
Role of Facilitation	<ul style="list-style-type: none"> ■ Facilitator should understand the contents of the plan and expected outcome. ■ Facilitator should guide the discussion which leads to the expected outcome by providing information and asking questions to participants
Equipment useful	<ul style="list-style-type: none"> ■ Paper and pen <ul style="list-style-type: none"> ➤ Issues to be discussed should be printed in the paper to be filled ■ Flip board

6 Abbreviation and Important Definition

6.1 Abbreviation

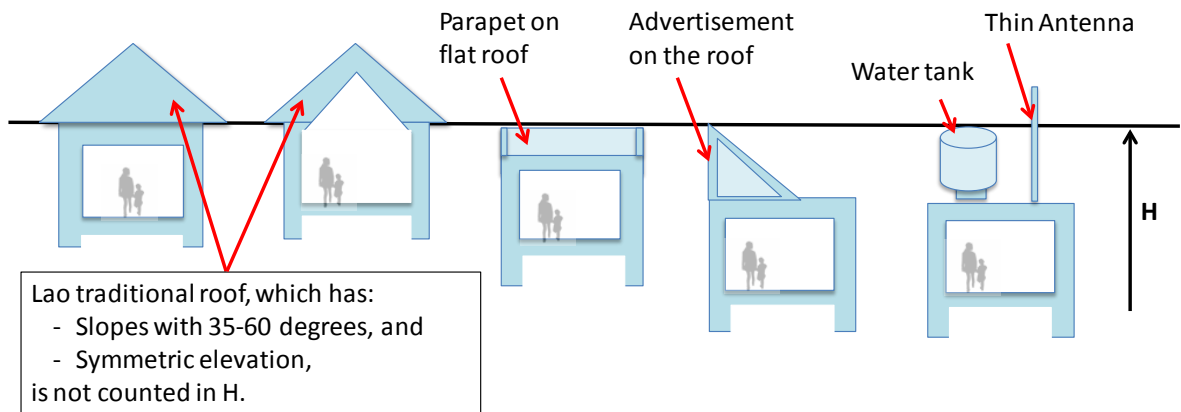
	Meaning	Explanation/Remark
LUZ	Land Use Zone	such as Residential Zone and Commercial Zone.
LUP	Land Use Plan	Land Use Plan a map: <ul style="list-style-type: none"> - showing allocation of various Land Use Zones, and - indicating some values, such as allowable building height.
ZC	Zoning Code	a set of building regulations from the viewpoint of city planning.
H	Building Height	Zoning Code a set of building regulations from the viewpoint of city planning, including regulations to control: <ul style="list-style-type: none"> - building use, - building height, - set back from the road, - external feature of buildings, - etc.
E	Land Use Ratio	Floor area of the ground floor. It is similar with BCR (Building Coverage Ratio), but a little bit different.
COS	Land Use Coefficient	Same with FAR (Floor Area Ratio).

6.2 Important Definition Selected from 15 Items

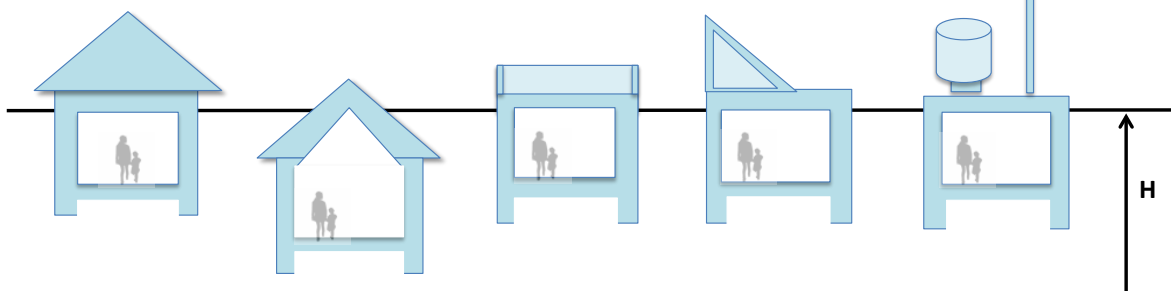
(Article 7) 4. "Building Height"

1. "Building Height" shall be measured as below.
- from the "road level", which the site faces.
 - to the top of the external form of the structure:
 - (a) Including:
 - (i) parapet,
 - (ii) advertisement board and the like (paai khoo-sanaa le aeun-aeun thii mii luk sanaa khai khuu khan),
 - (iii) equipment on the roof (such as water tank), and
 - (iv) the like.
 - (b) Excluding:
 - (i) Lao traditional roof, which has:
 - Slopes with 30-60 degrees, and
 - Symmetric elevation,
 - (ii) Lao traditional roof decoration,
 - (iii) thin antenna and the like.
- <Remark>
In case where there is a floor in space of roof, the Lao traditional roof shall be counted in building height.

Upper edge of "Building Height"

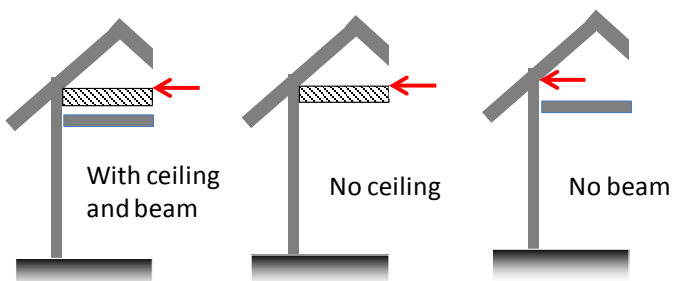


Reference (Regulation 2007 - to the ceiling of the top story -)



Upper edge of “Building Height” in case of installing Lao Traditional Roof

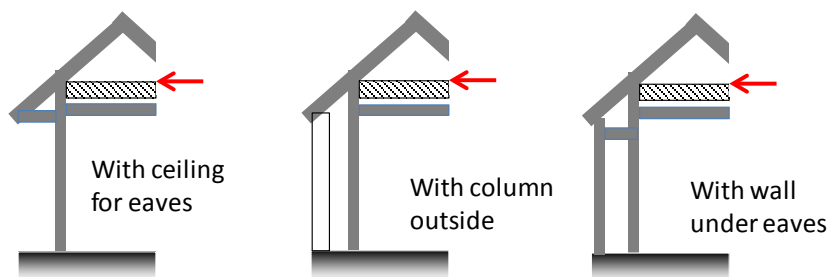
← : Top of “Building Height” [hatched box] : Beam



1. If the roof is out of Lao traditional style, the roof should be counted in “Building Height”.

1. In case of Lao traditional roof, upper edge of “Building Height” is pointed regardless existence of:
(1) ceiling,
(2) beam,
(3) column for eaves, and
(4) wall under eaves.

3. Decoration of Lao traditional roof is not counted in “Building Height”.



(Article 7) 6. “Land Use Ratio (E)”

Land Use Ratio (E) shall be calculated below.

$$E (\%) = C / S \times 100$$

C: Floor area of the First floor in a building site

S: Area of a building site (including the reservation area)

Floor area of the basement is not counted in “C”.

(Article 7) 7. "Land Use Co-efficient (COS)"

Land Use Coefficient (COS) shall be calculated below.

$$\text{COS} = F / S$$

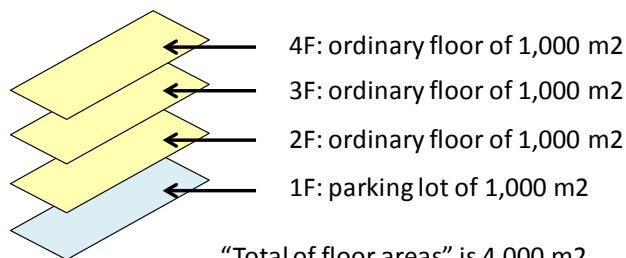
F: Total of floor areas in a building site (including the basement floor)

S: Area of a building site (including the reservation area)

<Exception of "F">

The floor area of parking lot is not counted in "F" at maximum of one fifth of "total of floor areas".

<Application of Exception>



"Total of floor areas" is 4,000 m².

One fifth is 800 m².

Parking lot is not counted in F within 800 m².

Therefore, F of this building is 3,200 m².

2. Advertisement and Sign

2-1. Location

- (1) Location of structures supporting "Advertisement and Sign" must meet requirements of Item 8.
- (2) In addition to (1), it is not allowed to install "Advertisement and Sign":
 - on the roof, nor
 - in the direction not to facing road.

2-2. Amount

- (1) Total surface area of "Advertisement and Sign" must be **20 % or less** of:
 - (a) façade area of the buildings in the site, or
 - (b) width of site (m) X 4 m.
- (2) Total surface area of "Advertisement and Sign" must be **20 % or less** of:
 - (c) width of site (m) X 10 m.

<Remark>

- In case "Advertisement and Sign" board sticking out from the building wall, both sides of the board are counted.
- In case of LED or LCD monitor display, its surface area shall be counted double.
- In case where the building locates at the intersection, this requirement is applied to each side of the building.

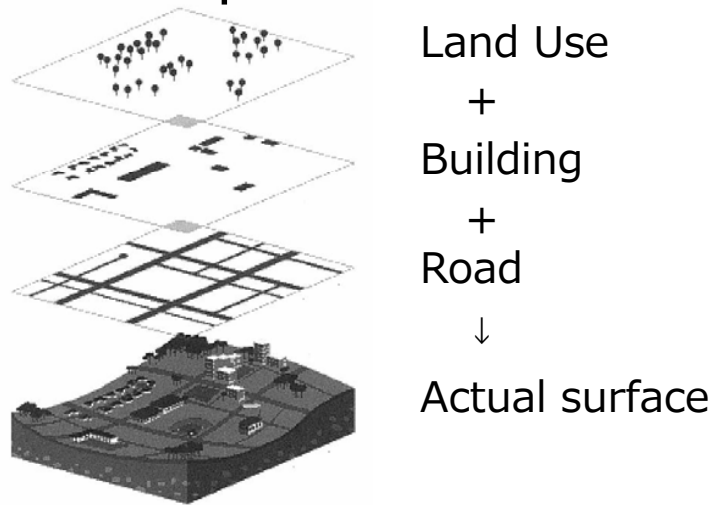
7 Conclusion

Zoning Code for Inner Zone is under preparation. Draft has been compiled. For those who need the Zoning Code, please refer to DPWT of Vientiane Capital or PTI.

What is GIS?

- Geographic Information System (GIS) is a concept of which integrates hardware, software, and data for capturing, managing, analyzing all forms of geographically referenced information. (by ESRI USA)
- GIS is also a tool which can describes features on the surface to the map and analyzes various events surrounding us.

An image of 'What GIS representation is'



What it will represent in GIS is depend on what you want to represent and analyze in GIS.

Datum and Coordinate System

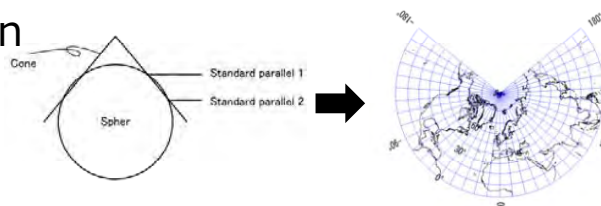
- Datum consist of spheroid and coordinate system.
- Coordinate system determines the location on the surface of the world by coordinates.
 - Geographic coordinate system indicates the location by coordinate of latitude and longitude.
 - World geographic coodinate system is available all over the wolrd in common.
 - 'WGS84' is a popular and virtual standard datum in the world which used for GPS.

Map Projection 1

- Because of the earth is rounded, map projection is necessary to represent the earth's surface on a flat map.
- There are many projections.
- Each projection has 1 or 2 accuracy about area(equivalent), distance(equidistance) and direction(conformal), but it never fulfill these 3 conditions.

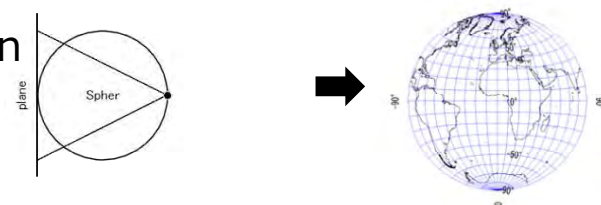
Map Projection 2

- Conic Projection



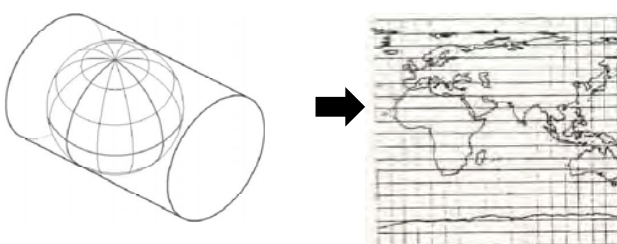
e.g.
Azimuthal
equidistant
projection

- Plane Projection



(equivalent
)

- Cylinder
Projection



e.g.
Mercator
projection
(conformal)

Universal Transvers Mercator (UTM) Projection

- UTM projection is the standard projection for topographic mapping.
 - It also used for general topo-map in Japan.
- UTM projection intersects the sphere at 2 meridians.
 - Area between 2 meridians is called zone.
Zone width is 6 degrees longitude, globe is divided into 60 zones.
- Vientiane, and whole Lao area is included in UTM zone 48.

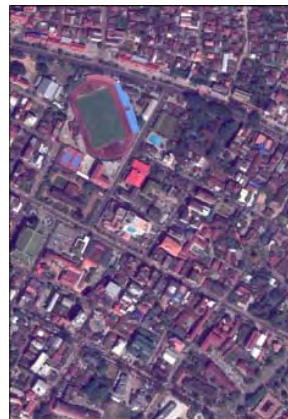
Type of GIS Data

- 2 types of format

Vector



Raster



Vector Data

- Vector data can represent features on the surface in a collection of lines, areas, and points.
- There is 3 types of vector data.
 - Point, Polyline, Polygon
- Vector data has an advantage about accuracy, it can represent the precisiuous position of the features.
- Vector data is good at analysing by positional relation of the features.

Raster Data

- Raster data consist of square lattice straucture.
- It contains image datas and continuity data
 - Image data : Satellite image, Topo-map, Air photo
 - Continuity data : Mesh data
- Accuracy of raster data depends on the resolution.
- Raster data is easy to caluculate for computer.

ArcGIS Operation

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Content

1. ArcMap and ArcCatalog

- Basic operation about ArcMap

2. Data type of ArcGIS and Layer Operation

- Vector data, Raster data

- Layer Operation

3. Editing

- Create new files and new fields



- Data Editing

- Input attributes

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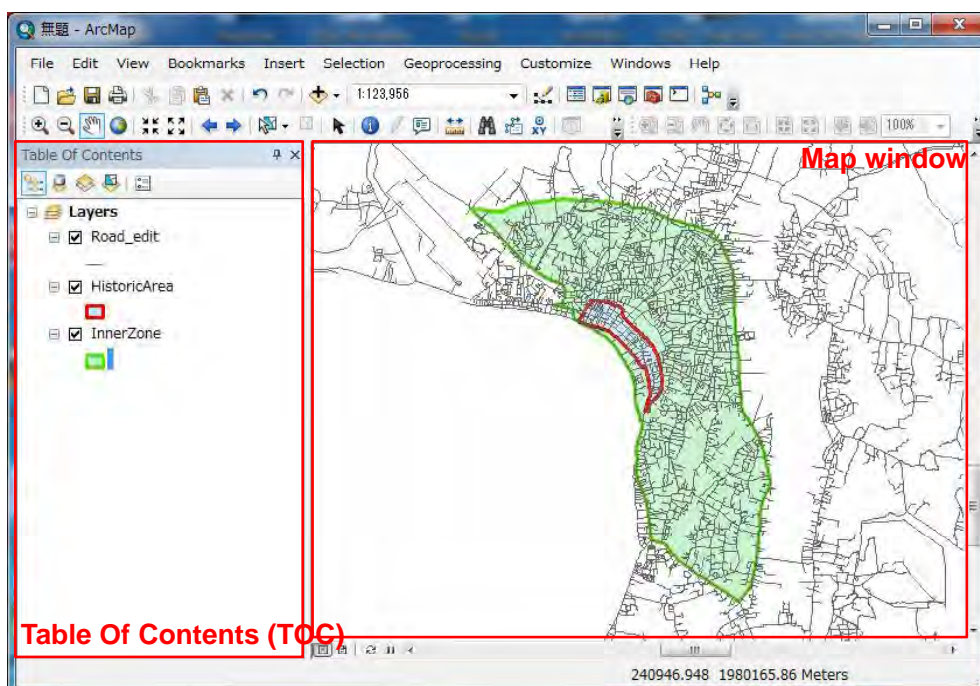
Lesson 1

ArcMap and ArcCatalog

- ArcMap 
 - Creating map : display data, layout, print
 - Editing data : new feature, existing data
 - Analyzing
- ArcCatalog 
 - Application for data management
 - Copy, Delete, Rename and Move files
 - Highly recommend on ArcCatalog than Explore
 - Create new feature class and new field

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ArcMap -component 1-

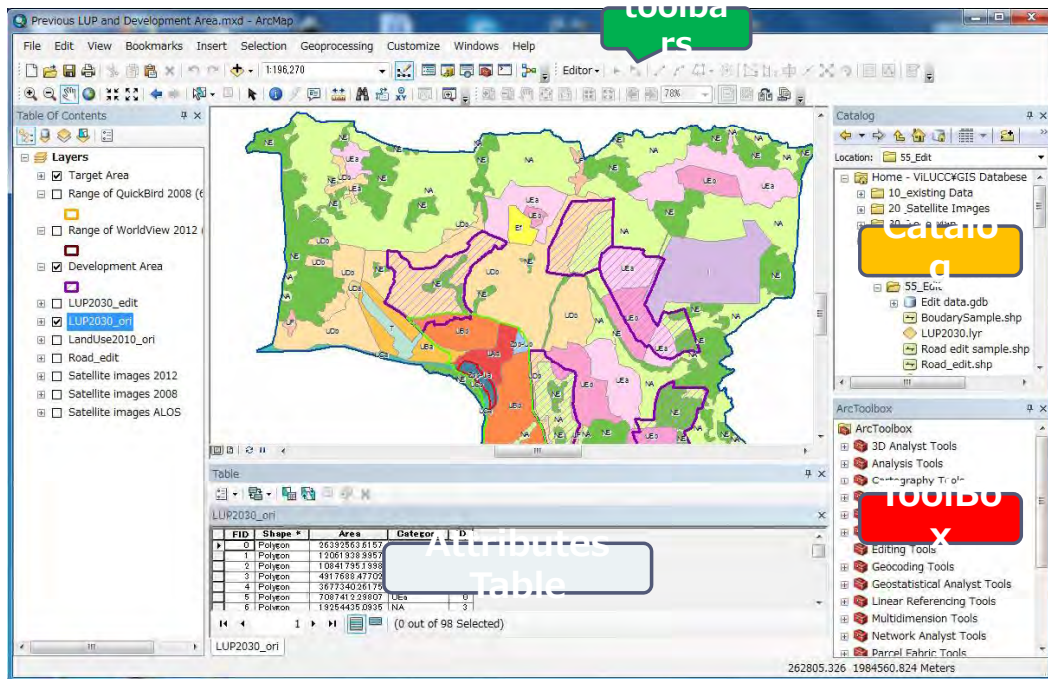


Basic window of ArcMap

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ArcMap -component 2-












You can customize ArcMap window as you like.



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ArcMap -basic tools-



-  Zoom In
-  Zoom Out
-  Pan
-  Full Extent
-  Fixed Zoom In
-  Fixed Zoom Out
-  Previous Extent
Next Extent
-  Select Features
Clear Select
-  Select Elements
-  Identify : Information about features
-  Measure : measure arbitrary area, distal

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ArcMap -shortcut-

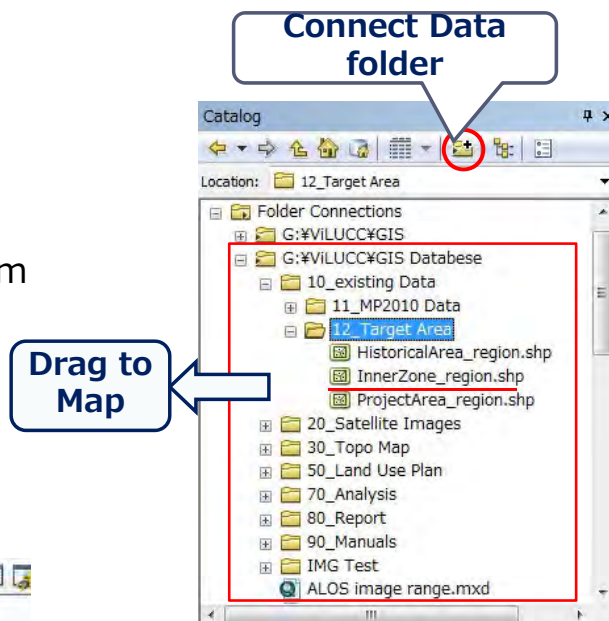
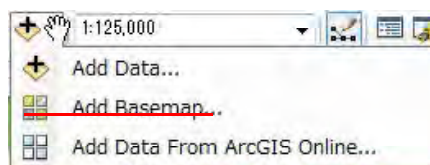
Shortcut list of map window

Operation	Shortcut
zoom in / zoom out	wheeling the mouse
zoom in / zoom out (smaller ratio change)	'Ctrl' key + wheeling the mouse
pan the window	click wheel and drag the mouse
change to zoom in tool at temporary	while hitting 'Z' key
change to zoom out tool at temporary	while hitting 'X' key
change to move tool at temporary	while hitting 'C' key
refresh the window/ restart drawing	'F5' key
stop drawing at temporary	'F9' key
go back to previous extent	'<' key
go to next extent	'>' key
full extent of all Layer	'Insert' key
display full extent of each Layer	'Alt' key + click the name of layer
scroll the window smoothly	'Q' key + moving the mouse

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Add Data to ArcMap

- From Catalog
 - Click 'Connect To Folder'
 - Select data folder
 - Drag file to ArcMap
 - You can also add data from ArcCatalog.
- From 'Add Data' button
 - Click 'Add Data'
 - Select data



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Data and Layer in ArcGIS

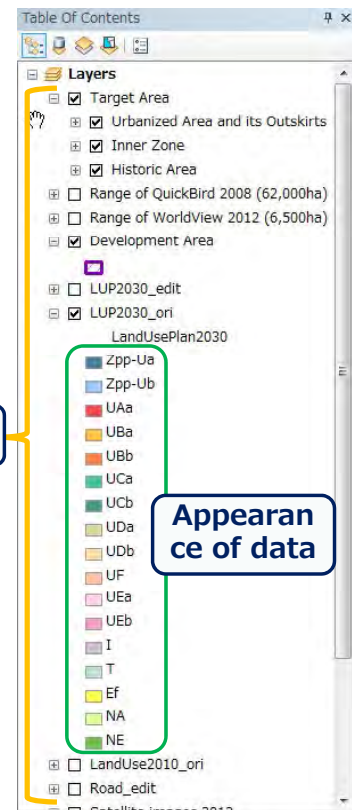
- GIS represent the actual surface through the layers.
- Layer refer to data, and define appearance of the data.
- Map Document (mxd) has the passes of data which layers referring to.
 - full pass, relative pass
 - Default is full pass, you can change it from 'Map Document Properties'.

Pathnames: Store relative pathnames to data sources

Check this box to store relative pass

Layers

Appearance of data



Lesson 2

Vector data (specially in ArcGIS)

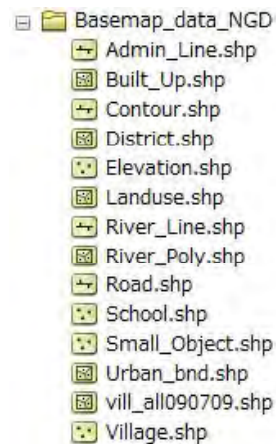
- Vector data present features by points, polylines, and polygons.
 - Each features are defined shape by coordinates.
- Vector data is stored as 'feature class' in ArcGIS.
 - 'Feature class' is an assemblage of same type of feature.
- 'Feature class' has features and attributes, and each feature correspond with attribute one by one.

FID	Shape	ID	OID	No.	LU_CODE	Descript	Definition
5069	Polygon	2	1	2	2	Commercial area	Take educative guess and local know
5070	Polygon	2	1	2	2	Commercial area	Take educative guess and local know
5071	Polygon	2	1	2	2	Commercial area	Take educative guess and local know
5072	Polygon	2	1	2	2	Commercial area	Take educative guess and local know
5073	Polygon	2	1	2	2	Commercial area	Take educative guess and local know

Vector data format 1 -Shape file-

- Shape file is a data format of ESRI, ArcGIS.
- Shape file is the most common format of GIS, and it has strong intercivic for another GIS formats.
- Shape file consist of individual feature class.

- Point 
- Polyline 
- Polygor 



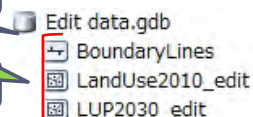
21

Vector data format 2 - Geodatabase-

- Geodatabase is a standard data format of ESRI.
- Geodatabase can store feature class, raster dataset, table data, and so on.

Geodatabase

Feature Class

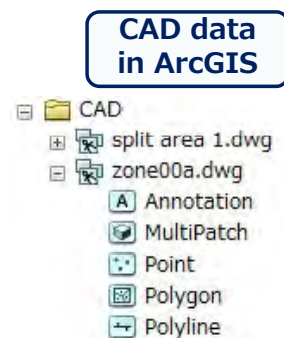


- Geodatabase has comprehensiveness that can manages several types of data as package.
- Geodatabase also has flexibility that can imports and exports many types of data format.
- But Geodatabase has no intercivic for another GIS software, so you can see the contents of Geodatabase only in ArcGIS.

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Vector data format 3 -CAD data-

- ArcGIS supports CAD data format.
- CAD data consists of multi-features in ArcGIS.
 - Annotation, MultiPatch, Point, Polygon, Polyline
- You can't edit CAD data in ArcGIS.
 - You need to change CAD data into shape file or Geodatabase before edit.
- In most cases, CAD data has not any coordinates.
 - You need georeference (refer coordinates) in ArcMap to lay the CAD data on the map, using Georeferencing Tool.



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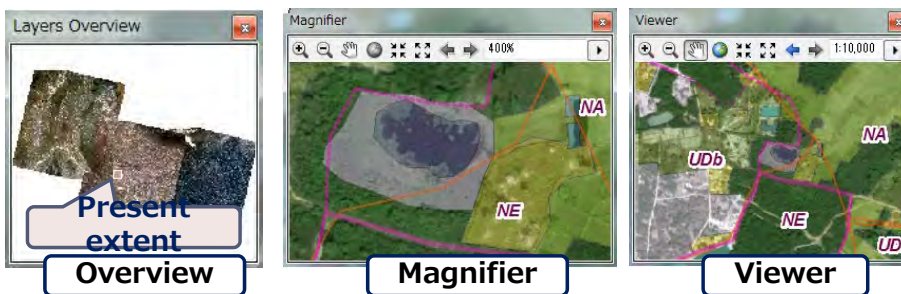
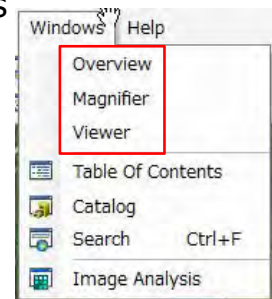
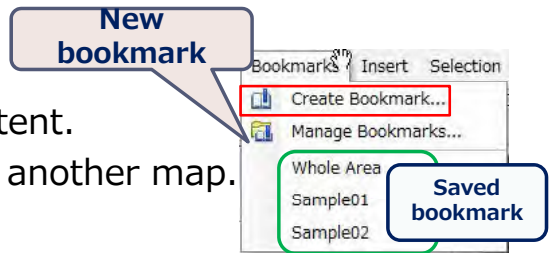
Raster data

- General format of raster data is as follows:
 - TIFF, JPEG, GIF, IMG, DEM etc.
- Raster data is stored as raster dataset in ArcGIS.
- Raster data consist of square lattice structure, alignment of same size cell.
 - Accuracy of raster data depend on resolution of image, it means that a cell represents coverage of the surface.
 - Each cell has a value of integer or float.
- Basically, raster data has no coordinates, so you need georeference in ArcMap to lay the raster data on the map.
- Some raster data has coordinates, as GeoTIFF.
 - Satellite images which we purchased have coordinates.

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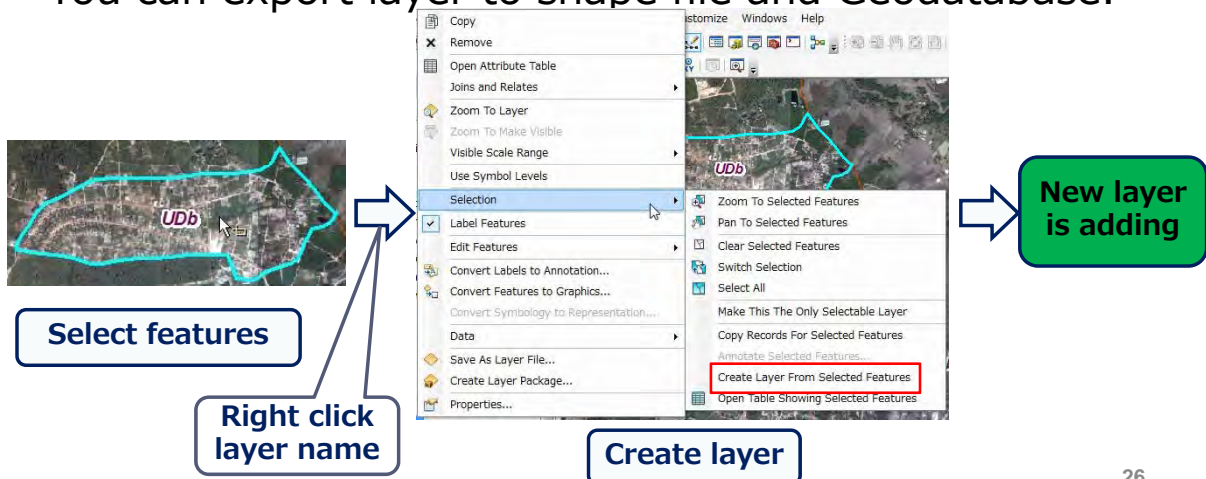
Layer 1 -Bookmark and Window-

- Setup the bookmark
 - You can move to the saving extent.
 - You can also load the extent in another map.
- Display another windows
 - Overview : display present extent in all layers
 - Magnifier : display in magnification ratio
 - Viewer : another window



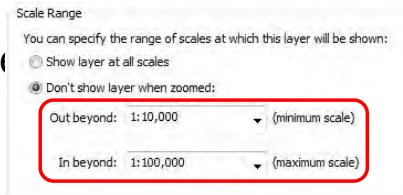
Layer 2 -Create new Layer from selection-

- Select features and right click the Layer name in TOC.
- Select 'Create Layer From Selected Features', then new Layer appears in TOC.
- You can export layer to shape file and Geodatabase.

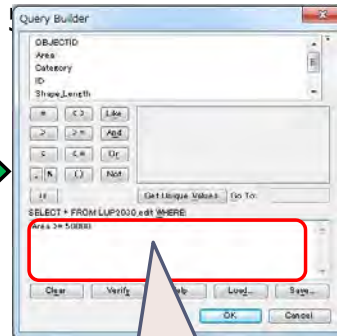
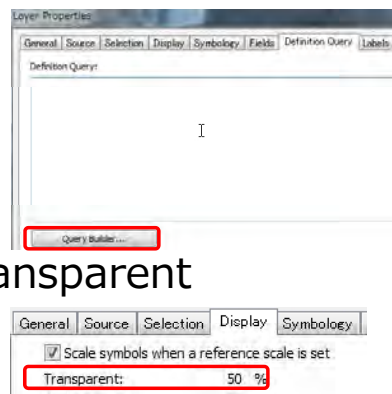


Layer 3 -Control Display-

- Confine displaying range of scale
 - Minimum size, Maximum size
- Control displaying features from arbitrary filter
 - Specify displaying features by SQL expression
 - e.g. Display features which area is over



- Displays transparent

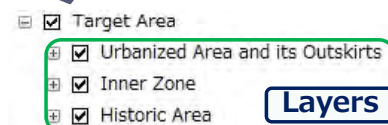


Input conditional expression

Layer 4 -Group Layer and Layer File-

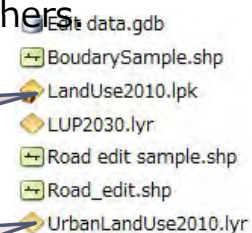
- Group Layer
 - It can setup some properties in block.
- Layer File (.lyr)
 - Layer file can store the layer properties and data pass.
 - You can share the layer you have built to others.

Group Layer



Layer Package

Layer File



- Layer Package (.lpk)
 - Layer package includes both the layer properties and data source referenced by the layer.
 - You can share layer appearance and data with another PC.

Layer Operation -shortcut list-

Shortcut list of Tabel Of Contents (TOC)

Operation	Shortcut
activate data frame	'F11' key
spread selected layer	'→' key or ' + ' key
close selected layer	'←' key or ' - ' key
display/nondisplay selected layer	'space' key
display/nondisplay all layer	'ctrl + space' key
rename selected layer	'F2' key
open property of selected layer	'F12' key or 'Enter' key
open attribute table of selected layer	'ctrl + T' key
activate next data frame	'ctrl + Tab' key

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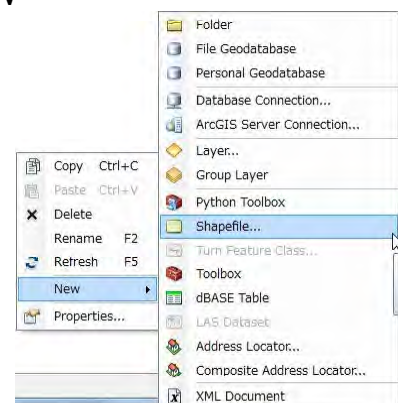
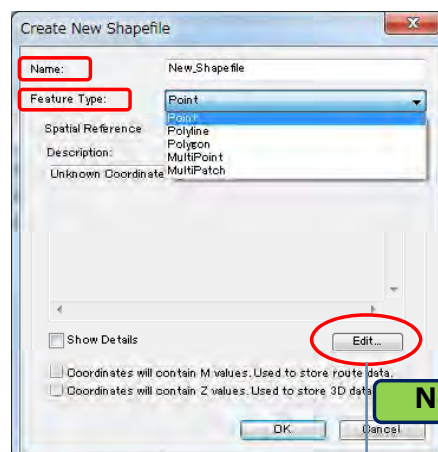
Lesson 3

Create new GIS file 1 (shape file)

- Activate ArcCatalog or open Catalog window in ArcMap.
- Right click in Catalog and select 'new' then 'Shapefile'.
- Input file name and select feature type.



Catalog window

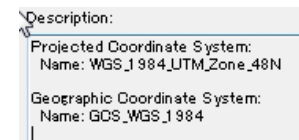
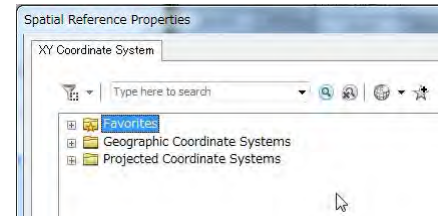


Next page

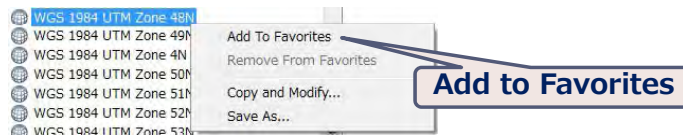
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Create new GIS file 2 (shape file)

- Click 'edit', then Spatial Reference Properties appears.
- In this lesson, specifying 'WGS1984 UTM Zone48N'.
- Select as follows :
 - 'Projected Coordinate Systems'
 - 'UTM'
 - 'WGS1984'
 - 'Northern Hemisphere'
 - 'WGS 1984 UTM Zone 48N'
- Click 'OK', then description about coordinates system is added.



- At selection of projection, right click then you can add it to 'Favorites'.

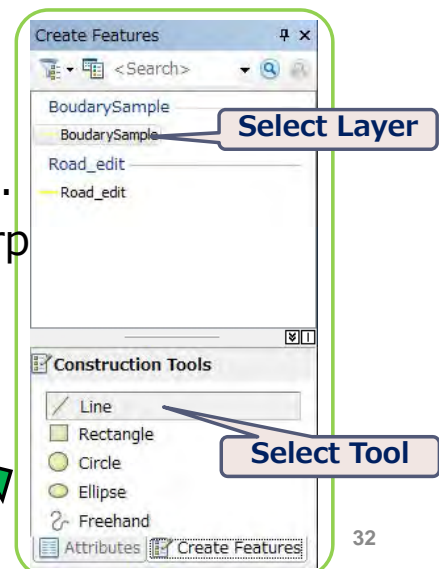
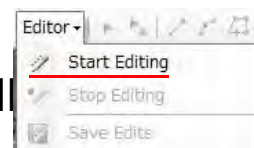


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Data Editing

- Start editing
 - Select 'Start Editing' in Editor tool
- Finish Editing
 - Select 'Stop Editing'.
- 'Create Features' window
 - Select the layer you want to edit.
 - Choose suitable tool for your purpose

Tools are changing by feature type.



Editor toolbar

Editor

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Editor Toolbar

Editor (dropdown menu)

- Edit Tool**: Select and Edit features
- Edit Vertices**: Modify sketched vertices, Add or delete vertex, Continue feature
- Split Tool**: Split a selected feature
- Reshape feature Tool**: Reshape a line or polygon
- Attributes**
- Create Features**

Editor Menu (dropdown menu)

- Start Editing
- Stop Editing
- Save Edits
- Move...
- Split...
- Construct Points...
- Copy Parallel...
- Merge...
- Buffer...
- Union...
- Clip...
- Validate Features
- Snapping
- More Editing Tools
- Editing Windows
- Options

Start, stop, and save editing
Operate selected feature
Store more editing tools

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Snapping

- Snap is used for connection of features correctly, vertex by vertex.
- Mouse pointer can be snapping at the place of features which are selected in Snapping Tool.
 - Point, End, Vertex, Edge
 - Using for ... Connection of road, landuse, etc.

Snapping (toolbar)

- Point
- End point of the feature
- Vertex
- Edge : line segment

Diagram illustrating snapping points on a line:

- Vertex
- Edge
- End point
- Vertex
- Edge
- End point

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Edit -shortcut list-

Shortcut list for Edit

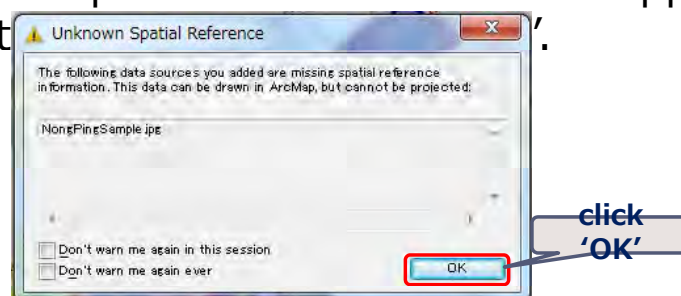
Operation	Shortcut
showing vertex	'V' key
cancel	'Esc' key
undo	'Ctrl + Z' key
redo	'Ctrl + X' key
interrupt snapping	while hitting 'Space' key
Delete the sketch	'Ctrl + Delete' key
Finish the sketch	'F2' key

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Lesson 4

Georeference 1

- Georeference is able to adjust the location of Raster data which doesn't define coordinates (hereafter 'new Raster').
- Add Laster data or Raster data which coordinates already defined in ArcMap, and add new Raster, too.
- 'Unknown Spatial Reference' window appears. Ignore t



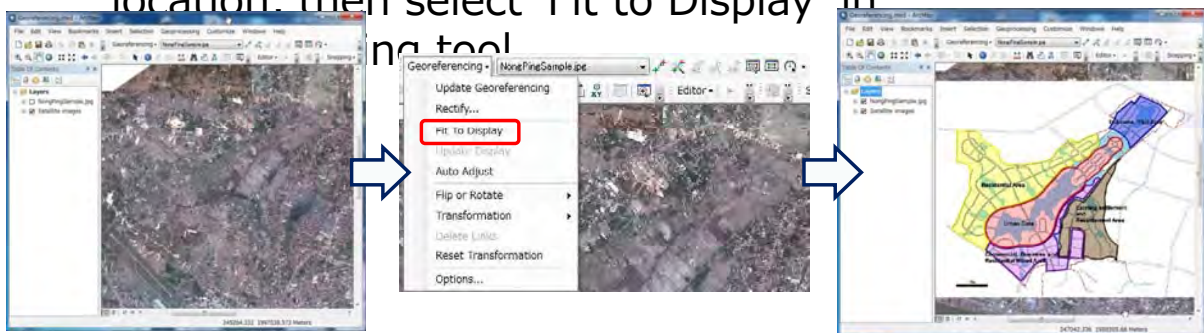
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Georeference 2

- Display 'Georeferencing' toolbar, and select Layer name in box.
 - Select from 'Customize – Toolbars – Georeferencing'



- Move map window to approximate range of Raster location, then select 'Fit to Display' in the toolbar.

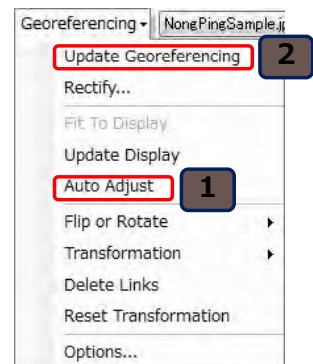


Georeference 3

- Zoom in the map to characteristic points as crossroads and click 'Add Control Points'.
 - Hint : Change transparency of the Layer
- Click the point of new Raster at first, then click the point of the Layer coordinates defined (make link).

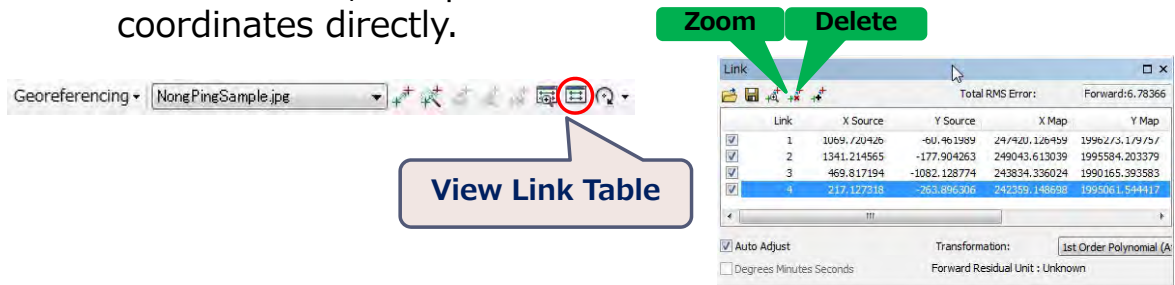


- Continue above routine and set more than 4 points –in case of 1st Order Polynomial (Affine).
- Click 'Auto Adjust'. If location of new Raster is right, click 'Update Georeferencing' then coordinates is defined.



Georeference 4

- If location of new Raster isn't right, then click and open 'View Link Table'.
 - At 'Link' table, it is possible to zoom and delete link and edit coordinates directly.



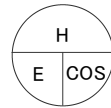
- Georeference is also usable for CAD data. In case of CAD data, you can assign only 2 points.

Attachment 5

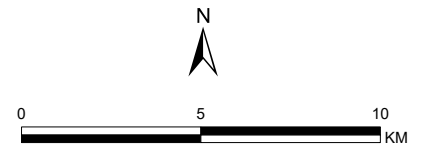
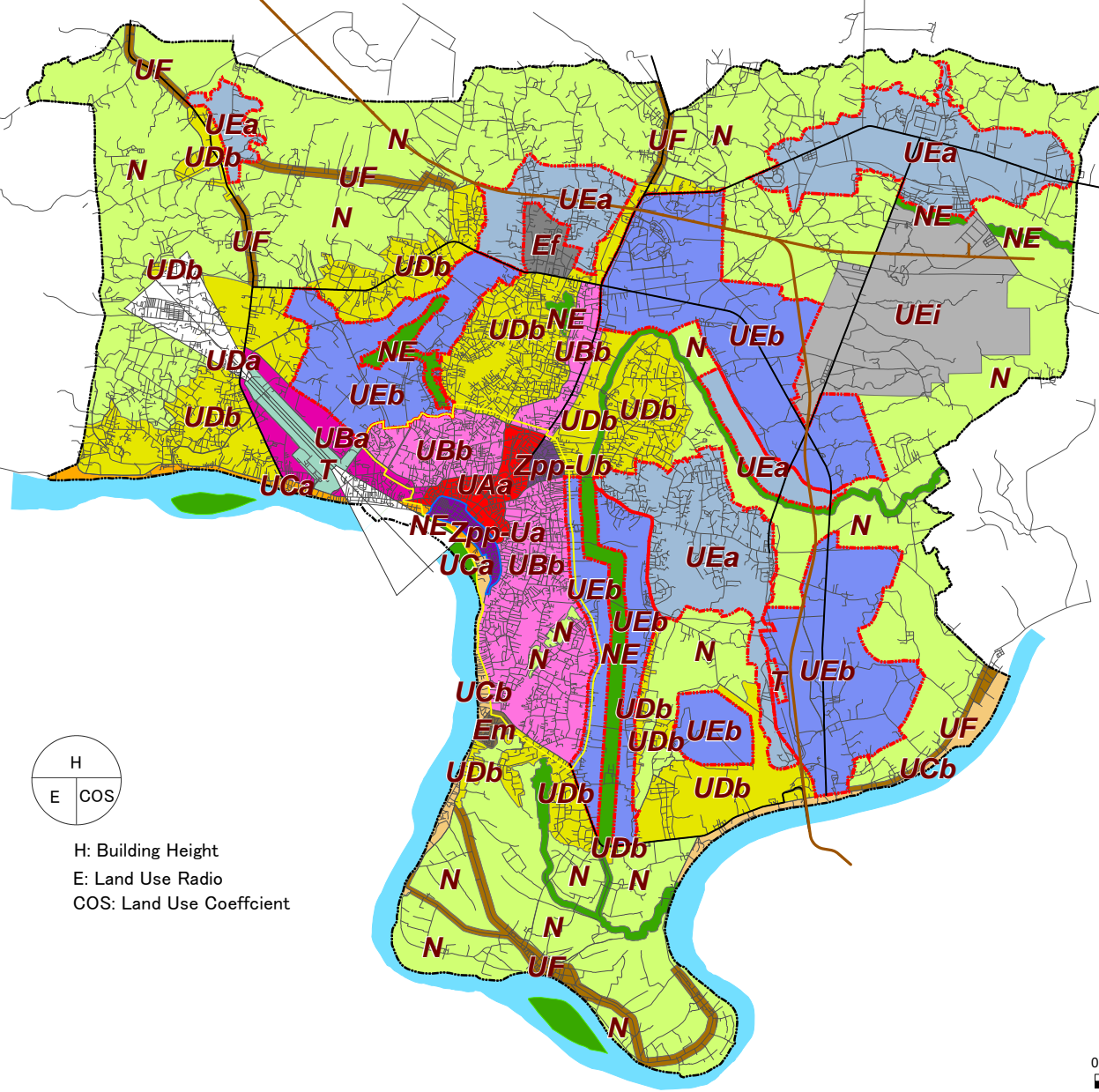
General Land Use Plan (draft)

General Land Use Plan of Vientiane Capital

General Land Use Plan				
	Polyline			
	Inner Zone			
	Target Area of General Land Use Plan			
	Historic Area			
	Road			
Land Use Zones	H	E	COS	
	Zpp-Ua : 193 ha	20	75	2.0
	Zpp-Ub : 109 ha	7	50	0.7
	UAa : 512 ha	26	60	4.0
	UBa : 735 ha	20	60	1.5
	UBb : 3,345 ha	20	60	1.5
	UCa : 295 ha	10	50	1.0
	UCb : 582 ha	10	50	1.0
	UDa : 55 ha	7	40	0.7
	Udb : 8,319 ha	15	50	2.0
	UF : 1,195 ha	10	40	1.0
	UEa : 6,308 ha	23	50	3.0
	UEb : 9,665 ha	-	-	-
	UEi : 3,069 ha	15	40	1.5
	T : 432 ha	-	-	-
	Ef : 292 ha	-	-	-
	Em : 82 ha	-	-	-
	N : 24,476 ha	10	-	-
	NE : 1,946 ha	-	-	-
Total = 61,608 ha				



H: Building Height
 E: Land Use Ratio
 COS: Land Use Coefficient



1:50,000

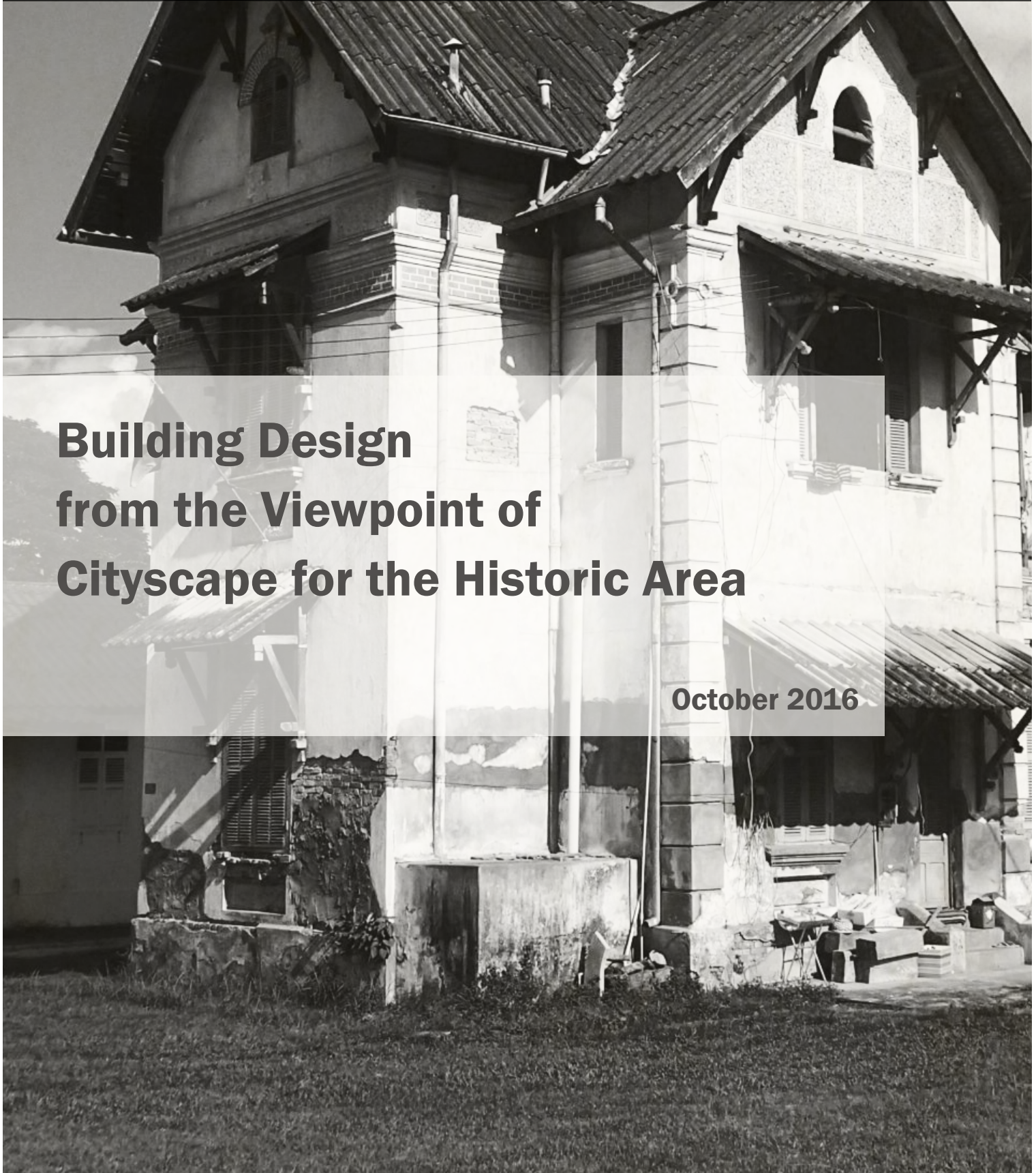
Attachment 6
Reference Book

Vientiane Capital

Reference Book

**Building Design
from the Viewpoint of
Cityscape for the Historic Area**

October 2016



Thank you for your attention on this book!

This reference book was published for developers and land and shop owners who have plans to construct a new building or rehabilitate an old building in the historic area.

The reference book consists of three parts: **Area and Cityscape Design, Building Design, and Advertisement and Sign Design.** In the reference book, the outline of the detailed land use plan and zoning code was inserted for necessary conditions for construction work.

This reference book will be an effective tool in making plans of new buildings or rehabilitation of old buildings. However, it is not an obligation to obey the design recommendation part of this book.

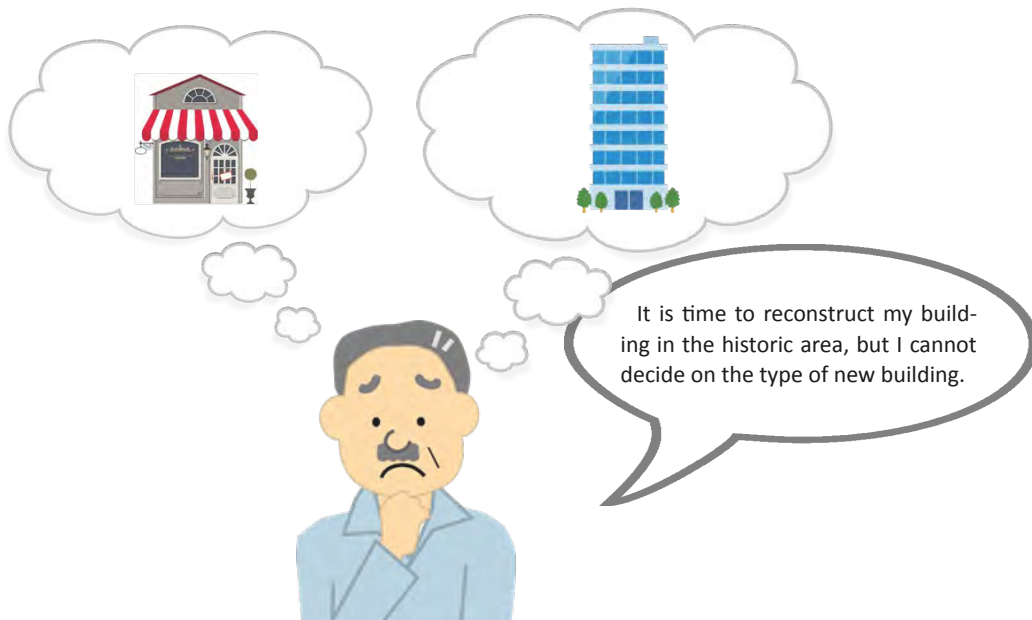
The 'historic area' is a special area in Vientiane Capital where many tourists expect to experience Lao's culture, hospitality, and cityscape. The design of buildings located in the historic area must be harmonious with the surrounding cityscape.



Who should use this reference book?

This reference book should be read by the following persons:

- Developers who have plans to construct a new building or rehabilitate an old building in the historic area,
- Building owners who have plans to demolish their old building (In the historic area, there are many Lao traditional and/or French colonial buildings. Any plans to demolish such type of building should not be recommended.), and
- Developers who have plans to construct new advertisement and sign in the historic area.



Please check the next items before making a plan

Detailed land use plan and zoning code for urban planning have been enforced in Vientiane Capital. Any plans to build a new building in Vientiane Capital must follow these regulations.

Old buildings in the historic area were surveyed and listed by French Study Team in 2003 (**Historic Buildings Inventory, France 2003**). The Ministry of Information, Culture, and Tourism (MICT) tried to confirm the existing buildings listed in the French Inventory 2013. In this survey, some old buildings were already demolished, while some were rehabilitated. Vientiane is the capital city of Laos and many tourists come to see the historic buildings. These buildings are important for the charm and character of Vientiane Capital. It is important to understand the worth of historic buildings, and owners of historic buildings are expected to rehabilitate the building for Vientiane Capital's city scape.

Please read the reference book and enjoy making plans for your future building.

Contents

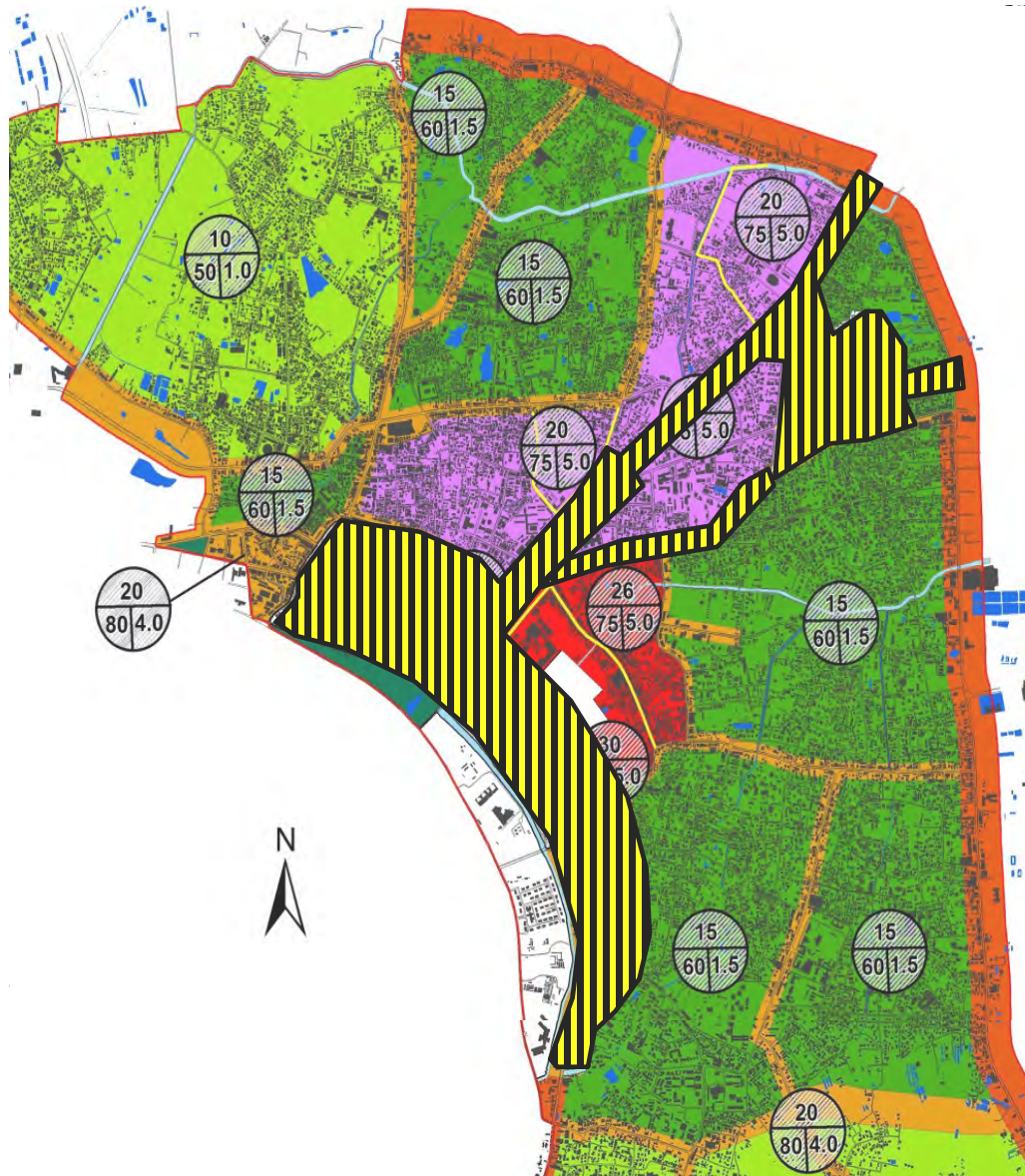
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Coverage of this Reference Book

The coverage of this reference book, the historic area of City Wall and Thatluang and road side of Lanexang, Kaysone Phom-

vihane, and 23 August streets (yellow area) are shown in the figure below.



Map 1: Vientiane Capital 2016

I. Area and Cityscape Design

1. Regulation

Detailed land use plan and zoning code (Detailed LUP/ZC) for urban planning have been enforced in Vientiane Capital. Land use, COS: land use coefficient, E: land use ratio, and H: building height are limited by this regulation.

The first step is determining the planning site of a new building. Please check the detailed land use plan. The “external feature” and “distance from site boundary” must be observed for cityscape.

1.1. Color of Building and Structures

(Historic area of City Wall and Thatluang and roadside of Lanexang, Kaysone Phomvihane, 23 August streets)

In case of buildings located in the historic area of City Wall and Thatluang and facing Lanexang, Kaysone Phomvihane, or

23 August streets, their external parts, including frame of windows and parapet of roofs, must be mat-white (khaaw daan). The slightest hint of color (sii ohne thii sut) may be added into mat-white.

(Exceptions)

Parts of exception	Required Conditions
Glass of windows	Colorless and transparent only
Parts made of wood	Mat white or Wood color only
Roofs (including decoration of roofs)	Not vivid color
traditional ornament on the top of column and the like	Mat white or Gold, in principle
Floors	Mat white, Wood Color or Brick color only
Treads and Risers of stairs	
Advertisement and Sign	Not vivid color
Others that the administration organization allows	Only in the case there is historic reason



Photo: Parts made of wood should be Mat white or Wood color only



Photo: Glass of windows should be Colorless and transparent only

1.2. Fence and Standing Wall


In case there is a fence or standing wall, the maximum height must be 2 m and parts with height of 0.8 m or more must be see-through.

About the characteristics of the site and distance from the site boundary, several

regulations are enforced. From the point of view of landscape, the level of the first floor of row house (Item 9: $0.3m \geq \text{height of the first floor}$) is important. Kindly refer to the following table for the fence and standing wall measurements.

Subject		Item	Row house	Independent building
Width touching the road		item 5	Width \geq 4m	Width \geq 4m(*)
Site area (excluding reservation area)		item 5	Site area \geq 48m ²	Site area \geq 140m ²
Distance from the next site		item 6	No requirements	Distance \geq 2m
Distance from the back site		item 6	Distance \geq 2m	
External wall facing the road	Distance from the construction line	item 8	No requirements	Distance \geq 4m
	Parallel	item 8	Parallel to the construction line	No requirements
Level of the first floor		item 9	Height of the first floor \leq 0.3m	No requirements

(*) In case that the building site is touching the road with its narrow part longer than 50 m, the width of the narrow part \geq 6 m.

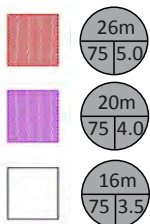
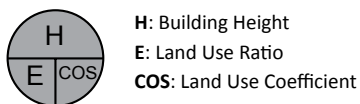
 means that items, which are severer than the other type of building.

1.3. Zoning Code

Please check COS: land use coefficient, E: land use ratio, and H: building height. This is the most important in the first step of planning.

More items of regulation are enforced in Vientiane Capital. For example, wall color,

height of fence, volume of advertisement and sign, etc. These items are very important. It is important to understand such regulations and start to make a plan of the new building.




The borderline in the northern part are set with the following distance:

- 70 m south from the centerline of Samsenthai Street,
- 30 m south from the centerline of Henboun Street,
- 30 m from the centerline of Sethathilat Street,
- 30 m from the edge of the Temple site,
- 30 m from the edge of the That Dam, and
- 30 m from the edge of the Nam Phu.

The borderline in the southern part is set with the following distance:

- 70 m from the center line of the Thadua Street.

 Site of temples (These areas are included in the white area.)

Map 2: Vientiane Capital 2016

Illustration of future image of the historic area's roadside cityscape along Samsenthai, Nokeoummane, and Setthathilath streets.

Samsenthai Street (Green Line in Map 3)

The regulations for the roadside of Samsenthai Street are as follows: COS: 500%, E: 75%, H: 26 m

About eight or nine-storey buildings can be constructed in this area.

Nokeoummane Street (Red Line in Map 3)

The regulations of roadside of Nokeoummane Street are as follows: COS: 400%, E: 75%, H: 20 m

About six or seven-storey buildings can be constructed in this area.

Setthathilath Street (Blue Line in Map 3)

The regulations of roadside of Setthathilath Street are as follows: COS: 350%, E: 75%, H: 16 m

About five-storey buildings can be constructed in this area except in the area 30 m from a temple.



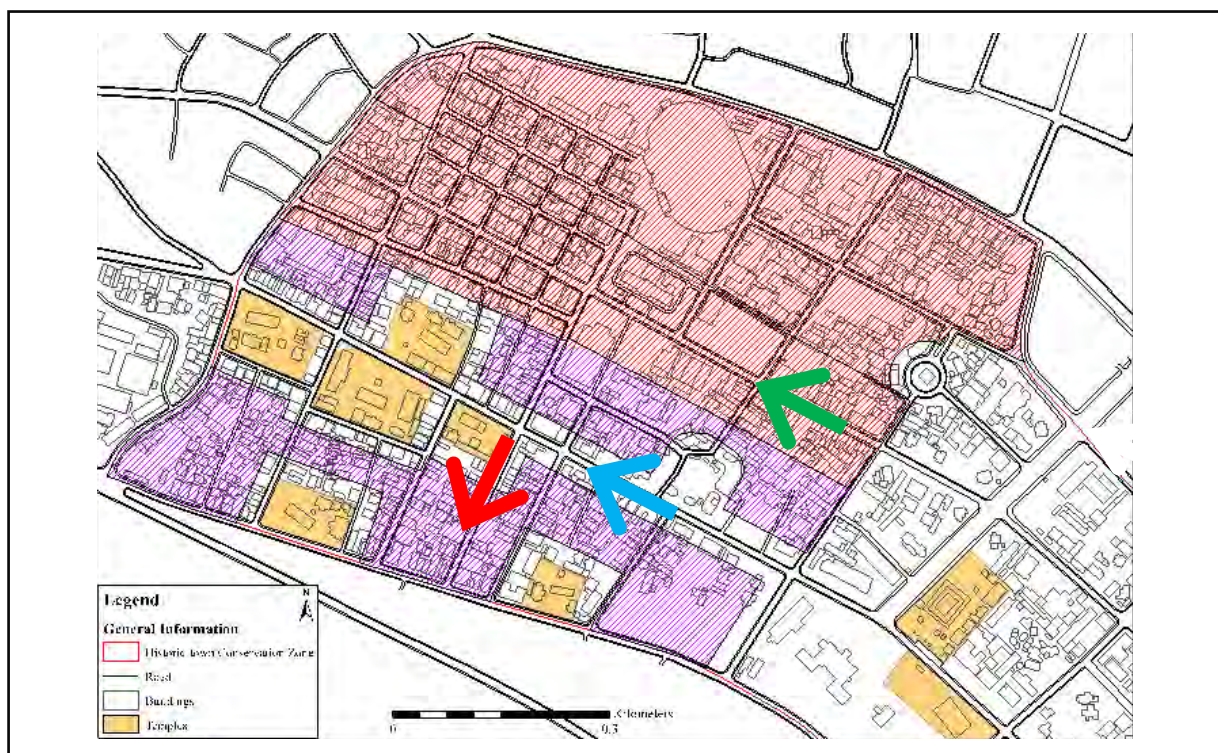
Photo1: Samsenthai Street



Photo2: Nokeoummane Street



Photo3: Setthathilath Street



Map 3: Vientiane Capital 2016

2. Recommendation in General

2.1. How to Use the First Floor

The historic area is the most attractive place in Vientiane Capital. There are many hotels, guesthouses, souvenir shops, and restaurants, and such buildings form the historic area's cityscape.

It is necessary to keep such situation and cityscape of this area. Recently, some old buildings (French colonial or Lao traditional design) were demolished and new buildings were constructed. First floors of some new buildings became warehouses and offices while the first floors of some old buildings are vacant.

It is very important that the first floors of all buildings in the historic area are carried on and should look appealing to tourists. If some shops are closed, tourists will not walk up to the end of the street to look for open shops, so the first floors of each building is very important. The recommended situations of the street side of the historic area are the following:

- To open shops and businesses for tourists.
- To use reservation areas for restaurants (terrace seats) and for displays.
- To put appeal and charm in shops by putting light and other colorful decorations.
- To keep each building's parking lots to other places outside the historic area.
- During nighttime, it is effective to use illumination and lights with moderation.



Photo4: Can we see the inside of the shop?



Photo5: Terrace and first floor of the building become open restaurant



Photo6: During cool nights, the terrace seats become special seats



Photo7: Open terrace

2.2. Height of Eaves of First Floor

In the historic area, old buildings are demolished and new buildings are constructed. The height of the first floor's eaves of some new buildings are very high. The building's eaves disturb the straight line of eaves of the first floor and give a feeling of pressure to passers. The historic area must be an appealing space for tourists. The cityscape of the buildings should be arranged in good harmony.

Figure-1 is an image of the cityscape without unification of line of the floor's eaves. Figure-2 is an image of cityscape with consideration of the line of height of eaves of the first floor. In Figure-1, the second and third buildings do not have eaves and there is a high wall that gives pressure to passers. In Figure-2, eaves are installed with the same height.

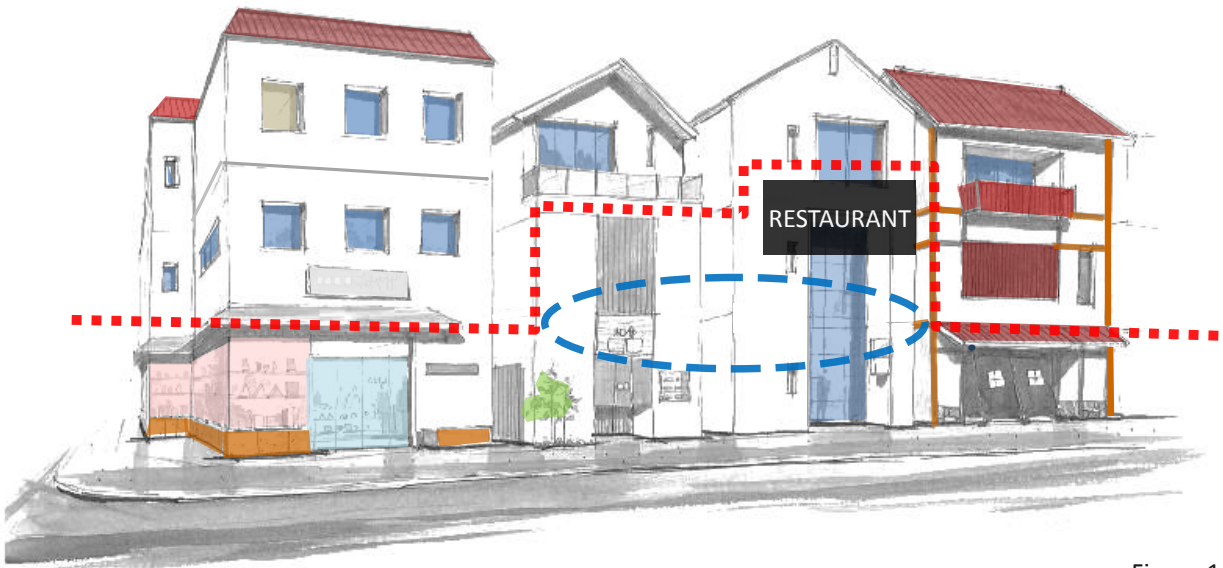


Figure-1




Figure-2

It is recommended to use shade, tent, and eaves to form height of eaves of the first floor. This is good and simple method of making a good cityscape.

Photos of Case-1 and 2: Cityscape of Paris
 (Source: Book of Travels in Europe, Yoshinori Uchiyama, <http://www.uchiyama.info/kaigai/>)

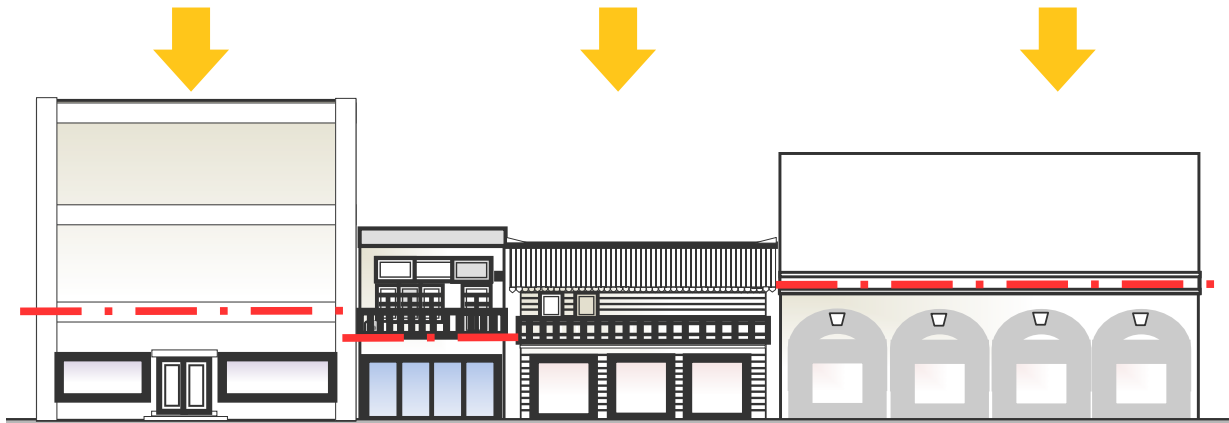
CASE-1:
 The height of eaves of the first floor is about 4.50 m
 To use shade under eaves and make second line of eaves.



CASE-2:
 The height of eaves of the first floor is about 4.00 m
 To use shade under eaves and make line thick.



CASE-3:
 The height of eaves of the first floor is above 4.50 m
 To use shade under eaves and make second line of eaves.

II. Building Design

1. Introduction

Detail of Historic Area Expansion

The oldest map of Vientiane was assumed to be made from 1895 to 1898. The scale of map is 1/2,000. The map shows that Chao Anou, Nokeokoummane, Fa Ngum, and Setthathilat streets have already existed in the 19th century, while the Setthathilat and

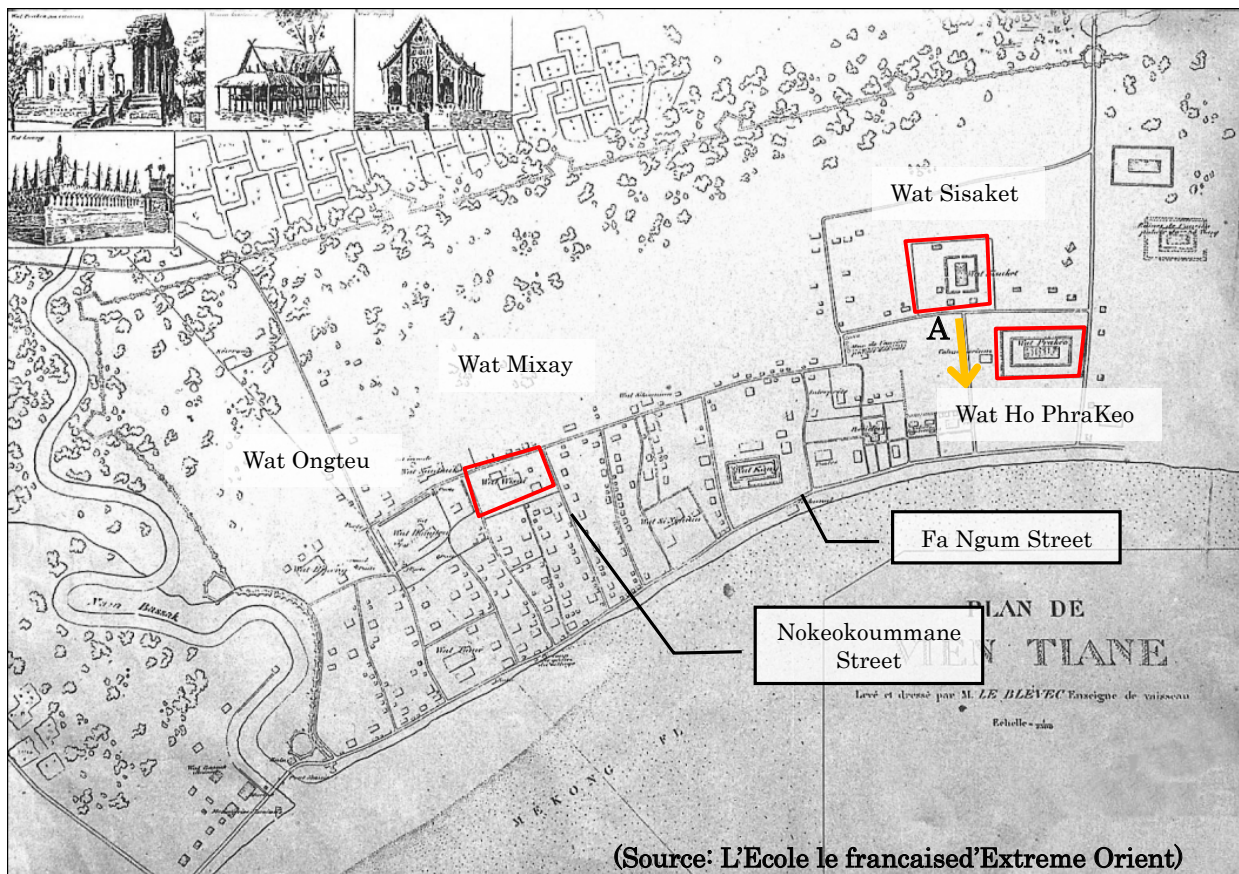
Lane Xang streets have not yet existed. The location of Wat Sisaket, Wat Mixay, Wat Ongteu, and Wat Chantabouri shows the size of the city area and road network at that time.



Photo: Wat Sisaket Explanation Board
(The precincts of temple)



Photo: the front approach to Wat Sisaket



(Source: L'Ecole le francais d'Extreme Orient)

Map 4: Vientiane Capital 1895-1898

The map shown below, made in 1912, shows the expanded urban area and road network. Around that time, Laos was a colony of France. Notable urban characteristics are summarized below.

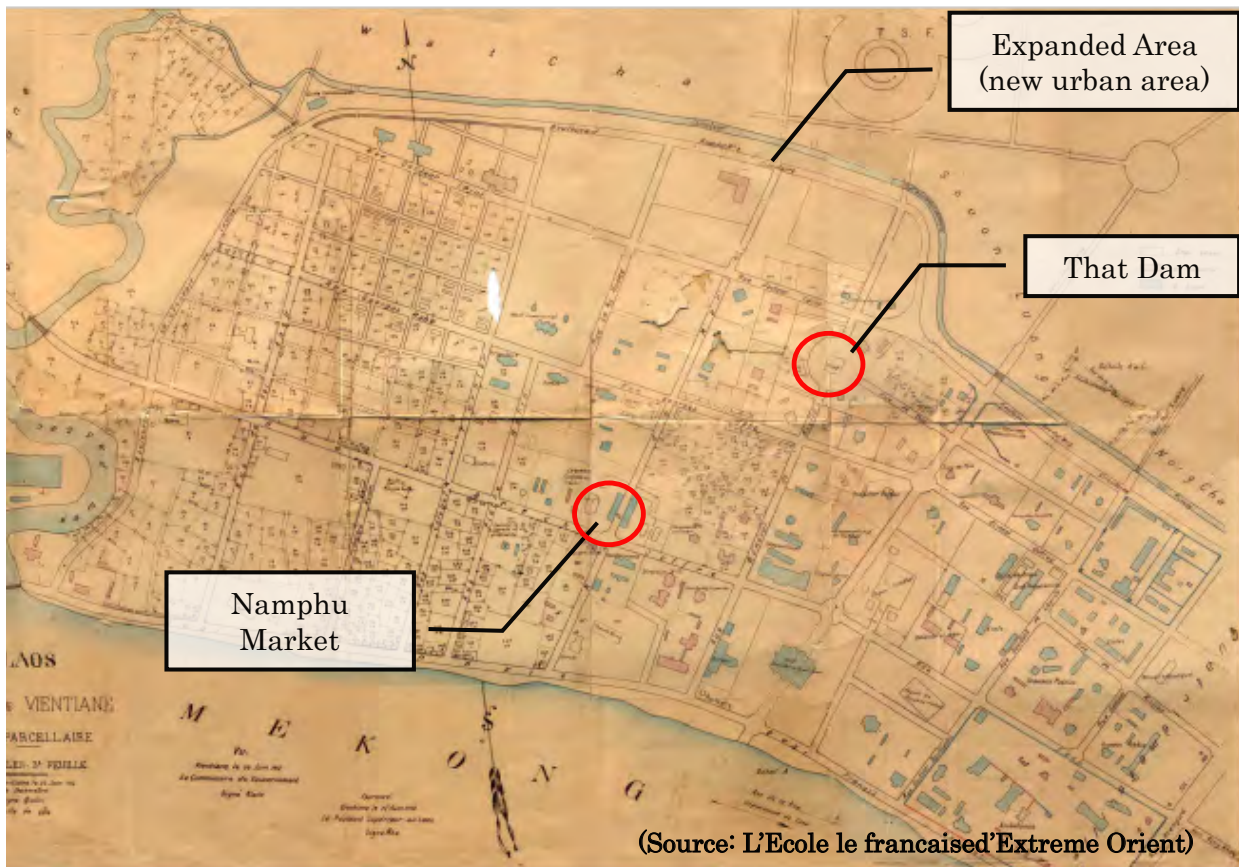
- The 1910s road network of the historic area is the same as the existing road network. Phai Nam Street was already constructed.
- Around That Dam had already developed as orchards.
- The urban area was expanded to the north, and east-west roads (Phnompenh Street and Du Puits Street) and north-south roads (Saigon Street and Toulan Street) were constructed.
- Namphu Square was not constructed and that area was used for market (Namphu morning market).



Photo: Namphu Morning Market (1912)



Photo: Namphu Square (2016)



(Source: L'Ecole le francaised'Extreme Orient)

Map 5: Vientiane Capital 1912

The map shown below was made in 1970. Around that time, the United States began to interfere with the internal affairs of Laos from 1960 to 1970, and general election was conducted in Laos. Notable urban characteristics are summarized below.

- Lane Xang Street was already constructed to existing road width and construction of Patou Xai had started. The parliament has been completed.
- Namphu Market (morning market) was demolished, and Namphu Square was constructed.
- The urban area spread further to the northeast from the historic area.
- The urban density in the historic area has gone up.
- Some government buildings were constructed around Patou Xai and roadside of Lane Xang Street.



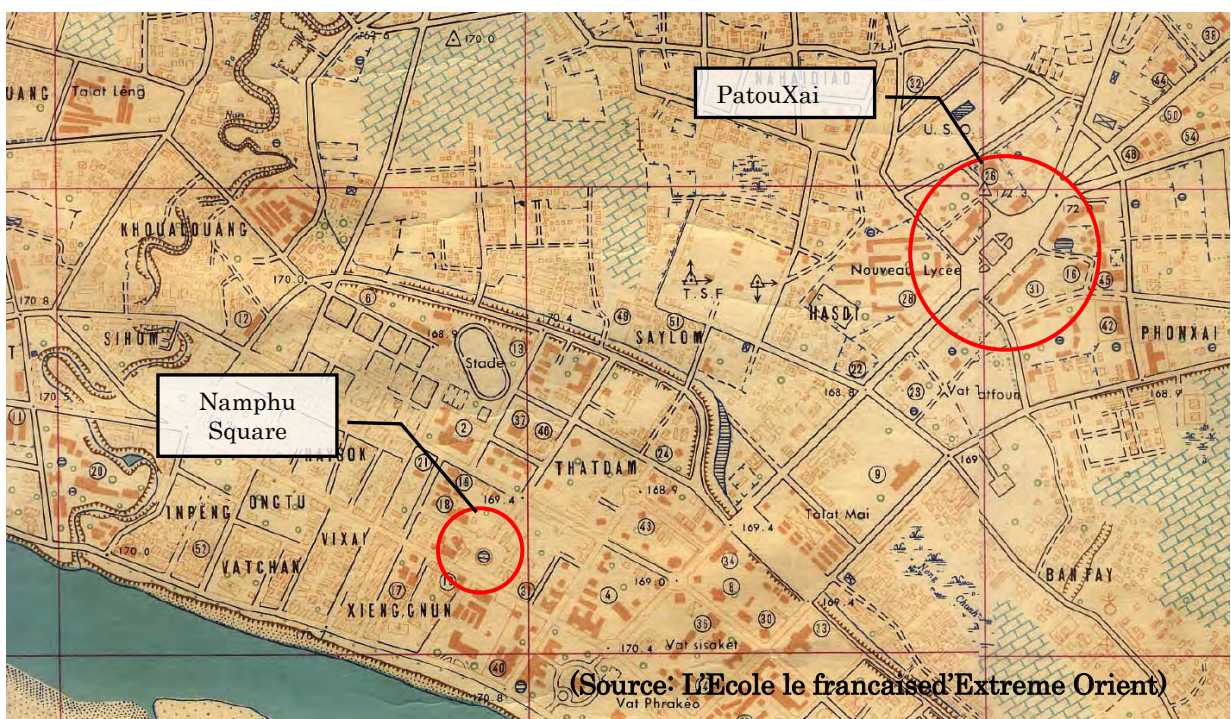
Photo: ChaoAnou Street (1960-1970)
(Source: Gonzalo Cancino FB)



Photo: Setthathilath Street (1960-1970)
(Source: Gonzalo Cancino FB)



Photo: Lane Xang Street (1964)
(Source: Gonzalo Cancino FB)



Map 6: Vientiane Capital 1970

Five Styles of Building Design

The following are the five proposed styles of building design in the historic area:

Style-1: French Colonial Style in Laos

During the French colonial period (1893-1941), many buildings of French architectural style were constructed, namely: National Library (1921), University of Health Science (unknown), Vietnam Center for Culture in the Lao PDR (this building was established as a printing office in 1920) among others.

About 100 French colonial buildings (FCB) exist in the historic area and are being used as residence, school, and office.

The main feature of the buildings in the historic area is the “office type” style, which does not have a terrace on the second floor. Some buildings had terraces on the second floor, but terraces were rebuilt for making rooms like the Vietnam Center. Most FCBs decayed and some of them are deserted houses. Some FCBs were demolished or repaired, but some parts like the wall color, roof design were not original, and ornament were changed to depending on the owner’s preference.

Some FCBs have been renovated and used as a hotel and part of embassy building. Such buildings form a part of the cityscape of the historic area. Tourists are interested in such old buildings, which became a tourist spot in the historic area. The FCBs are very important for tourism of Vientiane.

The FCBs are listed in the result of French survey (**Historic Buildings Inventory, France 2003 and the list is inserted in page-23**), preservation and rehabilitation of such buildings should be considered.



Photo1



Photo2



Photo3



Photo4

Style-2: Row House with Lao Style

Lao style building is classified into three categories: Lao traditional, Lao Payouk, and Lao colonial

Lao Traditional Building

Lao traditional building is made of wood, and such construction pattern is found all over in rural Lao. Characteristics of this style are a platform, outdoor stairs, and rectangular plan. For this type, underneath the building is normally not enclosed and upstairs is used as living space. The walls are made of planks of bamboo.

Lao Payouk Building

The ground floor of Lao Payouk building is made of brick and masonry and the upper floor is made of wood. The upper floor has terrace running the length of the facade with wooden railing.

Characteristics of this style are hip-and-gable roof structure and lattice window and door.

Lao Colonial Building

Lao colonial building can be considered a mixture of Lao Traditional style and French colonial style. The roof style is double pitched gabled-roof. Elements taken from French colonial building are wide opening with upright lintels. Pillar design is similar to French colonial style where pillar design is square and simple.

In this reference book, it is recommended to use Lao colonial building because it was built in the historic area and is mostly made of reinforced-concrete, while Lao traditional and Lao Payouk styles are made of wood and the ground floor is a warehouse



Photo: Lao traditional building



Photo: Lao Payouk building



Photo: Lao colonial building

or pen for livestock. Such building use does not match the ambiance and cityscape of the historic area.

In addition, traditional ornaments, characteristic handrail, and Lao original roof tiles are recommended.

Style-3: 60s Style in Laos

From 1960 to 1970, along the roadside of the historic area, a lot of reinforced concrete (RC) buildings was built. Such buildings were constructed from 1960, most of which are three or four stories and form the cityscape of the roadside. The uniqueness of this style is the part of the cross section (see photos at the right). If there are plans to reconstruct such buildings, special attention should be given to the design of the cross section and height of eaves of the first floor of both sides of the buildings.

Some 60s style buildings were remodeled, like the terrace being changed to room space. Photo-1 and Photo-2 show the remodeled and original building, respectively. Photo-3 is the original model but the wall color was changed.

Photo-4 was taken in 1959. Wall color was white, advertisement board was not on the wall, and modern sunshade was installed. Photo-5 shows the large advertisement board that were put on the wall and the penthouse was also constructed. The original “60s style in Lao” is characterized as building wall with very simple color and design with vertical and horizontal lines. The original design is recommended.

In addition, beautiful roadside trees were planted and electric wires were not impeding in the cityscape of roadside.



Photo1



Photo2



Photo3



Photo4: Setthathilath Street (1961)
(Source: Gonzalo Cancino FB)



Photo5: Setthathilath Street (2016)
(Source: JICA Development Team)

Style-4: Haussmannian Style in Laos

Haussmannian is from the name of a French statesman, Georges-Eugène Haussmann, commonly known as Baron Haussmann (French pronunciation: 27 March 1809 – 11 January 1891), who was the Prefect of the Seine Department in France and was chosen by Emperor Napoleon III to carry out a massive program of new boulevards, parks, and public works in Paris. “Haussmann style in Laos” means building design and style of the Haussmann era.

Building of Haussmannian style in Lao is five to seven-storey buildings whose design idea was copied from Haussmann style in Paris. Even though the architectural style does not follow the history of Vientiane Capital, it is a new type to be recommended to those who are planning new construction of five to seven-storey buildings in the center of the roadside of Vientiane Capital. The reason for recommending this type is to harmonize with other styles recommended (French colonial, row house with Lao Style, and 60s style in Laos).

Recently, many buildings have been constructed without considering the cityscape of the historic area. For example, the pillars are Greek formula Style and walls with strong color. Middle or high-rise buildings are increasing in the historic area. Such new building design must be harmonized with the surrounding cityscape. “Haussmann style” in the historic area is recommended for five to seven-storey buildings.



Photo1



Photo2



Photo3



Photo4

Photo 1-4: Cityscape of Paris
(Source:Book of Travels in Europe, Yoshinori Uchiyama, <http://www.uchiyama.info/kaigai/>)

Style-5: Building of Lao Style Roof

Most government buildings adopt traditional style roof. This roof design is similar temple roof. Such design is called “Curved Slope Roof”. In Lao, a temple has a force that lures people, and government offices are always for the people. The two meanings were fused together resulting to the roof design being adopted by government buildings.

In the reference book, this roof design is recommended for government buildings, large buildings (for example head office of a bank, a big company, and a public building), and for mid-rise buildings located in Lane Xang Street.

Recently, new generation of buildings were constructed. The design of roof and ornament of temple are being used for the new buildings. The photos at the right show the United Nations (UN) residence building located near Patou Xai. The roof style and ornament are “Lao style roof”, but building design is original and new.

“Lao style roof” is recommended as a new idea for roof styles like the UN residence. Lao traditional design, new generation of designs, and sensitivity of architects will fuse and create a new landscape of the historic area.



Photo1



Photo2



Photo3: (Source: HP, FRANCOIS GRECK ARCHITECT D.P.L.G., INTERIOR DESIGNER)



Photo4: (Source: HP, FRANCOIS GRECK ARCHITECT D.P.L.G., INTERIOR DESIGNER)

(List of Lao style old buildings in the historic area)

In 2013, the MICT -Department of Heritage (DH) resurveyed old buildings that are listed by the French Study Team that surveyed the historic area of Vientiane Capital in 2003. The Japan International Cooperation Agency (JICA) team updated the output of the 2013 survey. The DH has conducted a

survey limited to Lao traditional buildings. In the reference book, the buildings listed in the result of the investigation is defined as 'historic building'. In this section, three types of Lao traditional buildings are introduced.

Lao Traditional Buildings

According to the result of the French Study Team, Lao traditional-style old buildings located in Vientiane Capital were built from 1920 to 1950. These buildings are made of wood and raised-floor-style. In the list of 2016, 14 out of 25 buildings existed until 2013, while the 11 Lao traditional buildings were demolished in a span of three years (2013 to 2016).



Photo (Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)

Lao Traditional Buildings List

No.	Code of FS2003	Village Name
1	4	Watchan
2	23	Ditto
3	291	Ditto
4	85	Haiysork
5	92	Ditto
6	304	Ditto
7	305	Ditto
8	295	Khualuang
9	298	Ditto
10	178	Phualuang
11	186	Kaoyord
12	209	Simeuang
13	215	Phaxay
14	216	Ditto

(Source:JICA team based on the list of the survey 2016)



Photo1:Lao traditional building (Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)



Photo2:Lao traditional building (Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)

Lao Payouk Buildings

According to the result of the French Study Team, Lao Payouk style old buildings located in Vientiane Capital were built from 1920 to 1960. These buildings were formed by RC or brick for the first floor and of wood for the second floor. In the list of 2013, 34 buildings were listed. The JICA team updated the output of the 2013 survey. Twenty-four buildings exist in 2016.



Photo (Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)

Lao Payouk Buildings List

No.	Code of FS2003	Village Name
1	3	Watchan
2	38	Mixay
3	45	Ditto
4	46	Ditto
5	301	Haiysork
6	113	Anou
7	294	Khualuang
8	213	Kaoyord
9	229	Ditto
10	234	Ditto
11	176	Phiawat
12	208	Simeuang
13	237	Ditto
14	239	Ditto
15	243	Ditto
16	264	Ditto
17	198	Thatkhao
18	200	Ditto
19	201	Ditto
20	202	Ditto
21	204	Ditto
22	206	Phapho
23	246	Ditto
24	260	Beungkhayong

(Source: JICA team based on the list of the survey 2016)



Photo1: Lao Payouk Buildings
(Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)



Photo2: Lao Payouk Buildings
(Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)

Lao Traditional with Colonial Influence

According to the result of the French Study Team, Lao traditional old buildings with colonial influence located in Vientiane Capital were built from 1930 to 1960. These buildings are formed using RC or bricks for the first floor and terraces are installed at the second floor. In the list of 2013, 40 buildings are listed. The JICA team updated the output of the 2013 survey. Thirty-two buildings exist in 2016.



Photo (Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)

Lao Colonial Buildings List

No.	Code of FS2003	Village Name
1	7	Watchan
2	10	Ditto
3	13	Ditto
4	25	Ditto
5	27	Ditto
6	35	Ditto
7	16	Mixay
8	64	Ditto
9	129	Ditto
10	84	Haiysork
11	86	Ditto
12	90	Ditto
13	106	Anou
14	107	Ditto
15	108	Ditto
16	114	Ditto
17	115	Ditto
18	299	Khualuang
19	302	Ditto
20	306	Ditto
21	189	Kaoyord
22	191	Ditto
23	231	Ditto
24	256	Ditto
25	171	Phiawat
26	172	Ditto
27	173	Ditto

(Source:JICA team based on the list of the survey 2016)

No.	Code of FS2003	Village Name
28	174	Ditto
29	210	Thatkhao
30	212	Phapho
31	245	Ditto
32	247	Ditto



Photo1:Lao Payouk Buildings (Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)



Photo2:Lao Payouk Buildings (Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)

French Colonial Buildings

The list of French colonial buildings was collected in 2003 by French Study Team. According to the result of the French Study Team, French colonial style old buildings located in Vientiane Capital were built from 1920 to 1960. These buildings are formed using RC or bricks for the first floor, and some buildings corridors are installed at the ground floor. In the list of 2003, Ninety-nine buildings are listed.

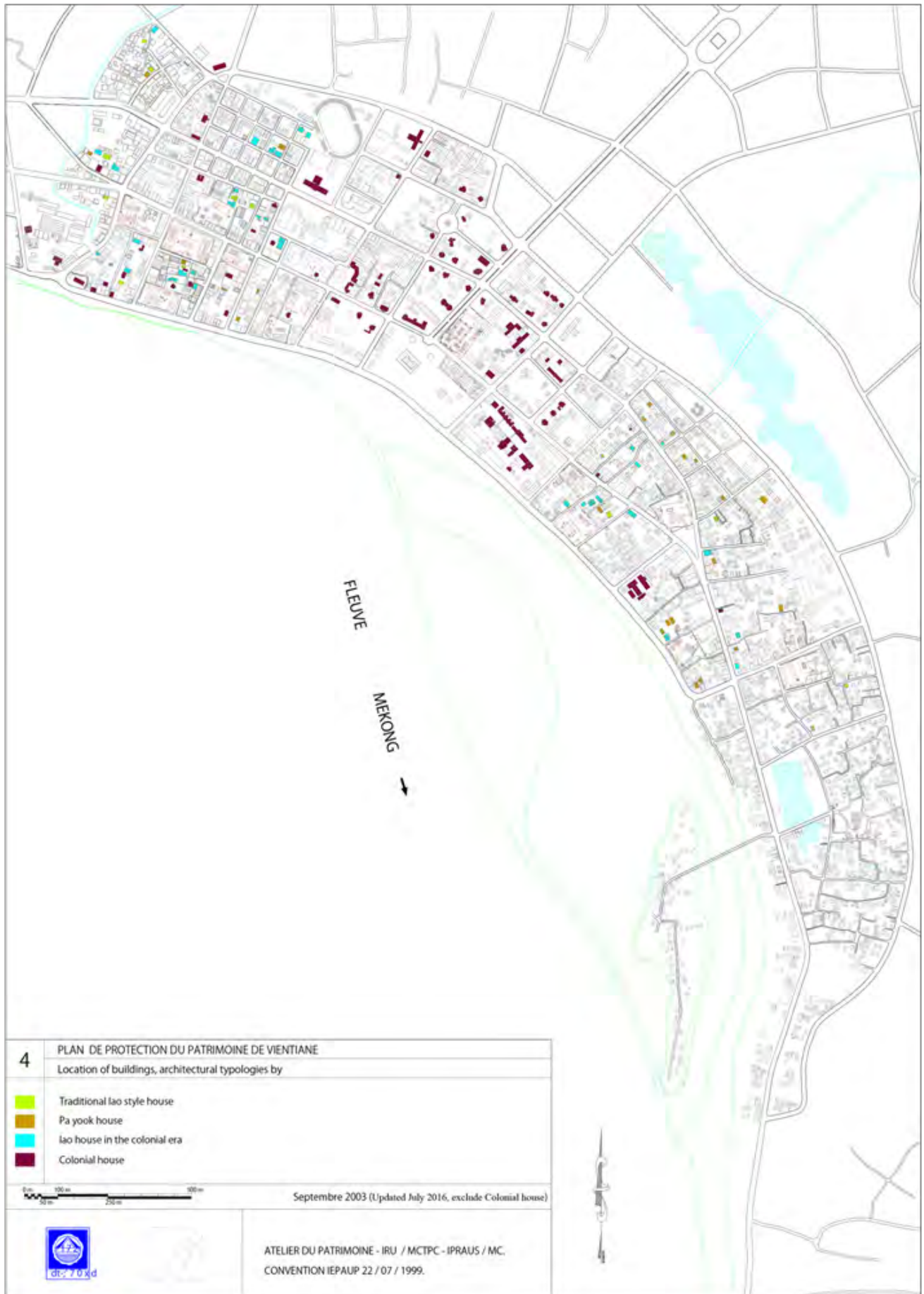


Photo (Source: Vientiane, portrait d'une ville en mutation: Chayphet Sayarath)

French Colonial Buildings List

No.	Code of FS2003	Village Name	No.	Code of FS2003	Village Name	No.	Code of FS2003	Village Name
1	5	Watchan	34	136	Ditto	67	223	Ditto
2	12	Ditto	35	137	Ditto	68	224	Ditto
3	15	Ditto	36	140	Sisaket	69	225	Ditto
4	21	Ditto	37	142	Ditto	70	226	Ditto
5	24	Ditto	38	143	Ditto	71	227	Ditto
6	31	Ditto	39	144	Ditto	72	242	Simuang
7	33	Ditto	40	145	Ditto	73	249	Phrapho
8	37	Mixay	41	146	Ditto	74	251	XiengGneun
9	48	XiengNheun	42	147	Ditto	75	257	VatChanh
10	52	Ditto	43	148	Ditto	76	261	Ditto
11	53	Ditto	44	149	Ditto	77	262	Sissaket
12	54	Ditto	45	151	XiengGneun	78	265	Simuang
13	55	Ditto	46	153	Ditto	79	266	Ditto
14	56	Ditto	47	154	Ditto	80	267	Ditto
15	59	Ditto	48	155	Phiawat	81	268	Sissaket
16	60	Ditto	49	159	Sissatanark	82	274	XiengGneun
17	61	Ditto	50	161	Ditto	83	275	Ditto
18	62	Mixay	51	162	MHS	84	276	Ditto
19	68	Ditto	52	163	Sissatanark	85	277	Bungkhagnung
20	70	Sisaket	53	165	MHS	86	280	Kaognot
21	83	Ditto	54	167	Sissatanark	87	281	Ditto
22	86	Haisok	55	182	Kaognot	88	282	Ditto
23	89	Ditto	56	184	Ditto	89	283	Kaognod
24	96	Anou	57	192	Simuang	90	284	Ditto
25	122	Ditto	58	193	Ditto	91	285	Ditto
26	124	XiengGneun	59	194	Thatkhao	92	286	Ditto
27	126	Sisaket	60	195	Ditto	93	287	Ditto
28	127	Mixay	61	217	Sisaket	94	288	Ditto
29	128	Ditto	62	218	Ditto	95	289	Sithane
30	130	Sisaket	63	219	Ditto	96	290	Ditto
31	131	Ditto	64	220	Ditto	97	292	Khoualuang
32	133	Ditto	65	221	Kaognod	98	307	HaiSok
33	134	Ditto	66	222	Ditto	99	308	Sissaket

(Source: JICA Team based on the survey 2003, portrait d'une ville en mutation)



Map7: Location Map of old Buildings

(Source: JICA team based on the survey 2016 and 2003 (French Colonial))

2. Low and Middle-Rise Building

2.1. French Colonial Style in Vientiane

In Vientiane Capital, the oldest French colonial style building was built in 1911. Historically, French architects worked in Laos during French colonial era. French colonial buildings were constructed first in Vientiane, then in Luang Prabang.

According to one theory, carpenters and plasterers of Vietnam also started to work in Laos during French colonial era, too. Vietnamese workmen constructed French colonial buildings in Vientiane.

The characteristics of French colonial buildings in Vientiane are the following:

- The dimension of the pillar is square, in most cases, the pillars are decorated.
- The shapes of roof are 'gabled roof', 'hipped roof', and 'hip gable roof'.
- Almost in all cases, arch-shaped ornaments are installed.
- In many cases, corridor is not installed at the ground floor of French colonial style buildings in Vientiane Capital.
- The original wall color is mat-white in Vientiane.



Photo1:Perspective View
(Approach, Wall and Plants)



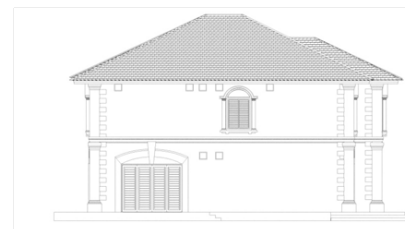
Photo2:Perspective View
(Entrance)



Photo3:Perspective View
(Decoration of Pillar and Window)



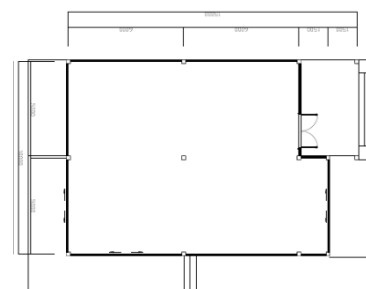
Elevation1: Front



Elevation3: Right

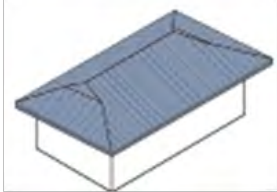
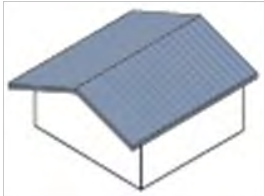
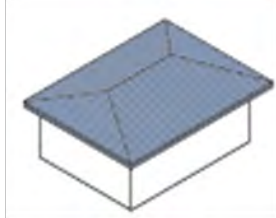





Elevation2: Back







Top plan: 1st Floor





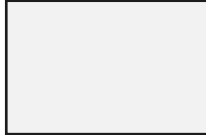


Roof Style

Hip Gable Roof	Gabled Roof	Hipped Roof
		
 <p data-bbox="269 884 485 909">The Old National Library</p>	 <p data-bbox="751 884 839 909">Residence</p>	 <p data-bbox="1102 884 1318 909">Ministry of Public Health</p>

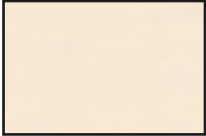





Roof Color and Material

Recommendation	
<p data-bbox="225 1200 687 1357">If there are plans to construct original French colonial style buildings, it is recommended to use roof tiles made in Lao (right photo). Heritage buildings in Luang Prabang used these tiles for renovation.</p> <p data-bbox="225 1359 687 1516">Roof tiles made in Thailand are not original but the material is preferred than Lao tile. Roof tile made in Thailand is cheaper than Lao tile. (Information from Ardeco, architect consultant in Vientiane)</p>	 <p data-bbox="831 1532 956 1556">9.4R/4.5/14.0</p>  <p data-bbox="1158 1532 1334 1556">Lao Traditional Tiles</p>
Method of roofing with tiles	
<p data-bbox="225 1718 687 1874">Right photo(photo1) is a Lao traditional tile and left photo is the back of the roof of Sisaket Temple. Sisaket Temple is the oldest building in Vientiane. The structure of roof tiles of Sisaket is traditional style.</p> <p data-bbox="225 1877 687 2000">The existing roof material of French colonial style is not original. If there are plans to construct original style, it is recommended to use Lao traditional tiles.</p>	 <p data-bbox="751 2036 1096 2060">Photo1:Roof with Tiles (Sisaket Temple)</p>  <p data-bbox="1142 2036 1386 2060">photo2:Lao Traditional Tiles</p>

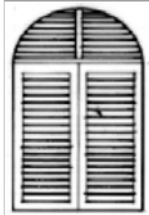
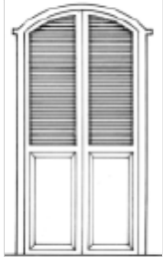

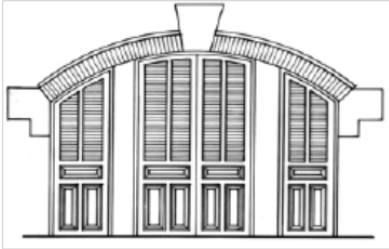
Wall Color

Mat-White (Obligation)	
<p>The wall color must be mat-white. (Detail LUP/ZC of Historic Area, Item 12. External Feature 'color') The slightest hint of color may be added into mat-white. (Example) This building is the office of Lao Telecom. The existing wall color is yellow. This is the company color of Lao Telecom. This is a case in which change of color of the wall. Original color of wall is white.</p> <div style="text-align: center;">  <p>Photo1: Office of Lao Telecom</p> </div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>N10.0</p>   <p>Photo2: Residence (Vacant)</p> </div> <div style="text-align: center;">  <p>N9.0</p>   <p>Photo3: Hotel (New Building)</p> </div> </div>





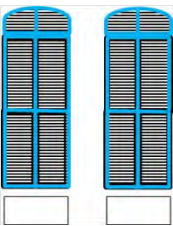
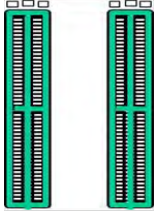
Wall Surface Condition

Recommendation	
<p>Smooth painting and wavelets painting are recommended. Plaster is best material for wall surface coating, but it is difficult to use Lao traditional plaster (droppings + straw + lime) because of weak point of traditional plaster (weak to rain).</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Figure1: Smooth Painting</p> </div> <div style="text-align: center;">  <p>Figure2: Wavelets Painting</p> </div> </div>
NOT Recommended	
<p>The four figures on the right boxes are not recommended surface condition. To paint such method on brick or wooden wall are not recommended (figure3&4). Thick spray-on coating for walls and lighting spray coating are not recommended (figure5&6).</p>	<div style="display: grid; grid-template-columns: 1fr 1fr; gap: 10px;"> <div style="text-align: center;">  <p>Figure3: Painting on Brick wall</p> </div> <div style="text-align: center;">  <p>Figure4: Painting on Wooden wall</p> </div> <div style="text-align: center;">  <p>Figure5: light spray-on coating</p> </div> <div style="text-align: center;">  <p>Figure6: Thick spray-on coating</p> </div> </div>

Window Design

Recommendation	
<p>One of the characteristics of French colonial style window design is the shape. French colonial style window has an arch part and a square part. French colonial style window is double-layered. If viewed from the outside, it is a wooden blindfold, while in the inside, it is glass.</p> <p>In the era where air conditioner is not popular, opening the inside of the window allows the wind to get through inside the room.</p>	 <p>French colonial style window 1</p>  <p>French colonial style window 2</p>
<p>French colonial style ornament of the window is a characteristic item. The ornaments are installed at the top of the arch and both sides.</p>	  <p>(Source: Luang Prabang AN ARCHITECTURAL JOURNER, FRANCOIS GRECK ARCHITECT D.P.L.G., INTERIOR DESIGNER and Luang Prabang Guidebook Fascicule No.2: Detail Architecturaux)</p>

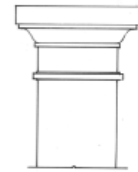
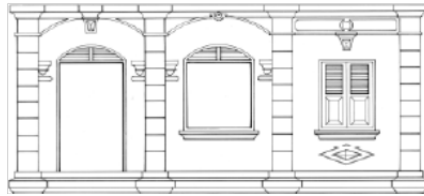
Reference windows

Recommended design of window	
<p>Reference window forms two shapes, upper is gently curve and lower part is rectangular. The structure is double-glazed and out side window has shade.</p>	<p>This is an entrance of Ministry of Public Health. Window design and color are harmonize with pillar, decoration and door</p>
  <p>Location: around French Embassy</p>	 <p>Location: Ministry of Public Health</p>
 	

Pillar Design

Recommendation

French colonial style pillar is square and cubic type. This pillar is decorated with some ornaments that are installed at both the base and top of the pillar. It is simple design and the pillar does not directly connect two or more floors, and not use “column of balloon framing”.



French colonial style pillar

Capital

(Source: Luang Prabang Guidebook Fascicule No.1: TYPES ARCHITECTURAUX)



Photo 1



Photo 2



Photo 3



Photo 4

Vent Design

Recommendation

Vent is an important item of building scape. Personal designed vent was installed under the roofs in Vientiane.



(Source: Luang Prabang AN ARCHITECTURAL JOURNER, FRANCOIS GRECK ARCHITECT D.P.L.G., INTERIOR DESIGNER)



Photo 5



Photo 6



Photo 7

2.2. Row House with Lao Style

In this reference book, detail of row house looks like Lao Traditional. In Vientiane Capital, old buildings of Lao Traditional were classified three groups. The titles of the three groups are 'Lao traditional', 'Lao Payoutk', and 'Lao colonial'. Historically, the oldest Lao style building was established in 1920 in Vientiane Capital.

Lao traditional buildings are made of wood. Lao Payoutk buildings are formed from RC or brick (first floor) and wood (first floor) and Lao colonial buildings are formed by RC or brick (first floor) and corridors are installed at the first floor. The characteristics of 'Row House of Lao Style' buildings in Vientiane are the following:

- The shapes of roof are 'Gabled Roof' and 'Hipped Roof'.
- Old buildings are made of wood. Such buildings are aging, relatively, new buildings are constructed by RC, or the first floor is RC or brick, the second floor is made of wood.
- Corridor is installed at the ground floor of Lao colonial style buildings and terrace is installed at the second floor of the building.
- The wall color is mat-white. (that is a color of plaster). Woods are used as material of the wall.
- Lao traditional building's handrail pattern and ornaments of eaves have beautiful designs and characters.



Photo1:Perspective View

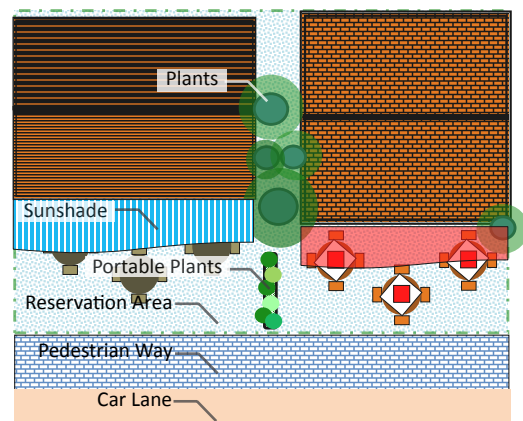
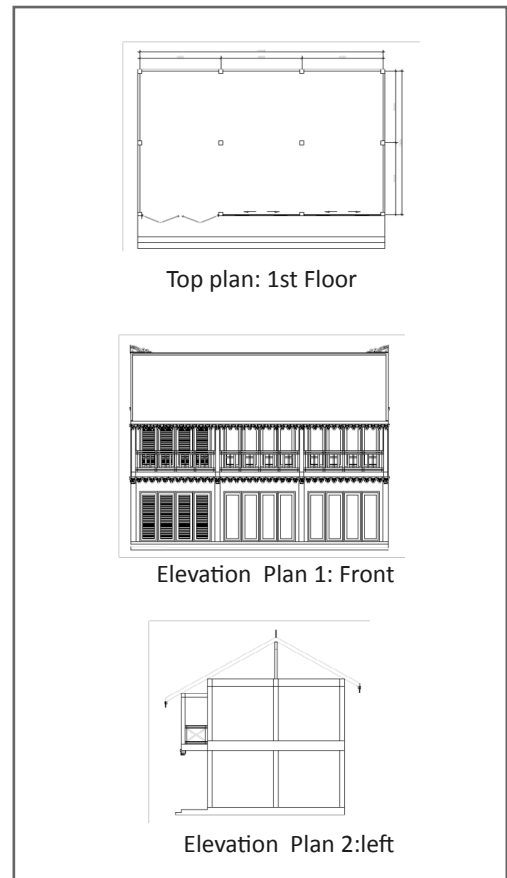


Photo2:Plot Plan

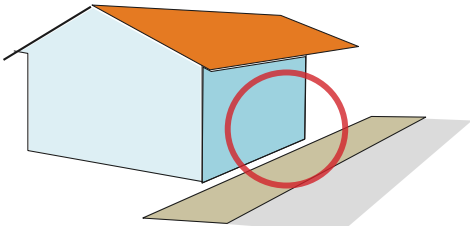
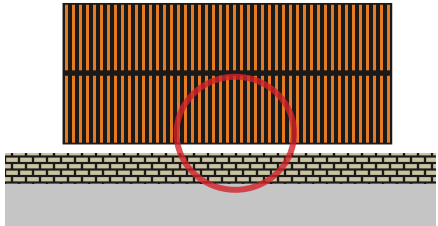
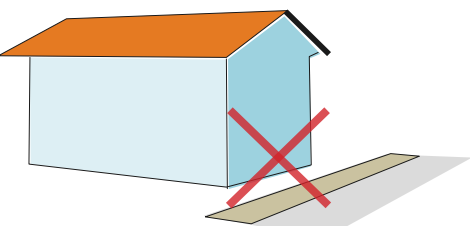
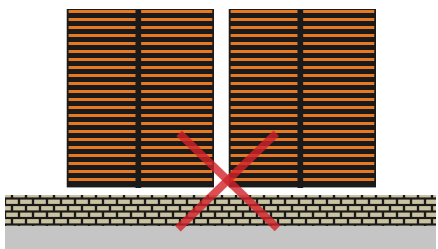


Photo3

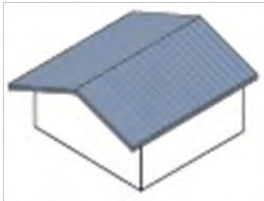

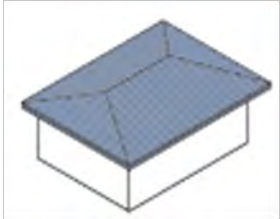

Layout of 'Row House with Lao Style'

In the historic area, almost all entrances to 'row house with Lao style' buildings were constructed parallel to the ridge of the roof. Roadside cityscape (faces of buildings in front on the street) of the historic area is formed by this plot pattern.





In order to keep the cityscape in its existing condition, the reference book recommends this plot pattern (entrance to building constructed in parallel to the ridge, usually on the long side of the building).

Recommendation	
<p>(Image.1) The entrance to a building constructed in parallel to the ridge of the roof, usually on the long side of the building</p>  <p>Image.1: Perspective Veiw</p>	<p>This plot pattern is recommended in the historic area.</p>  <p>Plot plan</p>
Not recommended	
<p>(Image.2) The entrance to a building constructed in one of the sides of the building and the axis of approach is at right angle to the roof ridge</p>  <p>Image.2: Perspective Veiw</p>	<p>This plot pattern is not recommended in the historic area.</p>  <p>Plot plan</p>


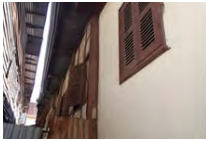
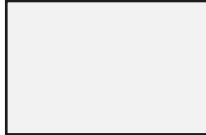





Roof Style

Recommendation	Gabled Roof	Hipped Roof
<p>Generally, Row house with Lao style building's roof design is gabled or hipped. Gabled roof is recommended for two-storey buildings in the road side form cityscape of the historic area and gabled roofs will form unity of the buildings located in the road side.</p>	  <p data-bbox="695 896 900 918">Residence(coffee shop)</p>	  <p data-bbox="1165 896 1254 918">Residence</p>

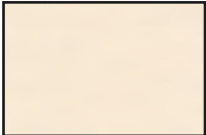
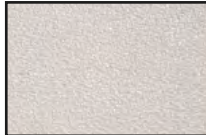




Roof Color and Material

Recommended Roof Color	
<p>Light brown color is recommended for the roof of "Lao style row house". Original Lao roof tiles are recommended.</p>	 <p data-bbox="823 1424 948 1447">9.4R/4.5/14.0</p>  <p data-bbox="1152 1424 1327 1447">Lao Traditional Tiles</p>
Recommended Roof Material	
<p>For construction of original Lao style building, roof tile made in Lao should be used (right photo). Roof tile made in Thailand is not original, but the material is lighter than Lao tile. Roof tile made in Thailand is cheaper than Lao tile. (Information from Artdeco Architect Consultant in Vientiane).</p>	 <p data-bbox="769 1930 1078 1953">Roof tiles made in Laos or Thailand</p>  <p data-bbox="1152 1930 1327 1953">Lao Traditional Tiles</p>

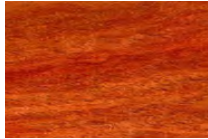


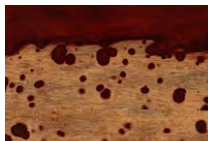
Wall Color

Mat-White (Obligation)	
<p>Wall color must be mat-white. (Detailed LUP/ZC of the Historic Area Item 12. External Feature 'color') The slightest hint of color may be added into mat-white.</p> <p>Recommendation</p> <p>Mahogany and light brown are recommended for wall color of wood.</p> <p>Mahogany is the same as dark brown. Mahogany is the color of a mahogany tree. Light brown is the color of Chinese Quince. These materials of wood are of high quality. It is not recommended to paint the face of plywood only.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>N10.0</p>  <p>Residence</p> </div> <div style="text-align: center;">  <p>N9.0</p>  <p>Residence</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>5.3R/1.5/4.4</p>  <p>Recommended wooden wall</p> </div> <div style="text-align: center;">  <p>3.4R/4.9/7.5</p>  <p>Recommended wooden design</p> </div> </div>




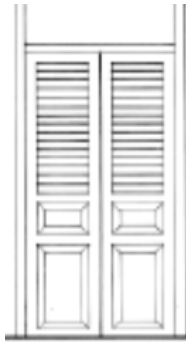



Wall Surface Condition

Recommendation	
<p>Smooth painting and wavelets painting are recommended. Plaster is best material for wall surface coating, but it is difficult to use Lao traditional plaster (droppings + straw + lime) because of weak point of traditional plaster (weak to rain).</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Figure1: Smooth Painting</p> </div> <div style="text-align: center;">  <p>Figure2: Wavelets Painting</p> </div> </div>
NOT Recommended	
<p>The four figures on the right boxes are not recommended surface condition. To paint such method on brick or wooden wall are not recommended (figure3&4).</p> <p>Thick spray-on coating for walls and lighting spray coating are not recommended (figure5&6).</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Figure3: Painting on Brick wall</p> </div> <div style="text-align: center;">  <p>Figure4: Painting on Wooden wall</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>Figure5: light spray-on coating</p> </div> <div style="text-align: center;">  <p>Figure6: Thick spray-on coating</p> </div> </div>





Wall Material

Recommendation			
<p>Mat-White wall with smooth painting is recommended. If you use wood material to wall, Chinese quince, walnut, mahogany, and narra are recommended as wall materials. These woods are of high quality and less susceptible to damages from termites.</p>			
	Chinese Quince(Tree)	Mahogani	
			
	Walnut	Narra	



Window Design

Recommendation				
<p>Window and door design of “Lao style row house of” is square and have ventilator with lattice. Root of these materials design is Lao traditional.</p>				
				
Lao Ventilator	Window Design 1	Window Design 2	Door Design 1	Door Design 2
<p>(Source: Luang Prabang AN ARCHITECTURAL JOURNER, FRANCOIS GRECK ARCHITECT D.P.L.G., INTERIOR DESIGNER)</p>				
<p>Good examples of window and door design of “Lao style row house” are shown in the Photos(photo1&2). Some slatted shutters were painted blue. This is the original color of the old building.</p>				
				
Photo1: 3 Double swing window		Photo2: Double swing window		





Eave Design

Recommendation	
<p>Eaves were not installed to the original design of “Lao style row house”. But almost Lao style row house install eaves after construction because of protection for wall and window. This reference book, we are convinced of necessity of eaves.</p> <p>This is the recommended eave design of this type of building because there is a distinct rainy season from May to November and strong rainwater will directly hit the window without eaves. Eaves roof tiles are the same with roof tiles and traditional ornament will be installed on the edge of eaves.</p>	 <p>Eave1</p>  <p>Eave2</p>  <p>Eave3</p>  <p>Concrete Eave</p>

Ornament

Recommendation	
<p>One of the characteristic item of Lao traditional building is the ornament of eaves. Many design and formed ornaments are installed, and many wood-carved plants are made in an old factory. It is recommended to install such decorations.</p>	 <p>Ornament in Market</p>  <p>Ornament With Tiles Roof</p>

Handrail

Recommendation	
<p>Personal designed handrail on the terrace makes a characteristic view to an original building shape of Vientiane. It is recommended to use such designed handrail and to make an original handrail in the row house.</p> <p>Almost all handrail designs are patterns formed in vertical and horizontal lines. Diagonal line and circle are not being used. Mat-white and wooden color without painting are used for the color of the handrail.</p>	 <p>Handrail Type 1</p>  <p>Handrail Type 2</p>  <p>Handrail Type 3</p>  <p>Handrail Type 4</p>

2.3. 60s Style in Laos(60s S)

In Vientiane Capital from 1960 to 1970, many public facilities, compartments, villas, and residences were constructed. Buildings of this period were made of RC and used bricks for wall material. Such buildings are located in the roadside of Samsenthai, Setthathilath, and Khun Bu Lom streets. The characteristics of these buildings are the following:

- These buildings are two to four stories;
- Some buildings were rehabilitated and were changed to dormitory, technical school, and hotels;
- Some buildings have been rehabilitated and wall color was changed, although the original wall color is mat-white;
- Cover for advertisement and sign were installed in some buildings located in the roadside of the arterial road;
- Roof style is flat, but some buildings put shelter on the flat roof.; and
- New walls for blinds were put on the terraces. The patterns of the new walls were based individual preferences.



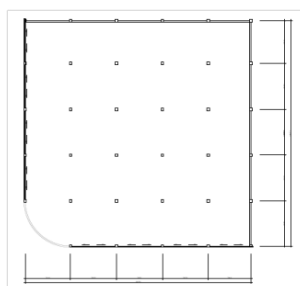
Photo1:Perspective View



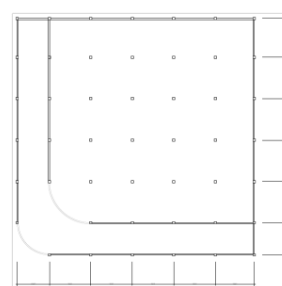
Photo2:Vientiane 1959



Photo3:Vientiane 1960-1970



Top plan: 1st Floor



Top plan: 2nd Floor



Elevation Plan 1



Elevation Plan 2

The 60s styles in Laos buildings are important factors for the historic area's cityscape.

Especially in a road crossing, 60s style building forms a gentle curve surface and this forms Vientiane's characteristic cityscape.

This figure (top of page) is a perspective design of a 60s building, and the second and third photos show the original condition of a 60s building. White wall and simple design and without large advertisement building is original style. The photo4 and photo5 show the existing condition of the 60s building. Change in wall color and enlarged penthouse on the top of the buildings can be seen. Large advertisements were also installed.

In this reference book, it is recommended to use original color and style.





Photo4:Vientiane 2016









Photo5:Vientiane 2016

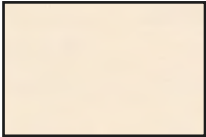





Roof Style

Recommendation	Flat Roof
<p>Flat roof (original style) is recommended. Temporary house (penthouse) that was installed after construction is not recommended. Design, color, and material of penthouse are given attention for its 60s building design.</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Flat Roof</p> </div> <div style="text-align: center;">  <p>60s Style Building</p> </div> </div>



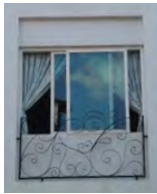
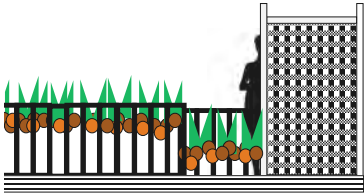
Wall Color

Mat-White (Obligation)	
<p>Wall color must be mat-white. (Detailed LUP/ZC of the Historic Area, Item 12. External Feature 'color') The slightest hint of color may be added into mat-white</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>N10.0</p>   <p>Residence</p> </div> <div style="text-align: center;">  <p>N9.0</p>   <p>Residence</p> </div> </div>



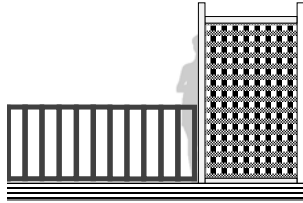

Wall Surface Condition

Recommendation	
<p>Smooth painting and wavelets painting are recommended. Plaster is the best material for wall surface coating.</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Figure1: Smooth Painting</p> </div> <div style="text-align: center;">  <p>Figure2: Wavelets Painting</p> </div> </div>
NOT Recommended	
<p>The four figures at the right boxes are not recommended surface condition. To paint on brick wall is not recommended (figure3&4). Thick spray-on coating for walls, lighting spray coating is not recommended (figure5&6).</p>	<div style="display: grid; grid-template-columns: 1fr 1fr; gap: 10px;"> <div style="text-align: center;">  <p>Figure3: Painting on Brick wall</p> </div> <div style="text-align: center;">  <p>Figure4: Painting on Wooden wall</p> </div> <div style="text-align: center;">  <p>Figure5: light spray-on coating</p> </div> <div style="text-align: center;">  <p>Figure6: Thick spray-on coating</p> </div> </div>

Window Design

Recommendation	
<p>Window and handrail design are important items of a 60s building.</p> <p>In the upper left photo(Photo1), length and breadth lines formed simple design and harmonize with the window and door design.</p> <p>In the lower left photo(Photo3), circle pattern is harmonized with white curtain and white frame. In the upper right photo(Photo2), compressor unit are hidden in the rough mesh net.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Photo1: Handrail and Window</p> </div> <div style="text-align: center;">  <p>Photo2: Rough Mesh net</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>Photo3: Circle Pattern</p> </div> <div style="text-align: center;">  <p>Figure1: Handrail and Plants</p> </div> </div>

Wall Decoration

Recommendation	
<p>The 60s building sunshade board design is characteristic. This sunshade design is the original design of 60s building.</p> <p>In the upper photos(Photo1&2), sunshade and handrail have the same design. The lower photo (Photo3) shows a new building. The building owner adopted 60s sunshade design to the new building. Sunshade is good for cutting sunshine and protection from rain.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Photo1:Residence</p> </div> <div style="text-align: center;">  <p>Photo2:Residence</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>Figure1: Handrail and Sunshade</p> </div> <div style="text-align: center;">  <p>Photo3:Residence</p> </div> </div>

Eave Design

Recommendation

The function of eave is to provide sunshade and to prevent rain drops from entering the building.

Upper and lower right photos are retro-fitted eaves. The design is "art deco" style. In using a slow curve line, it is harmonious with the 60s style building.

In the upper left photo, fanlight eave on the top of entrance is harmonious with the staircase of the entrance.

In the lower left photo, decoration eaves are installed on the height of first story.



Photo1



Photo2

3. Middle and High-Rise Building

3.1. Haussmannian Style in Laos

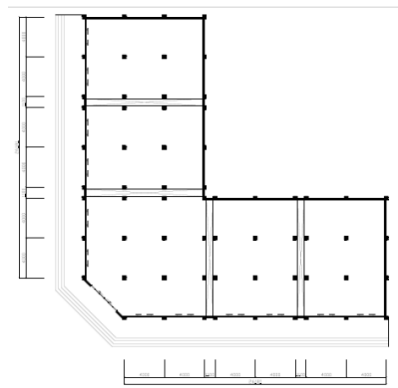
In Vientiane Capital, this style in buildings is a newcomer. The design of these buildings is not related to the transition of the historic architecture of Laos.

In the reference book, reasons for recommending the 'Haussmannian style in Laos are the following:

- Recently, new building with long pillars of Ionic and Corinthian Greek style decoration (length is from ground level to two or three stories) were placed at the entrance. In Lao history, such architectural style does not have a historical background. Haussmannian style does not have a historical background, but this style harmonizes with historic area and French Colonial and Lao Traditional buildings.
- Haussmannian style is moderately harmonious with the historic area's image wrapped in prosperity and kindness.
- Monotonous design and flashy colors of the buildings are not fit in the historic area.
- In the historic area, many French colonial buildings are located and French style design is popular in the historic area.
- Haussmannian Style, floor height of upper story must be lower than that of lower story. This is one of the essential rules and style. Such rules are recommended.



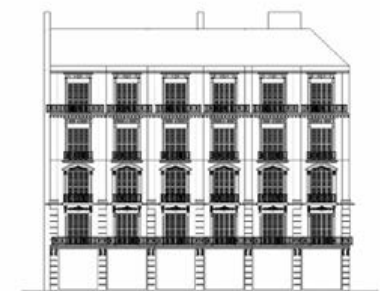
Photo1:Perspective View



Top plan: 1st Floor





Elevation Plan 1





Elevation Plan 2



Roof Style

Recommendation	Haussmanian Style Roof
<p>The style of trapezium with window for attic is recommended.</p> <p>Roof color will be changed to wall color.</p>	<div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: center;">(Source:Book of Travels in Europe, Yoshinori Uchiyama, http://www.uchiyama.info/kaigai/)</p>

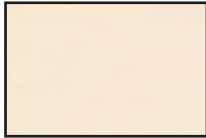





Roof Color

Recommendation		
<p>Dark blue and dark brown are recommended for roof color.</p> <p>It is recommended that roof color is used the different color to the color of wall.</p>	 3.8PB/3.8/7.6	 2.5R/2.3/5.4

Roof Color

Mat-White (Obligation)		
<p>Wall color must be mat-white. (Detailed LUP/ZC of the Historic Area Item 12. External Feature 'color') The slightest hint of color may be added into mat-white.</p>	 N10.0	 N9.0

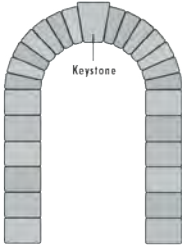


Wall Surface Condition

Recommendation		
<p>Smooth painting and wavelets painting are recommended. Plaster is the best material for wall surface coating.</p>		
<p>Figure1: Smooth Painting</p>	<p>Figure2: Wavelets Painting</p>	
NOT Recommended		
<p>The four figures at the right boxes are not recommended surface condition. To paint on brick wall is not recommended (figure3&4).</p>		
<p>Thick spray-on coating for walls, lighting spray coating is not recommended (figure5&6).</p>		
<p>Figure3: Painting on Brick wall</p>	<p>Figure4: Painting on Wooden wall</p>	
<p>Figure5: light spray-on coating</p>	<p>Figure6: Thick spray-on coating</p>	


Window Design

Recommendation		
		
<p>(Source: Book of Travels in Europe, Yoshinori Uchiyama, http://www.uchiyama.info/kaigai/)</p>		

Decoration Design

Recommendation		
		
Figure: Keystone	Photo1: Decorative Keystone	Photo2: Decorative Keystone

Decoration Design

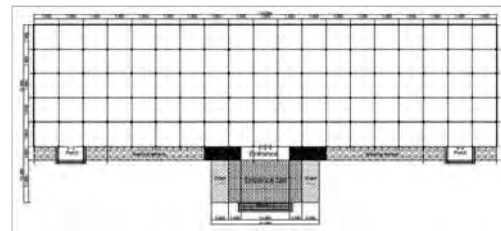
Recommendation		
<p>The shape of pillar is square. Jointed pillar is recommended. Through pillar is not recommended. Simple design of decoration names "dorian order" is recommended. Vertical line of pillar is recommended.</p>		
	Photo1: Banque Franco Lao	Photo2: Banque Franco Lao

3.2. Building of Lao Style Roof

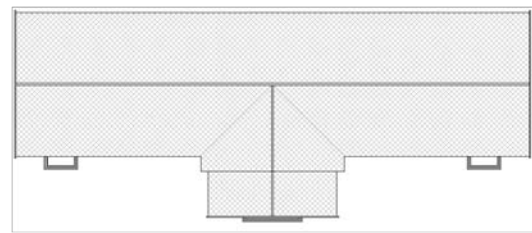
In Vientiane Capital, government buildings were classified based on this style. Image of these existing buildings are dignified.

In the reference book, such image will be changed to 'openness' and 'sense of closeness'. The following items are recommended to new government buildings, banks, and office buildings:

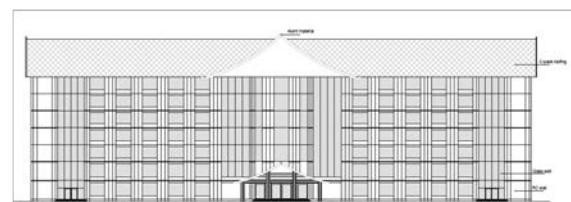
- By using glass curtain wall, residents of Vientiane Capital can see the inside of the building and it will show 'openness' and 'sense of closeness' to people.
- In order to maintain the dignity of the government facilities, the roof of the imperial crown style (Lao style temple roof) will be installed, but it is recommended to use right and strong materials for roof.
- Color of glass of windows are not used this style of building.



Top plan: 1st Floor



Roof plan





Elevation Plan



Photo1:Perspective View

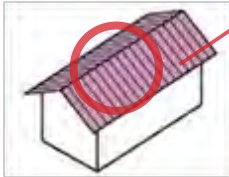
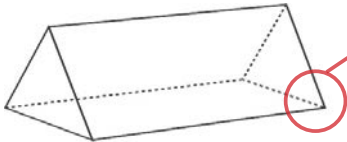
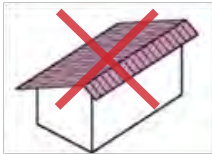
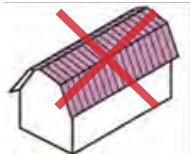
Roof Style

Recommendation	Ornamental Roof (Lao Wat Style Roof)
<p>Lao Wat style roof is recommended and respected. This roof style became a landmark of the Lao government building, and head offices of private companies must maintain its dignity.</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Photo1: Headquarter of Public Security Vientiane Capital</p> </div> <div style="text-align: center;">  <p>Photo2: SINOHYDRO GROUP LTD.</p> </div> </div>



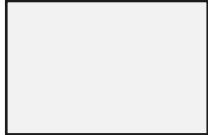

Roof Color

Recommendation	
<p>Low chrome and brightness color is recommended. Muted colors are recommended.</p>	<div style="display: grid; grid-template-columns: 1fr 1fr; gap: 10px; text-align: center;"> <div style="background-color: #336699; width: 60px; height: 60px; margin: 0 auto;"></div> <p>3.8PB/3.8/7.6</p> </div> <div style="display: grid; grid-template-columns: 1fr 1fr; gap: 10px; text-align: center;"> <div style="background-color: #800000; width: 60px; height: 60px; margin: 0 auto;"></div> <p>2.5R/2.3/5.4</p> </div> <div style="display: grid; grid-template-columns: 1fr 1fr; gap: 10px; text-align: center;"> <div style="background-color: #90EE90; width: 60px; height: 60px; margin: 0 auto;"></div> <p>3.8PB/3.8/7.6</p> </div> <div style="display: grid; grid-template-columns: 1fr 1fr; gap: 10px; text-align: center;"> <div style="background-color: #FF8C00; width: 60px; height: 60px; margin: 0 auto;"></div> <p>2.5R/2.3/5.4</p> </div>




Shape of Roof

Recommendation	
<p>Article 15 "Building Height" (1. (b) (i)) (i) Lao traditional roof, which has: slopes with 30-60 degrees, and symmetric elevation.</p>	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; align-items: center; margin-bottom: 20px;">  <div style="margin-left: 10px;">Symmetric Elevation</div> </div> <div style="display: flex; justify-content: space-around; width: 100%;"> <div style="text-align: center;">  <p>Slope of 30-60 Degree</p> </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> </div>
<p>Figure1: The degree of the angle</p>	<p>Figure2: Shape of roof</p>





Wall Color

Mat-White (Obligation)	
<p>Wall color must be mat-white. (Detailed LUP/ZC of the Historic Area, Item 12. External Feature 'color') The slightest hint of color may be added into mat-white</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>N10.0</p>  <p>Photo1</p> </div> <div style="text-align: center;">  <p>N9.0</p>  <p>Photo2</p> </div> </div>

Wall Surface Condition

Recommendation	
<p>Glass wall structure is recommended. During evening time, offices, commercial establishments, and restaurants turn on their lights and the streets become bright. (Photo1,2&3, only windows style are recommended.)</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Photo1</p> </div> <div style="text-align: center;">  <p>Photo2</p> </div> <div style="text-align: center;">  <p>Photo3</p> </div> </div>

Wall Surface Condition

Recommendation	
<p>Traditional eave design is recommended. Characteristic eave design becomes the building's originality. New generation design of eave is recommended (For example, UN residence, photo3&4).</p>	<div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="text-align: center; width: 45%;">  <p>Photo1</p> </div> <div style="text-align: center; width: 45%;">  <p>Photo2</p> </div> <div style="text-align: center; width: 45%;">  <p>Photo3</p> </div> <div style="text-align: center; width: 45%;">  <p>Photo4</p> </div> </div> <p style="text-align: center; font-size: small;">(Source: HP, FRANCOIS GRECK ARCHITECT D.P.L.G., INTERIOR DESIGNER)</p>

III. Advertisement and Design

1. Design

Advertisements and signs are the most effective way to put appeal on shops, restaurants, and offices for attracting tourists and local people to visit the historic area.

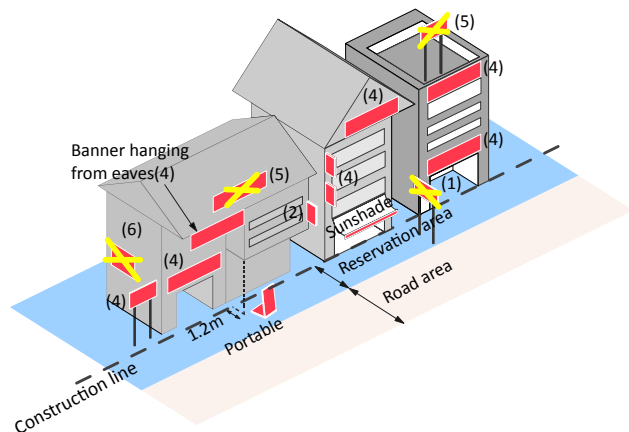
However, when installing advertisements and signs in the historic area or Vientiane Capital, attention should be given to the

Detailed Zoning Code (Article 8 Item 12. External Feature). The outline of the Detailed Zoning Code for advertisements and signs are shown below. In addition, recommendation of color, mascot, font, and right are illustrated in this reference book.

1.1. Requirements from the Viewpoints of Location

Detailed Zoning Code covers the following:

- To prohibit the placing of advertisement and sign on the roof of the building (5);
- To limit the placing of advertising material protruding from the building (2);
- To prohibit the placing of advertisement on the reservation area (1);
- It is possible to set-up a portable (removable) advertising board (restaurant menu, list of charges of laundry, etc.) in the reservation area;



location			In building site (Including vacant land)		Out of building site(*2)
			Normal building site	Reservation area(*1) Area(H ≥ 3m, W ≤ 1.2m)	
Relation with building					
Attached to building	Fixed to building	On roof	Not allowed		
		On wall or window	Allowed in principle <Exception> Direction not to the facing road is not allowed.	(*3)	
		Sticking out of the wall			
	Not fixed to building, such as banner				
Apart from building	Fixed on the ground or Not portable		Not allowed		
	Portable	No requirements			

(*1) "Reservation area" in case of raw house, and "Reservation area + Area of 4m behind reservation area" in case of independent building.

(*2) Out of building site, such as road area including pedestrian way.

(*3) Only one board sticking out from the external wall coming under conditions below is allowed.

- It invades the construction line by horizontally or less, and with height of or less, and
- Its lowest point is 3m or more higher than "road level of the facing road".

1.2. Requirement from the Viewpoints of Amount

Total amount of advertisement and sign surface are limited.

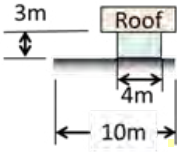
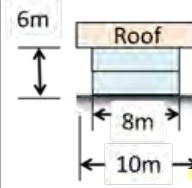
<Regulation>

Area volume of advertisement that can put up on the wall of a building is limited.

$T \leq La$ or Lb , and $T \leq Lc$
 T : Total amount of advertisement and sign surface.

<Actual Limitation>

The yellow box is actually used as limitation for each example (historic area).

Examples (Width of the site is 10m for every example)	Example 1	Example 2	Example 3
	Three kinds of limitation		
La(Facade) Facade area of the building in the site x 10%	4m x 3m x 10% =1.2 m ²	8m x 6m x 10% = 4.8 m ²	8m x 21m x 10% =16.8 m ²
Lb(For small case) Width of site(m) x 4m x 10%	10m x 4m x 10% =4 m ²	10m x 4m x 10% =4 m ²	10m x 4m x 10% =4 m ²
Lc(For large case) Width of site(m) x 10m x 10%	10m x 10m x 10% =10 m ²	10m x 10m x 10% =10 m ²	10m x 10m x 10% =10 m ²

(Source: Regulation Detailed LUP/ZC of Historic Area of City Wall in Vientiane Capital)

<Example of calculation>

Upper Limit (La)= **façade area x 10%**

$$= (12 \text{ m} \times 8 \text{ m}) \times 10 \% = 9.6 \text{ m}^2$$

Upper Limit (Lb)= **Width of site (m) x 4 m x 10%**

$$= 16 \text{ m} \times 4 \text{ m} \times 10 \% = 6.4 \text{ m}^2$$

Upper Limit (Lc)= **Width of site (m) x 10 m x 10%**

$$= 16 \text{ m} \times 10 \text{ m} \times 10 \% = 16 \text{ m}^2$$

Total Amount of Advertisement and Sign (T)

= **Total surface area of allowed "Advertisement and Sign"**

$$= (A) 3\text{m} \times 1\text{m} + (B) 2\text{m} \times 1\text{m} + (C) 1\text{m} \times 1\text{m}$$

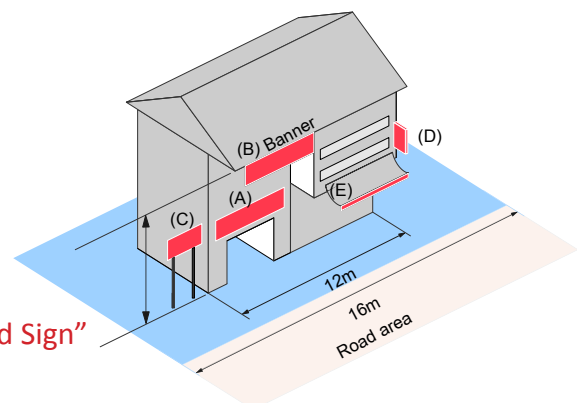
$$+ (D) 1\text{m} \times 1\text{m} \times 2 \text{ sides} + (E) 4\text{m} \times 0.2 \text{ m}$$

$$= 8.8 \text{ m}^2$$

(T) must be less than (La) or (Lb), and

(T) must be less than (Lc). Therefore, is acceptable

(portable ones are not counted)



1.3. Color

It is very important to take note the colors to be used in the advertisement board. The 'color circle' is shown in the figure on the right side. If No.4 (rO) and No.6 (yO) are used in one commercial board, most people will not understand the line of these two colors and such advertisement does not attract restaurants, services, and goods. Layout of colors is very important.

In some cases, practical color coordinate system (PCCS) is used. The PCCS is a color system made in 1964 by the Japan Color Research Institute, which was developed as a color system to put in practice its new color coordinate theory.

Complementary colors are pairs of colors which when combined, goes well with each other. Japanese famous convenience shops' advertisement uses red(R) and green(G). These two colors harmonize each other and makes advertisement very clear(Figure1).

Yellow(Y) and blue(B) are good as PCCS shows a good example of color matching in Figure2. Figure3 is also a good example of color matching.

The color of plate in Figure4 is 8.0R/5.0/20.0 and is vivid. In the center plate, the color is 8.0R/5.0/10.0. The right one's color is 9.0R/5.0/5.0. It is better to use the center and right plate's colors.

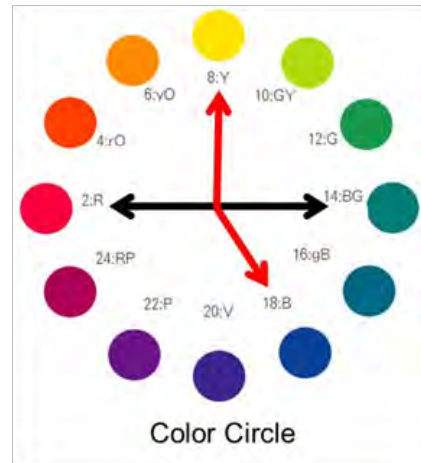


Figure1: Seven Eleven Sign



Figure2: Platz Clever Sign



Figure3: Color matching simple



Figure5: Color matching simple

1.4. Mascot

In the historic area, many advertisements with mascots are hanging and placed on the walls of restaurants and shops which is an effective method to attract consumers who see the advertisement.



Figure1



Figure2

In Japan, many private companies and local governments create mascots and are being used for sales promotions. If there are plans to open restaurants, shops, or offices, it is effective to create a mascot.



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Figure3

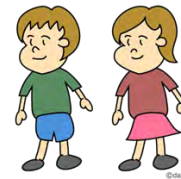


Figure4



Figure5

<<Good example>>

Very tasteful and unique advertisements are installed in the historic area.



Photo1

Photo1: Alphabet 'L' is in a form of an airplane and 'S' is in a form of Mekong River.



Photo2

Photo2: Unique carp mascot is in harmony with the character. It is a good color layout with green mascot and blue characters.



Photo3

Photo3: The trademark of Johnny Walker is installed on the wall of a restaurant. At night, this trademark itself lights up.



Photo4

Photo4: Woman and trade name are drawn by pen. Font design is good and mascot (woman) is in harmony with khaki color.

1.5. Font

Font is synonymous to 'typeface'. Characteristic font is effective in impressing consumers. It is effective to use a font in which tourists from abroad are familiar. Fonts on the right figure are the most frequently used fonts in the historic area.

These fonts give strong impression to the shop name and menu to tourists. Thin characters give right and bright image. Thick characters give warm feelings.

In the historic area, a lot of excellent advertisement and sign which use unique fonts can be seen.



<<Good example>>



Photo1

Photo1: This is a restaurant advertisement with font that is composed of several characters. This advertisement is formed by white plate and black font.



Photo2

Photo2: This is an excellent advertisement using Commercial Script BT Font. Wheat and bread mascots and characters are represented by a dark brown.



Photo3

Photo3: In order to convey the charm of grilled steak restaurants to consumers, the owner use plate of steel with orange color character.

2. Material

Wooden advertisement is simple and provides warm feelings. A lot of colors can be used for plastic plate advertisement and is

durable. Metal advertisement is profound, but metal is heavy and difficult to process.

<<Wooden>>

Wooden advertisement is suitable for wooden building. Creating materials of advertisement using similar colors is in harmony with wooden plate (for example: chroma of the same shade, but brightness is different).



Photo1



Photo2

<<Plastic>>

The advantage of plastic is that the advertisement board can be processed easily. It is possible to produce a mascot and sign and can be shaped freely, and it is possible to print photo on the plastic board. However, deterioration is fast and it is required to harmonize with the cityscape.

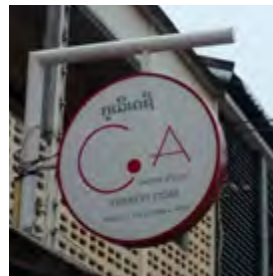


Photo3



Photo4

3. Light Up

Nighttime in the historic area is one of the attractions for tourists. Illumination of the sign with soft light and illumination of the sign itself are important cityscape element for the historic area. In historic area, modest and sober light up is recommended.



Photo5



Photo6



Photo7



Photo8