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THE KINGDOM OF THAILAND
MINISTRY OF INTERIOR
DEPARTMENT OF TOWN AND COUNTRY PLANNING

CITY PLANNING MANUAL

VOLUME VIII LAND READJUSTMENT

THE STUDY ON APPLIED TECHNOLOGY FOR MAKING CITY PLAN

JANUARY 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

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VOLUME VIII

LAND READJUSTMENT

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IMPLEMENTATION PROCEDURES FOR L/R IN JAPAN

Chapter 1

IMPLEMENTATION PROCEDURES FOR L/R IN JAPAN

All implementing procedure of L/R are dominated by the law of L/R which reflects the socio-economic and political peculiarity of Japan.

The basic features of L/R law in Japan, which regulate the technical and legal procedure of implementation of L/R projects, are enumerated below.

1. The law defines that L/R projects are of a public character by saying that the purpose is to promote public welfare through improving the living environment in the urban area.

2. The Japanese constitution prescribes that the public interest takes precedence over private rights. Accordingly L/R projects of public interest as defined above are endowed with legal enforcement over all landowners and others concerned as far as the disadvantages, if any, on the landowners caused by the implementation of project remain within socially acceptable standards. It also justifies government financial assistance to the project.

3. In line with the public definition or recognition of L/R, the law provides a legal basis for both organization of implementation and implementation of the project. (It is not necessary to rely on other laws)

4. The strict regulations on both the organization (establishment and management) and implementation (financial, technical rules and others) are set forth dictating due administrative procedures through which the approval of government and individual participants are sought, in order to secure the public interest, which is the main purpose of the project and also to defend individual rights and interests or maintain equality among the individual participants.

The prevailing perspective on Land Readjustment in Japan is illustrated in Fig. , centering on administrative procedure being followed by plan and design process (Technical Procedures). The main characteristics of Japanese L/R administrative procedure can be divided into 2 steps as follows:

1. Project and implementing organizations (in the case of an association) are to be legitimated, if and when "action plan and implementation ordinance" are approved by the government. These only state basic features of the project and do not include replotting in detail.

2. Replotting, which is the chief concern of individual landowners, is to be approved or agreed by government or association in the course of implementation of the project.

In response to the administrative procedure for implementation of teh project, a development plan, an action plan, replotting design and a replotting plan must be prepared.

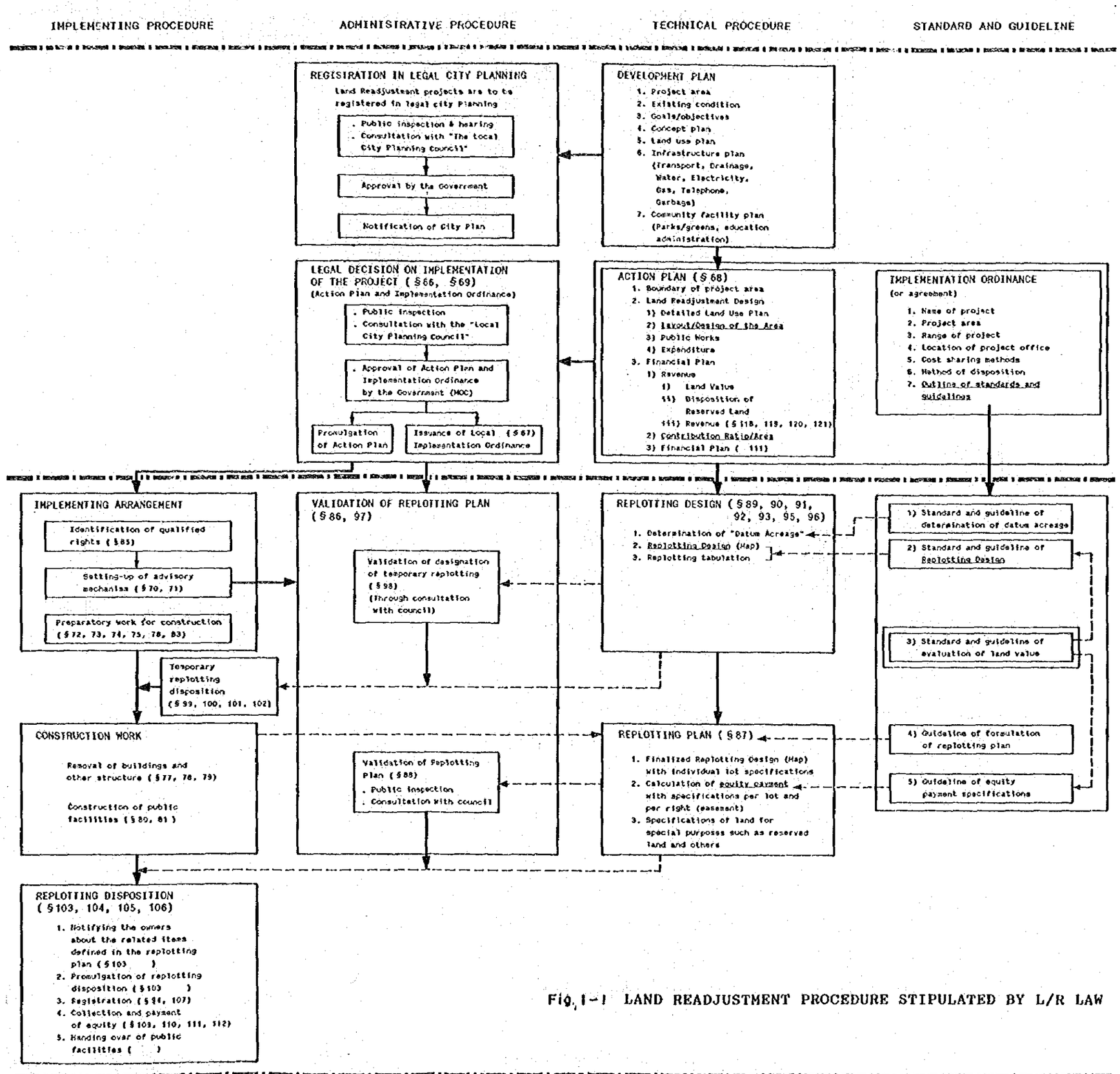


Fig. 1-1 LAND READJUSTMENT PROCEDURE STIPULATED BY L/R LAW

Chapter 2

Preparation of Development Plan

Chapter 2

Preparation of Development Plan

The technical report for the Laem Chabang specific plan which has already been formulated shall be reorganized into a development plan report with the contents as follows:

1. Project Area
2. Existing Condition
3. Goals/Objectives
4. Concept Plan
5. Land Use Plan
6. Infrastructure Plan
7. Community Facility Plan

Chapter 3
Preparation of Action Plan

Chapter 3
Preparation of Action Plan

The action plan firmly establishes the basic policy for the improvement of the project area, and for the implementation of the project.

The items which have been decided in the development plan are designed, calculated and laid out in concrete terms in ;the action plan.

3.1 Study Procedure

Total study procedure is shown in Figure.....

First, the boundary of the project area is delineated and followed by the an explanation of existing condition of the area and land readjustment design, which is to be used as the basis for replotting.

Second, based on the L/R design, a financial plan and program is established focusing on the calculation of contribution ratio and reserve land which are to serve as the major funding sources for the project.

The key consideration in preparing the action plan is to attain a reasonable "Contribution Ratio".

The ratio should be at a level acceptable (the lower, the better) to land owners who are to contribute land and at the same time sufficient (the higher, the better) to shoulder the project contributed by land owners.

3.2 Study Items and Contents

3.2.1 Boundary of Project Area

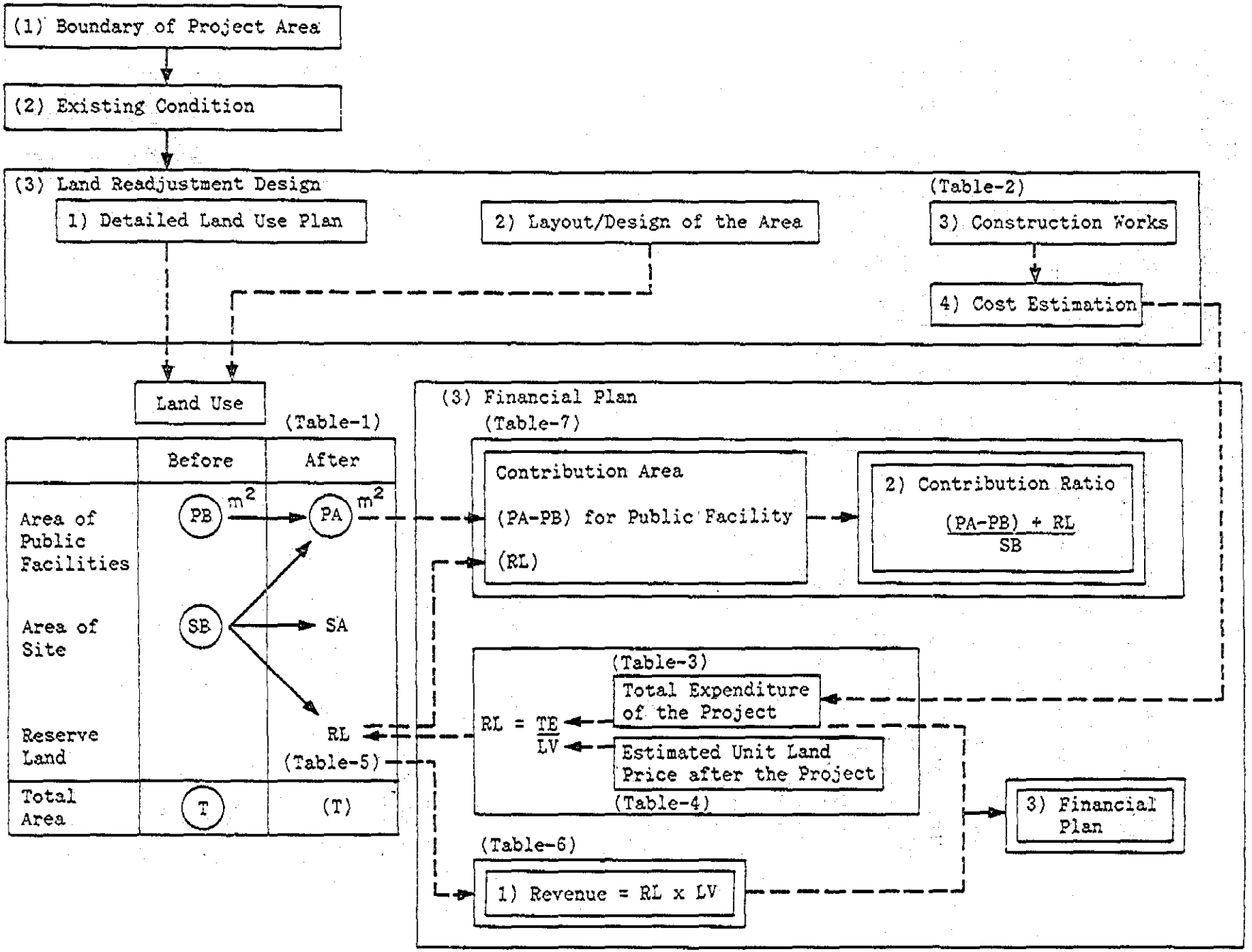
Project area of land readjustment shall be selected within the development planning area, taking into consideration such factors as follows:

1. Appropriate size of project area in correspondence with implementing capability.
2. Economic, social and physical unity.
3. Schedule of projects related to the area.

Boundary of project area is to be delineated along physical structures like roads, railway creeks etc., whose location is fixed throughout the implementation of the project. In the absence of such structures, the project area is to be bounded by a continuous line consisting of the boundaries of individual entitled lands which are to enjoy the benefit of the project.

(See Format Fig. 1)

ACTION PLAN


(1) Boundary of Project Area
(2) Existing Condition
(3) Land Readjustment Design
1) Detailed Land Use Plan
2) Layout/Design of the Area
(Table-2)
3) Construction Works
4) Cost Estimation
Land Use
(Table-1)
Before
After
Area of Public Facilities
PB m2
PA m2
Area of Site
SB
SA
Reserve Land
RL
(Table-5)
Total Area
T
(T)
(3) Financial Plan
(Table-7)
Contribution Area
(PA-PB) for Public Facility
(RL)
2) Contribution Ratio
(PA-PB) + RL / SB
(Table-3)
Total Expenditure of the Project
RL = TE / LV
Estimated Unit Land Price after the Project
(Table-4)
3) Financial Plan
(Table-6)
1) Revenue = RL x LV

3.2.2 Existing Conditions

An accurate picture of the existing conditions should be described for formulating the action plan as well as the replotting design, the building removal plan, and others.

Existing conditions should be depicted on a topographical map at a scale of 1 to 500, including such items as follows:

1. Public facilities such as roads, parks and waterworks.
2. Building and other structures, as well as other land use conditions.
3. Undulations within the area.
4. Shrines, temples, scenic and historic spots etc.
5. Boundary marks.

(See Format Fig. 2)

3.2.3 Land Readjustment Design

Detailed physical development plan which is to be implemented by means of land readjustment shall be formulated as follows:

Detailed Land Use Plan

Land Use Plan formulated previously in a development plan shall be prepared in detailed for the project area.

This is to be conducted in conjunction with layout/design of the area.

(See Format Fig. 3)

Layout/Design

Site plan for the area consists of layout of the hierachical network of roads ranging from arterial and feeder roads to access roads to each lot, other public facilities and block design for each land use.

Design policies have to be formulated for the site plan as follows:

1. Basic Policy for Laying Out Road Network

   Road network in the project area has to be planned to attain systematic and smooth traffic flow and safety.

2. Basic Policy for Block Design

   "Block" which is enclosed by the roads should be well designed so that lots being located in the block can be efficiently used in accordance with the land use plan and the block can accommodate the existing lots without any large differences in location of lots before and after the execution of the project, through techniques of replotting.

Standard size and scale of block should be determined supposing the size and scale of lots to be replotted in the block and optimum size and scale of lots for utilization of land in accordance with planned land use in the block.

(See Format Fig. 4)

Construction Works

Infrastructure and utility service facilities are planned and designed in accordance with the site plan formulated above. All necessary public works are listed.

In addition to the public works, plan and design for the implementation of L/R project such as land filling of the blocks, removal of buildings and other structures like electric poles, waterworks and so on should be prepared.

(See Format Fig. 5 and 6 and Tab. 2)

Cost Estimation

Cost of the project is estimated including cost of construction works which are implemented in the project, share defrayment of water works/sewerage, compensation for loss and damages, interest on loans, cost for study and design; office cost and others.

(See Format Tab. 3)

3.2.4 Financial Plan

1) *Revenue by Disposition of Reserved Land*

Land Value

Increase Ratio in total land value shall be estimated to indicate economic benefit of the project. Unit land prices before and after the project are estimated and multiplied by the area of the site before and after the project, respectively, to gain total land value.

(See Format Tab. 4)

Reserved Land

The area of reserved land should not exceed the maximum allowable area for reserved land; the total land value is equivalent to total land value increase by the project.

Necessary area of reserved land, which is to be sold for financing the cost of the project is set within the maximum allowable area.

(See Format Tab.5)

Government refunding which is equivalent to the total construction cost for infrastructures and facilities which the government entrusted the

implementing agency (e.g. L/R association) to construct.

(See Format Tab. 6)

Contribution Ratio/Area

Lands in the project area are contributed to create sites for public facilities and reserve land.

Contribution area for public facilities is equal to the increased area of public facility before and after the project. (= area of public facilities after the project - area of those before the project)

Total contribution area is equal to the summing up of the increased area of public facilities and reserved land calculated above.

The contribution ratio can be estimated by dividing the total contribution area by the site area before the project.

(See Format Tab. 7)

Financial Plan

Financial Plan is formulated by tabulating cash flow of revenue and expenditure by fiscal year.

(See Format Tab. 8)

APPENDIX 1

FORMAT FOR PREPARATION OF ACTION PLAN

Fig. 1 Map of Boundary of Project Area

Specify the project area with the boundary delineated on a map at a scale of 1 to 1000.

Fig. 2 Maps of Existing Conditions

Draw the existing condition maps at a scale of 1 to 500.

Fig. 3 Detailed Land Use Plan

Indicate the land use of each block enclosed by the road on a map at a scale of 1 to 1000.

(It is convenient to use the design map prepared at the next step as the base map for the land use plan)

Tab 1 Land Use before and after the Project Design Map

The areas of land use are measured and tabulated as in Table 1.

Fig. 4 Design Map

Design the site for public facilities - roads, parks, schools, administrative and other institutional facilities on a map at a scale of 1 to 1000.

Fig. 5 Public Facility Plan

Design public facilities such as roads, parks, drainage facilities, waterworks and others on maps at appropriate scales.

Tab 2 List of Public Works

Public works are listed in the Table 2.

Fig. 6 Map showing plans of buildings removed and gas, telephone poles, water supply and sewerage disposal facilities relocated.

Tab 3 List of Expenditure

Costs of all the construction works are estimated and tabulated in Table 3.

Tab 4 Land Value

Increase ratio in total land value can be estimated through completing Table 4.

Tab 5 Reserved Land

Necessary areas for reserved land are set within maximum allowable area in Table 5.

Tab 6 Revenue

All the revenues are listed in Table 6.

Tab 7 Contribution Area/Ratio

Contribution area/ratio can be calculated through completing Table 7.

Tab 8 Cash Flow

Cash flow is tabulated in Table 8.

Table 1 LAND USE BEFORE AND AFTER THE PROJECT

		Before the Project (m^2)	Ratio (%)	After the Project (m^2)	Ratio (%)
Area of Public Facilities	Road				
	Parks				
	Klong				
	Others				
	Total				
Area of Sites	Residence				
	Commerce				
	Industry				
	Agriculture				
	Others				
	Total of Private Sites				
	Governmental Sites				
	Total				
Gap between Registered Area and Surveyed Area					
Reserved Land					
Grand Total					

Table 2 PUBLIC WORKS

		Width (m)	Length (m)	Area (m^2)		
Road	Artery 1					
	2					
	3					
	Feeder 1					
	2					
	3					
Klong/Canal						
Parks and Green Areas						
Others						
Total						

Table 3 EXPENDITURE

Items			Unit	Quantity	Amount ฿	Remarks
Construction Cost						
	Roads	Artery				
		Feeder				
		Total				
	Klong/Canal					
	Parks and Green Areas					
	Others					
Cost for Removal						
	Buildings					
	Others (electric poles waterworks and so on)					
Cost for Land Filling						
Other Construction Cost						
Cost for Study and Design						
Share Defrayment of Waterworks/Sewerage						
Compensation for loss and damages						
Interest on Loans						
Office Cost						
Total						

Table 4 LAND VALUE

Area of sites before the project	m^2
Adjusted area of sites before the project	m^2
Unit land price before the project	฿ / m^2
Total land value before the project	฿
Area of sites after the project (including reserved land)	m^2
Estimated unit land price after the project	฿ / m^2
Total land value after the project	฿
Increase ratio in total land value	%

Table 5 RESERVED LAND

Total land value of the sites before the project	฿
Total land value of the sites after the project	฿
Total increase in land value between before and after the project	฿
Estimated selling unit price of land after the project	฿/m^2
Maximum allowable area for reserved land	m^2
Necessary area for reserved land	m^2
Percentage of necessary area to maximum allowable land for reserved land	

Table 6 REVENUE

Resource of Revenues	Amount (1,000 ฿)	Ratio (%)	Remarks
Disposition of Reserved Land			
Others			
Total			

Table 7 PRELIMINARY CALCULATION OF CONTRIBUTION RATIO

ITEMS		
Accumulated registered area of the sites before the project		m^2
The area adjusted with gaps between registered and surveyed area		m^2
The area of sites after the project	Including reserved land	m^2
	Excluding reserved land	m^2
Contributed area	For public facilities	m^2
	For public facilities and reserved land	m^2
Contribution ratio	For public facilities	%
	For public facilities and reserved land	%

Table 8 CASH FLOW

Items \ Fiscal Year						Total
Expenditure . Construction . Compensation . Interest . Others Total						
Revenue . Disposition of Reserve Land . Government Refunding . Subsidy and Grant . Others Total						
Balance						
Borrowing						

Chapter 4

LAND EVALUATION

Chapter 4

LAND EVALUATION

4.1 Concept of land evaluation

4.1.1 Land Evaluation

Land evaluation is a value judgment on how land is economically utilized. It is expressed in calculated value which is an aggregate of values indicated in numerical value table for tax collection or land evaluation standard for land readjustment project.

4.1.2 Pattern of Land Evaluation

Methods of land evaluation have been established in the form of standards and guidelines. They vary depending on the purpose of evaluation but can be roughly classified as follows :-

- Standards for real estate appraisal
  ----- standard for evaluation being used by real estate appraiser.

- Standards for evaluation for real property tax
  ----- standard for evaluation being used for the basis of real property taxation.

- Standards and guidelines for compensation for losses incurred by land acquisition by government
  ----- standard for evaluation being used for land acquisition in government projects.

- Standard for calculation of land utilization increase ratio
  ----- In addition to official standards established by the state there are standards established by the implementing agency of each land readjustment project.

4.2 Land evaluation for land readjustment projects

Land evaluation for land readjustment projects is not necessary for land purchasing but for measuring how much the land value will change after the development, that is the degree of site utilization increase.

A very extensive amount of land and rights such as leasehold must be consistently and equitably evaluated in keeping the balance with one lot to another in a relatively short period of time.

4.2.1 Purpose

Necessity and purposes of land evaluation are defined in the course of implementation of land readjustment project as follows :-

Calculation of re-plot area

As stipulated in the land readjustment law, re-plot should correspond to the original lot in terms of location, area, soil condition, water utilization, land use and environment of lot.

The more the area of land for public facilities increases through the land readjustment project, the more the area of private land decreases.

The question of how to rationally share the decreased land among the existing lots before the development should be answered by calculating the re-plotting area.

It is generally said that lots are re-plotted with the right being equivalent to that before the development in terms of price.

Accordingly, estimation of price of right on land hold and leasehold is imperative for re-plotting design.

Calculation of equity payment

Since lots are re-plotted within certain limitations (i.e. into the block designed in the action plan), disparity in value between the original lot and the re-plot, discrepancy between the re-plot area calculated in the re-plotting design and the area of re-plot which has actually been allotted in the block, and imbalance among re-plots may occur.

Such disparity, discrepancy and imbalance as stated above should be corrected by equity payment, for which land evaluation is necessary.

Establishment of reserved land (or compensation for decreased value)

The reserved land shall be set in such a manner that its total land value is within the range of value which is equivalent to the increment of the total value of lands through the project. In order to estimate the increment in monetary terms, evaluation of land before and after the development must be conducted.

4.2.2 Conditions

Main conditions of land evaluation for land readjustment are enumerated as follows :-

1. A very extensive amount of land must be evaluated in a relatively short period of time.

2. Evaluations of individual parcels covering an extensive area must be balanced with each other.

3. Land evaluation should not vary with different valuators.

4. Although the project extends over a relatively long period of time from its inception to its completion, the land evaluation method must be capable of evaluating the area both before and after the development with the same standard.

5. It should be able to convince a large number of land owners.

Base year for evaluation

With the project extending over a long period from the start to the end of development, a base year must be fixed for land evaluation.

In principle, the base year for evaluation of land before the development is set at the year when the official announcement of the action plan is made and the base year for evaluation of land after the development is set at the time when the construction works are completed.

However, in practical terms, land evaluations are usually conducted when judgments are made on the necessity of compensation for decreased value and establishment of reserved land in the course of preparation of action plan and when re-plotting design and calculation of equity payment are carried out in the formulation of the re-plotting plan.

Year of price

Land price the time when the construction is nearly completed shall be used for the calculation of equity payment so that factors not being attributed to the land readjustment project cannot influence the land evaluation.

Leasehold and its price

The price of leasehold and the price of ownership which is subject to lease land are closely interrelated to each other.

Practices and maturity of business transactions of leasehold vary depending on cities and regions.

Price of leasehold is generally recognized on the land to which leasehold is established. It is reasonable to set the share of leasehold in value at some percentage depending on land use of the district.

In the land readjustment project, share of leasehold shall be carefully determined in consideration of the relationship of lot before and after the development.

4.2.3 Methods of land evaluation

Methods of land evaluation include far-sighted view evaluation method, contour price method, cost value method, market price comparison method, and profit analysis method. However "The Street Value Evaluation Method" is generally chosen as it complies with all the conditions enumerated in Chapter 2-(2).

The street value evaluation method

In this method a lot with a standard frontage, depth and shape is hypothesized, and the hypothetical land value per unit area (m) which is called "street value" is calculated on the basis of the street the lot faces.

This hypothetical land value is modified by such individual characteristics as actual lot shape and condition, and the relationship with the street it faces in order to get the value of individual lots.

Zone price

In the project site where the street value evaluation method seems to be unsuitable due to the existing land use such as extensive land coverage by farm land, forest or field etc., land can be evaluated by using "Zone price".

The project site is divided into zones with approximately the same land price.

The street value evaluation method can be correspondingly applied to the evaluation of land value of zones.

4.3 Necessary data for land evaluation

Surveys must be conducted to obtain necessary data and information on existing condition of lands which are used and going to be used for public facilities and on the existing land use condition of lots.

4.3.1 Surveys on land evaluation

Surveys on land evaluation must be carried out with a view to prepare the base data for re-plotting design, calculation of equity payment, design of reserve land and compensation for decreased land and so on.

a. Survey on public service facilities before the development.

- Road, canal, river (width, structure, system, consistency, land scope, curve, gradient, and so on).
- Existing condition of transport facilities such as railway, station, bus terminal and so on. Distances between the facilities and each street.
- School, hospital, transmission station, incinerator and cultural/social welfare facilities.
- Water works, sewerage, drainage, gas-pipe, electric facilities and other urban facilities.

b. Survey on city planning currently in force and on environment before the development.

- Locational relationship between the center of town and the project site or neighboring area.
- City plan, regulation and limitations.
- Scenery, landscape, noise and other public nuisance.

c. Topography, geology, ground condition, sunlight, wind, humidity and others which are supposed to influence land value.

d. Survey on plan and programs of facilities and structures which are to be constructed in relation to the land readjustment project.

- Street construction (the right of way, structure, system and network, landscape, curves, gradient and level of improvement of streets).
- Plaza, park, green area, reservoir, creeks, river (construction work and distance to each street).
- Plan of new construction and renovation of streets.
- Plan of public service facilities.

e. Survey on block plan/design

. Block plan/design with shape and area

. Linkage between composition of block and urban facilities.

. Other factors which are supposed to influence land value after the development.

f. Survey on rights and interests entailed on land

It is necessary to survey all the rights and interests that exist in the area, including the title of real estate, ownership, lease holding etc. Data on these are obtained from land registers and cadastral maps at the register office. Information on location; land category, area, history, registration date, ground and address of the land owner and the lease holder etc. are obtained from the land register, and information on street unit boundary, street name, lot boundary and lot number are obtained from the cadastral maps. Since some of the lands owned by the state and others, may not be registered, it is necessary to study the ledgers of the authorities concerned and survey maps to obtain all the necessary information.

. Land registration ledger, cadastral map and application of rights.

. Datum area and indication of lots before the development.

. Coordination on nullification and reverion of lands used for public facilities.

. Pre-empted lands for public facilities and lands for compensation for decreased land.

g. Assessment for taxation and example of transaction

. Survey on standard tax of real property.

. Survey on standard for assessment of property for inheritance tax.

. Survey on example of real estate transaction and distribution of land price.

. Survey on real estate appraisal.

4.3.2 Preparation of data for evaluation

Compilation and examination of necessary data are very important for land evaluation. Form, content and date are carefully checked for effective utilization of data.

Data for calculation of street value

- Action plan and related map
- Existing condition map (survey map, 1/1,000)
- City plan
- Street map before the development
- Street plan after the development
- Land map before the development (1/500)
- Record book and map for filling in elements constituting street value (before and after)
- Calculation table of street value (before and after)
- Base map for filling in coefficient and indices of street value.

Data for calculation of lot value

- Land registration record and leasehold record
- Ledger of land directory
- Record of datum area of lot
- Land map before the development (1/500)
- Calculation table of lot value
- Map for calculation of lot value

Data related to tax assessment (for reference only)

- Assessment map for real property tax, unit price (per m), map of street value index.

- Map of standard price for inheritance tax, map of street value index.

- List of land price all over the state and commodity price index.

Example of transaction of real property

- Record and map of transaction
- Map of land price in public announcement
- Record and map of real estate appraisal

4.3.3 Formation of standard for land evaluation

Determination of basic policy

"Street value evaluation method" has broadly been adopted for land readjustment projects.

Content of the standard

Items which must be stipulated in the standard in response to the actual condition of each land readjustment project are enumerated as follows.

- Purpose for establishing the standard for land evaluation
- Application area of the standard
- Definition of terms
- Method of evaluation

- Classification of land uses
- Streets whose street value should be calculated
- Method of titling street value and indication of street value
- Calculation of street value
- Evaluation of land value of the original lot and re-plot
- Definition of lot and calculation of lot value index
- Method of lot land value evaluation
- Modification of index
- Evaluation of index and others
- Evaluation of large scale lot
- Evaluation of blocks
- Partition of lot and others
- Measures for the cases where items stipulated in this standard are not applicable

Draft of standards for land evaluation is illustrated in the appendix

4.4 Calculation of street value

4.4.1 Street value and street value index

Utility value of each lot varies depending on the locational conditions which determine values inherent to the place the lot belongs to.

Land value evaluation may be standardized by introducing "Uniform lot value area", that is, area where lots are of uniform value.

Uniform lot value area may be identified through judgment on what are the locational conditions determining the values inherent to the places and demarcating the area in the same locational conditions.

Street value is the standard price of lot in the uniform lot value area.

The street value is not expressed in monetary values but by the "index", a relative value which is referred to as "street value index".

In spite of the possibility that the economic value of a lot may change over a long project implementation period, in the land readjustment project evaluations of land values at different times (before and after the development) must be made at one time (that is, at the onset of the project). Land value expressed in index numbers have such advantages as substantiality of real value, flexibility to on-going economic changes, and easier comparison of the increase ratio before and after the project.

The index number is multiplied by unit price (₱per m) to express the value in monetary terms. With the highest street value calculated in the project site being equivalent to an index number of 1,000 units, street value index number of other streets can be proportionally calculated.

4.4.2 Method of setting up street value

Streets whose street value should be calculated and set up

- Streets owned by the state or local government
- Private streets, the lands of which are not re-plotted in the re-plotting plan

- Path, canal, alley, whose calculation of street values lead to proper site development
- Street value should be set up on each side of the street when land conditions on each side are greatly different

Section for street value

- Street value is set up on every section of streets enclosing blocks
- At section of street shall be subdivided if the land values along that section differ very much
- One single street value can be set up over 2 or more blocks with no difference in land value

4.4.3 Calculation of street value

Street value represents utility value of lots along the street evaluated on general conditions of block (i.e. specific conditions which differ depending on each lot are excluded). Accordingly, characteristics of lot or block (for instance size, gradient, soil ground, etc) shall not be taken into account for evaluating street value. Based on the result of examination of the elements composing the street value, street value can be calculated as follows :-

Street value = Street coefficient + accessibility coefficient + land coefficient

Street coefficient : To represent utility value/effect accruing only from the street which the lot faces.

Accessibility coefficient : To represent benefit or loss which is determined according to the relative access distance from the lot to facilities such as transport, amusement and public services.

Land coefficient : To represent the value being determined by the land characteristics such as effectiveness of land use, cultural value, safety etc.

4.5 Lot evaluation

Lot value is established through modification of the street value calculated as base value, in response to the individual nature of each lot.

- Unit index (index number per m) and total index shall be calculated and established on each lot in the planning area before and after the development (original lot and re-plot)

- In special cases, with a lot being sub-divided or some lots being aggregated into a single lot, unit land value index can be calculated and established

- Index number for one entitled right shall be the sum of index numbers of lots consisting of the one entitled right

- Street value is multiplied by depth successive decrease ratio to calculate and establish the unit land value index and total land value index of "ordinary lot"

- As for corner lot, first, the total index of the lot is calculated as that of ordinary lot is as above. Second, index of additional vantage accruing from side street is added to the total index of lot calculated as ordinary lot. The total index is divided by the area to get unit land value index of corner lot

- When lot is sandwiched between two different streets, an aggregate of both total index being calculated as a ordinary lot and index of additional vantage accruing from back street is divided by the area of lot in order to get unit land value index of the lot

- To gain unit land value index of "island lot" street value index of street, which the lot mainly gives access to, is multiplied by depth successive decrease ratio at the depth which is equivalent to the distance from the street to centroid of the lot

- Major coefficients which are used for modification in response to the condition of lot are enumerated as follows :-

  Depth successive decrease ratio
  Triangle successive decrease ratio
  Irregular angle successive decrease ratio
  Irregular shape successive decrease ratio
  Island successive decrease ratio
  Cliff successive decrease ratio
  Private street successive decrease ratio

4.6 Evaluation of block

4.6.1 The purposes

The purposes of evaluation of block are to get a balanced value index and a contribution ratio of lot over the blocks and to obtain average unit land value of block which is to be used for calculating the area of re-plot in the block.

4.6.2 Method of block evaluation

Major methods of block evaluation among many methods which can be applied in response to different conditions of block are as follow :-

1 The block is to be divided into two parts with corner lots (at the rate of frontage length 2 to depth 3) by center line running between front and back streets.
Average indices of each part are calculated with additional vantage of the corner lots.

2 The block is to be divided into 2 (two) parts by the even points in land value from both front street and back street.

The depth decreases are calculated at the depth which is equivalent to the distance between the even point and both of front street and back street respectively.

3 Average unit land value of block is calculated using average street value of all the streets enclosing the block.

4 Boundary of back yard and corner lots of block are supposedly designed on the basis of presumed re-plotting for the original lots. On this ground indices are calculated.

4.6.3 Output of block evaluation

The area, total land value index and unit land value index (per m)

4.7 Roles of evaluator

When values of land and rights which exist on land are determined for reserved land and equity payment in the re-plotting design, and for compensation for decreased value, the implementing body must consult evaluators, and the following data and materials should be prepared as follow :-

- Standard for land evaluation (draft)
- Street value (map) before the development
- Street value (map) after the development
- Lot evaluation before the development (area, unit and total land value)
- Lot evaluation after the development (area, unit and total land value)
- Price of unit value
- Percentage of share of rights

APPENDIX 2

STANDARDS FOR LAND EVALUATION

Purpose

1. The purpose of these standard is to establish a formula of land evaluation for land readjustment projects being implemented by ---- under the land readjustment law, which leads to fair and balanced evaluation.

Application

2. These standards are to apply to land evaluation required at various stages of implementation of land readjustment projects as follows:-

Formulation of action plan: Estimated "unit land price" before and after the development is a basis for setting up policies on reserved land and advanced land purchase for public land.

Re-plotting Design: Estimated "land price of lot before the development and its increasing ratio" are determinants of entitled value of land after the development.

Re-plotting disposition: Final setting of land price of lot before the development, entitled value of land and re-plotted land value after the development is necessary for determining equity payment and compensation for decreased value.

Definition of terms

3. In these standards, terms are defined as follows :-

Lot: Part of entitled lot, to which legal rights of use and benefit, such as leasehold, tenant right and others, are attached.

Frontage: side of lot adjacent to street.

Standard lot: Rectangle lot adjacent at right angles to street which is supposed to have the highest land value in general usage of lot.

Street value: utility value of standard lot which is hypothesized to have a standard frontage, depth and shape, which is expressed in value per m .

Street order: order of street in the magnitude of street value. The larger the street value, the higher rank the street is in.

Front street: street with higher street order, among streets which lot faces.

Side street: street which flank of corner lot faces.

Back street: street which back yard of lot adjacent to 3 or 4 different street faces.

Partition line: Boundary line dividing land into lots.

Depth successive decrease ratio: The ratio of value which express the change in value according to the depth of lot.

Large scale lot: lot which is too large to be accommodated in ordinary block, which is or is going to be used for one united land use.

Method of evaluation of lot

4. Land evaluation must in principle follows the standards stipulated in the following articles, 6 to 23.

Classification of land use

5. Land use shall be classified into (A) advanced commercial area, (B) commercial area, (C) residential area, (D) industrial area. These classifications are used as land use conditions for street value and lot value evaluation.

Streets whose street value should be calculated

6. Street value of all the streets with a width of more than 4 m, which can act as road way and pedestrian way should be evaluated.

   Additionally, streets which are supposed to have functions equivalent to those of street identified above should be included.

Pedestrian Path

7. Street value of pedestrian paths which are planned and constructed in urban development project on view that pedestrian paths are connected with the streets which can work as road way also should be evaluated.

Method of titling street value

8. Street value should be titled on each block section of street.

   2. In spite of this rule, street value can be titled on sections being subdivided due to different land uses along the section and on both sides of sections due to the different land use between the right and left side of the street.

Calculation of street value

9. Street values should be calculated following the formula prescribed in the appendix-1

Indication of street value

10. Street value is indicated in street value index which is proportionally calculated with the highest street value in the project site being equivalent to an index of 1,000 units.

Lot index

11. Unit value index (per m) and total value index of both lots before the development and re-plot should be calculated.

    2. In a case of special necessity, several lots adjacent to one another which are aggregated can be regarded as one lot, whose total value index is calculated. In correspondence with the total value index, unit value index and total value index of each compoment lot can be calculated.

    3. Value index of one registered right of site consisting of some pieces of lots can be calculated by aggregating total value indices of the pieces of lots.

Calculation of lot value index

12. Unit index (per m) and total index should be calculated as indicated articles 13 to 17 with the lots being classified as follows:

    (1) Ordinary lot ---- lots, one of the sides of which is adjacent to a street.

    (2) Corner lot ---- lot being located in the corner of 2 crossing streets, which the lot faces.

    (3) Lot being sandwiched between two different streets ---- Lot being sandwiched between two different streets, both of which the lot is adjacent to.

    (4) Lot being adjacent to 3 (three) or 4 (four) different streets ---- Lot being adjacent to 3 or 4 different streets, all which the lot is adjacent to.

    (5) Island lot ---- lot being adjacent to no street.

Calculation for ordinary lot

13. Unit land value index of individual lot is calculated in the manner that the street value index of the street the lot faces is multiplied by depth successive decrease ratio, and which is corrected in response to the shape and condition of the lot as stipulated in article 18.

    Total land value index of individual lot is calculated by multiplying the unit land value index (per m) by the area of lot (m).

Unit land value index = Street value index
x depth successive decrease ratio
x correction by shape and condition of lot

2. When calculation must be made for more than 2 pieces which one lot is sub-divided into, the aggregate of the individual index of each piece which is separately calculated in the same way as above shall be divided by lot area to obtain the unit land value index of the lot, and total land value index is calculated by multiplying the unit land value index by the total area of lot.

Calculation for corner lot

14. To gain unit land value index of corner lot an aggregate of both total land value index by front street, which is calculated as an ordinary lot (neglecting the side street of corner lots), and additional vantage index of corner lot shall be divided by the total area of the lot.

The unit land value index multiplied by the area of lot is total land value index.

Unit land value index = (unit land value index of ordinary lot + additional vantage index of corner lot) / lot area

2. Additional vantage index is calculated as follows:-

Additional vantage index = street value index of side street
x side frontage length of lot
x additional vantage ratio

Table -2 -1 generally applies to additional vantage ratio.

However in the case that the frontage length of lot is no more than 15.0 m, the values and figures listed in the table - 2 -1 must be multiplied by 1/15 x frontage length of lot to get the additional vantage ratio.

3. In the case where the value of $\left(\frac{\text{Street value of side street}}{\text{Street value of front street}}\right)$ exceeds 0.8 and the length of side street frontage is longer than that of front street frontage of lot, calculations of lot value index must be made in the same way as stipulated above, in 2 cases with each of 2 streets the lot faces being front street respectively.

The larger one is defined as the land value index of the corner lot.

Calculation for lot being sandwiched by two different streets

15. To gain unit land value index of sandwiched lot, an aggregate of both total land value index of front street and additional vantage index of back street shall be divided by the lot area. The unit land value index multiplied by the total area is total land value index of lot.

2. Additional vantage index by back street is calculated as follows:-

Additional vantage index by back street =
Street value index of back street
x depth successive decrease ratio
x additional vantage ratio
x length of back yard frontage
x depth $\times \left(\frac{\text{street value index of back street}}{\text{street value index of front street}}\right)^2$

Table 2-2 generally applies to additional vantage ratio of back street. However, in the case where the depth of lot is no more than 30m, the values and index being listed in the Table 2-2 must be multiplied by 1/30 x depth of lot (m) to get additional vantage index by back street.

Calculation for lot being adjacent to 3 or 4 different streets

16. To gain unit land value index of lot being adjacent to 3 or 4 different streets, an aggregate of unit land value index by front street, additional vantage index by side street (article 14.2) and additional vantage index by back street (article 15.2) shall be divided by the lot area. Article 13.2 can be applied correspondingly to calculation of total land value index of lot.

2. Article 14.2 can be applied correspondingly.

Calculation for island lot

17. To gain unit land value index of island lot, street value index of street which the lot mainly gives access to shall be multiplied by depth successive decrease ratio at the depth which is equivalent to the distance between the street and centroid of the lot, which is corrected inthe way that article 18 prescribes.

Correction of index

18. Depth successive decrease ratio shown in Table 2-3 applies to correction of index depending on the depth of lot.

2. Land value index of lot or its part which comes under such categories as prescribed below should be corrected the way relevant item dictates as follows :-

(1) Lot whose frontage length is less than 4 m. To be multiplied by Frontage successive decrease ratio shown in Table 2-4.

(2) Lot whose depth is more than 3 times of frontage length.

To be multiplied by huge depth decrease ratio shown in Table 2-5.

(3) Triangle lot in isolation.

To be multiplied by triangle decrease ratio which is set at 0.9.

(4) Triangle lot being a part of lot.

To be multiplied by triangle decrease ratio which is set at 0.95.

(5) Lot at irregular angle to street.

(Lot being at less than 85 angle to street with 2 side lines of lot being roughly in parallel to each other).

To be multiplied by irregular angles decrease ratio shown in Table 2-6.

(6) Lot with irregular shape.

To be multiplied by irregular shape decrease ratio ranging from 1.00 to 0.90.

(7) Cul-de-sac (blind alley) lot.

To be multiplied by Cul-de-sac decrease ratio (0.95).

(8) Island lot.

To be multiplied by island decrease ratio (0.90).

(9) Inclining (cliff) lot.

To be multiplied by cliff decrease ratio (0.5 - 0.3).

(10) Lot with different ground levels.

(Lot with different ground levels, which needs cutting and filling and lot with difference in ground level between lot and front street).

To be multiplied by decrease ratio shown in Table 2-7 depending on the degree of difference. The decrease ratio should be selected within the range of expenses incurred for the cutting and filling.

Evaluation of private street and others

19. Unit land value index of both streets whose street values are calculated and titled, and lots or their parts being used for

private streets should be calculated in compliance with such stipulations as follows, instead of those in article 12.

(1) Lot or its part which is exempted from property tax.

Street value calculated is multiplied by decrease ratio of less than 0.1.

(2) Lot or its part which is not exempted from property tax.

Street value calculated is multiplied by decrease ratio of 0.3.

Calculation of lot including private streets and others

20. Lot, a part of which is used for street with street value or private street, should be divided into the proper part and the other, whose unit land value indices are calculated in conformity with stipulations of article 19 and 12 respectively. Unit land value index and total land value index of the whole lot are calculated in the same way as stipulated in article 13-2.

Evaluation of large scale lot

21. Land value index of large scale lot should be determined taking into consideration purpose of development, size and shape of lot and the results of comparative studies on distribution patterns of land prices being formed in normal land use conditions, profitability and others.

Evaluation of block

22. Land value index of block as a unit of calculation is a basis for calculating lot utility increase ratio.

With the block being divided into more than 2 parts in consideration of re-plotting in the block, the method of evaluation of lot stipulated in article 4 can apply to the evaluation of block, which is encompassed by streets titled with street value indices.

Partition of lot and others

23. When lots are partitioned or merged after the designation of temporary re-plotting, the total indices of lots are calculated as follows.

(1) The total land value of the lot is proportionally distributed to pieces which the lot is divided into so that the total land value of the lot before the partition is equal to an aggregate of total land values of pieces of lot after the partition.

(2) An aggregate of total land values of lots before the merger is equal to the total land value of the lot after the merger.

Evaluated price of lot

24. Evaluated price of lot is to be equal to the total land value index multiplied by unit price of index.

2. Evaluated price of each entitled land should be a summation of evaluated prices of lots in the entitled land.

Unit price of index

25. Unit price of index should be determined on the basis of average and reasonable land price on completion of construction work.

Price of right

26. To calculate the price of rights vested in the lots before the development and re-plot total land value index of lots with the rights shall be multiplied by standard share of rights shown in Table 2-8 and unit price of index.

Entrust

27. is entrusted to determine what is recognized to be necessary for land evaluation in addition to the stipulations in this standard.

Document of land evaluation

28. In order to make land evaluation clear, such document as follows should be prepared:-

(1) Report on calculation of street value.

(2) Map of street value index before and after the development (scale 1/1,000 - 1/500).

(3) Map of unit land value index of lots before and after the development (scale 1/1,000 - 1/500).

(4) Report on calculation of unit land value index (per m^2).

(5) Report on land evaluation.

FORMULA-1 Calculation of Street Value

The street value is equal to an aggregate of the following 3 (three) elements.

Road value = street coefficient + accessibility coefficient + land coefficient

1. Street Coefficient

The street coefficient varies according to the street network, continuity, width, construction, grading, curve, and scenery along the street, and is described bu the following expression:

Street coefficient = $t.F(w) + \Sigma X$

When t .... Coefficient of street characteristics in terms of street network and continuity, which is given in Table 1-1.

F(w) .... Modifing the t value in accordance with width (w) of street.

Formulas of F(w) are established as follows, and the most appropriate one shall be selected.

a
$$F(W) = \frac{W-2}{W} \quad (W \geqq 4m)$$
$$F(W) = \frac{W}{8} \quad (W < 4m)$$

b
$$F(W) = \frac{W-3}{W} \quad (W \geqq 6m)$$
$$F(W) = \frac{W}{12} \quad (W < 6m)$$

c
$$F(W) = \frac{W-1.5}{W} \quad (W \geqq 3m)$$
$$F(W) = \frac{W}{6} \quad (W < 3m)$$
} New Development Area

d
$$F(W) = \frac{W}{W+3}$$ ..... General

X .... Coefficient describing characteristics of street construction: in terms of factors such as: paved or unpaved; existence of separate sidewalk; grading; curves and scenery along the street, which is given in Table 1-2.

2. Accessibility Coefficient

This coefficient describes the relative distance between the site and the public facilities, and may vary according to the kind and the nature of such influencing facilities.

It is described as follows:

$$\text{Accessibility coefficient} = \Sigma M \cdot F(s)$$

M .... Degree of influence of the said facility

F(s) .... Reduce the M value in accordance with the distance(s) between the said facility and the evaluation point of the street value.

F(s) is expressed as follows.

$$F(s) = \left(\frac{S-s}{S-R}\right)^n \quad (s \geqq R)$$

$$F(s) = 1 \quad (s < R)$$

S : Degree of range of effects, which varies depending on the nature of the said facility. S values are given in the Table 1-3.

R : Fixed distance, within the range of which M value keeps constant, which is given in Table 1-3.

n : Successive decrease rate of effect of the said facility, which is given in Table 1-3.

s : Distance between the said facility and the evaluation point of the street value.

3. Land Coefficient

This coefficient is used to evaluate the kind of purposes for the site such as residential, commercial and others, degree of spread of utility and disposal facilities, and availability of the right to enjoy sunlight. The following expression describes the land coefficient.

Land coefficient = $U.F\ (P.Q) + \Sigma Y$

U.F(P.Q) .... Representing utilization value and effect of lot which are to be created by land use and public utility improvement.

U : Degree of utilization value of lot as urban land, being influenced by land use, building density, commercial potential, maturality of urban development and so on, which is given in Table 1-4.

F(P.Q) : Modifying U value depending on effectiveness of lot in land use, disaster prevention and safety resulting from infrastructure improvement. It is expressed as follows.

$$F(P\cdot Q) = 1+\sqrt{\left(\frac{P}{Po}\right)\times\left(\frac{Q}{Qo}\right)}$$

Po : Standard ratio of public open land which is given in Table 1-5.

P : Ratio of public open land in the district where evaluation point is located, (%)

Qo : Standard street density (length of street in the district/district area) which is given in Table 1-5.

Q : Street density in the district where evaluation point is located.

Y .... Representing value and effect being added to the lot by physical conditions, such as availability of waterworks and disposal facilities, accessibility to waterworks and so on, which is given in Table 1-6.

1-1 t Value

Land Use / Road	Advanced Commercial	Commercial	Residential	Industrial	Remarks
Arterial Road	2.5 ~ 5.0	2.5 ~ 4.0	1.0 ~ 2.0	2.0 ~ 4.0	
Second Arterial Road	2.0 ~ 4.0	1.5 ~ 3.0	1.5 ~ 2.5	2.0 ~ 3.0	
Collector/Distributor	1.5 ~ 3.0	1.2 ~ 2.0	1.2 ~ 2.0	1.5 ~ 2.5	
Access Road	1.0 ~ 2.0	1.0 ~ 1.5	1.0 ~ 1.5	1.0 ~ 2.0	
Impasse with Turning Space	0.8 ~ 1.0	0.8 ~ 1.0	0.8 ~ 1.0	0.7 ~ 1.0	
Impasse without Turning Space	0.5 ~ 1.0	0.5 ~ 0.8	0.5 ~ 0.8	0.5	

1-2 X Value

Items		Advanced Commercial	Commercial	Residential	Industrial	Remarks
Space Function of Road	(1) Pedestrian Path	W > 6	1.5 ~ 3.0	0.8 ~ 2.0	0.3 ~ 1.0	0.3 ~ 0.5
		6 > W ≧ 3.5	1.0 ~ 1.5	0.5 ~ 0.8	0.2 ~ 0.4	0.2 ~ 0.4
		3.5 > W ≧ 1.5	0.5 ~ 1.0	0.3 ~ 0.5	0.2 ~ 0.3	0.2 ~ 0.3
		1.5 > W	0 ~ 0.5	0 ~ 0.2	0 ~ 0.2	0 ~ 0.2
	(2) Side Walk	W ≧ 6	0.3 ~ 0.8	0.2 ~ 0.5	0.15 ~ 0.3	0.15 ~ 0.3
		6 > W ≧ 3.5	0.2 ~ 0.4	0.1 ~ 0.25	0.1 ~ 0.2	0.1 ~ 0.2
		3.5 > W ≧ 1.5	0.1 ~ 0.3	0.05 ~ 0.2	0.05 ~ 0.15	0.05 ~ 0.15
		1.5 > W	0 ~ 0.2	0 ~ 0.1	0 ~ 0.1	0 ~ 0.1
	(3) Waiting Bay	Installed	0.2	0.1	-	0.1
	(4) Landscape of Road	Good	0.1 ~ 0.3	0.1 ~ 0.2	0.05 ~ 0.2	0.1 ~ 0.2
Structure and Environment of Road	(1) Pavement	Non	-0.1 ~ -0.3	-0.1 ~ -0.3	-0.05 ~ -0.2	-0.1 ~ -0.3
	(2) Gradient d	3% < d < 6%	0 ~ -0.1	0 ~ -0.1	0 ~ -0.1	0 ~ -0.1
		6% ≧ d	0 ~ -0.2	0 ~ -0.2	0 ~ -0.2	0 ~ -0.2
	(3) Curve	Interior Curve	0 ~ -0.05	0 ~ -0.05	-	-
		Exterior Curve	0 ~ 0.05	0 ~ 0.05	-	-
	(4) Road Pollution	No Anti Pollution Measures	-	-	-0.1 ~ -0.5	-
Others						

1-3 S, R, n, m Value

Facilities to be taken up for Calculation			S	R	n	m				Remarks
						Advanced Commercial	Commercial Area	Residential Area	Industrial Area	
Favorable Facility	Transport Facility	Railway Station	800	50	2	0.5 ~ 1.2	0.5 ~ 1.0	0.3 ~ 0.6	0.5 ~ 1.0	
		Bus Stop	300	50	2	0.1 ~ 0.2	0.1 ~ 0.2	0.1 ~ 0.2	0.1 ~ 0.2	
	Park	Play Ground	300	50	2	0.1 ~ 0.3	0.1 ~ 0.3	0.1 ~ 0.3	0.1 ~ 0.3	
		Neighbourhood Park	800	50	2	0.2 ~ 0.3	0.2 ~ 0.3	0.2 ~ 0.5	0.3 ~ 0.5	
		Pedestrian Path	300	50	2	0.05 ~ 0.2	0.05 ~ 0.2	0.05 ~ 0.2	0.05 ~ 0.2	
	School	Day Nursery, Kindergarten	300	50	2	-	0.1	0.1	-	
		Elementary/Junior High School	500	50	2	-	0.1 ~ 0.2	0.2 ~ 0.3	-	
	Culture Social Welfare	Public Hall, Library	300	50	2	-	0.1 ~ 0.2	0.1 ~ 0.2	-	
		Hospital	800	50	2	-		0.1	-	
	Administrative Facility	Post Office, Bank Provincial/City Office	500	50	2	0.1	0.1	0.1	0.1	
	Commercial Facility	Nieghbourhood Market Super Market	500	50	2	-	-	0.3 ~ 0.8	0 ~ 0.5	
Adverse Facility	With no Antimeasures	Prison,	300	-	1	-0.2 ~ -0.5	-0.2 ~ -0.5	-0.2 ~ -0.5	-0.2 ~ -0.5	
		Dump Site	300	-	1	-0.1 ~ -0.5	-0.1 ~ -0.5	-0.1 ~ -0.5	-0.1 ~ -0.5	
		Gas Tank, Transmission Station	100	-	1	-0.1 ~ -0.3	-0.1 ~ -0.3	-0.1 ~ -0.3	-0.1 ~ -0.3	
		Noise, Poisonous Gas	100	-	1	-0.1 ~ -0.3	-0.1 ~ -0.3	-0.1 ~ -0.3	-0.1 ~ -0.3	
Other favourable/Adverse Facility										

1-4 u Value

Commercial Potentiality		Maturity of Commercial Development			Remarks
		High	Medium	Low	
Advanced Commercial Area	High	3.5 ~ 4.0	3.0 ~ 3.5	3.0 ~ 3.5	
	Medium	3.0 ~ 3.5	2.5 ~ 3.0	2.0 ~ 2.5	
	Low	2.0 ~ 2.5	1.5 ~ 2.0	1.0 ~ 1.5	
Commercial Area	High	2.5 ~ 3.0	2.3 ~ 2.5	2.0 ~ 2.3	
	Medium	2.0 ~ 2.3	1.8 ~ 2.0	1.5 ~ 1.8	
	Low	1.5 ~ 1.8	1.2 ~ 1.5	1.0 ~ 1.2	

Subdivision of Lot		Maturity of Urban Development			Remarks
		High	Medium	Low	
Residential/ Industrial Area	Large	1.8 ~ 2.0	1.4 ~ 1.6	1.0 ~ 1.2	
	Medium	1.8 ~ 2.0	1.4 ~ 1.6	0.8 ~ 1.0	
	Small	1.6 ~ 1.8	1.2 ~ 1.4	0.8 ~ 1.0	

1-5 Po, Qo, Value

	Advanced Commercial	Commercial Area	Residential Area	Industrial Area	Remarks
Po (%)	25 ~ 30	25 ~ 30	25	20 ~ 25	
Qo (m/ha)	250 ~ 350	250 ~ 300	250	200 ~ 250	

1-6 Y Value

	Items		
Public Utilities	Improvement of Both Water Supply and Sewerage		0.3 ~ 0.5
	Improvement of Water Supply Only		0.1 ~ 0.3
	Others		0.1 ~ 0.2
Natural Environment	Bad Condition of Drainage		-0.1 ~ -0.2
	Natural Environmental Condition (Sunlight, Humidity)	Bad	-0.1 ~ -0.2
		Excellent	0.1 ~ 0.2
	Others		
Others			

2-1 Additional Vantage Ratio by Side Street

	Corner Lot with 2 Crossing Street	Corner Lot with One Bending Street
Advanced Commercial Area	1.5	0.75
Commercial Area	1.0	0.50
Residential Area	0.5	0.25
Industrial Area	0.5	0.25

2-2 Additional Vantage Ratio by Back Street

	Lot being Sandwiched by 2 Different Street	Lot being Sandwiched by one Street
Advanced Commercial Area	0.200	0.100
Commercial Area	0.150	0.075
Residential Area	0.075	0.040
Industrial Area	0.050	0.025

2-3-(1) Depth Successive Decrease Ratio (%)

Depth (m)	A Advanced Comsercial	B Commercial	C Residential	D Industrial	Depth (m)	A Advanced Comsercial	B Comsercial	C Residential	D Industrial
1	113.2	111.3	107.2	115.5	51	49.9	59.8	77.5	88.6
2	109.6	108.8	106.1	113.3	52	49.8	59.6	77.4	88.5
3	106.2	106.4	104.9	111.3	53	49.8	59.5	77.4	88.4
4	102.8	104.1	103.8	109.5	54	49.7	59.4	77.3	88.3
5	99.6	101.8	102.7	107.9	55	49.7	59.3	77.2	88.2
6	96.4	99.6	101.5	106.5	56	49.6	59.2	77.1	88.1
7	93.4	97.5	100.4	105.3	57	49.6	59.0	77.1	88.1
8	90.4	95.4	99.3	103.9	58	49.5	58.9	77.0	88.0
9	87.6	93.4	98.3	102.8	59	49.5	58.9	76.9	87.9
10	84.9	91.4	97.2	101.8	60	49.4	58.8	76.9	87.9
11	82.2	89.5	96.1	100.9	61	49.4	58.7	76.8	87.8
12	79.7	87.7	95.1	100.1	62	49.3	58.6	76.8	87.7
13	77.3	86.0	94.1	99.3	63	49.3	58.5	76.7	87.7
14	74.9	84.3	93.1	98.6	64	49.2	58.4	76.7	87.6
15	72.7	82.7	92.1	97.9	65	49.2	58.4	76.6	87.5
16	70.6	81.1	91.1	97.3	66	49.2	58.3	76.6	87.5
17	68.6	79.6	90.1	96.7	67	49.1	58.2	76.5	87.4
18	66.7	78.2	89.1	96.2	68	49.1	58.2	76.5	87.4
19	64.8	76.8	88.1	96.7	69	49.1	58.1	76.5	87.3
20	63.1	75.5	87.2	95.2	70	49.1	58.1	76.4	87.3
21	61.5	74.3	86.3	94.7	71	49.0	58.0	76.4	87.2
22	60.0	73.1	85.5	94.3	72	49.0	57.9	76.4	87.2
23	58.6	72.0	84.8	94.0	73	49.0	57.9	76.3	87.1
24	57.3	71.0	84.2	93.6	74	48.9	57.8	76.3	87.1
25	56.1	70.0	83.6	93.3	75	48.9	57.8	76.3	87.1
26	55.0	69.1	83.0	92.9	76	48.9	57.8	76.2	87.0
27	54.1	68.3	82.6	92.6	77	48.9	57.7	76.2	87.0
28	53.2	67.5	82.1	92.3	78	48.9	57.7	76.2	86.9
29	52.4	66.8	81.7	92.1	79	48.8	57.6	76.1	86.9
30	51.7	66.1	81.4	91.8	80	48.8	57.6	76.1	86.9
31	51.1	65.5	81.0	91.6	81	48.8	57.6	76.1	86.8
32	50.7	65.0	80.7	91.3	82	48.8	57.5	76.1	86.8
33	50.3	64.5	80.4	91.1	83	48.8	57.5	76.0	86.8
34	50.0	64.0	80.1	90.9	84	48.7	57.4	76.0	86.7
35	49.8	63.6	79.9	90.7	85	48.7	57.4	76.0	86.7
36	49.6	63.2	79.7	90.5	86	48.7	57.4	76.0	86.7
37	49.5	62.9	79.5	90.4	87	48.7	57.4	76.0	86.6
38	49.3	62.5	79.3	90.2	88	48.7	57.3	75.9	86.6
39	49.1	62.2	79.1	90.0	89	48.7	57.3	75.9	86.6
40	49.0	61.9	78.9	89.9	90	48.7	57.3	75.9	86.6
41	48.9	61.7	78.7	89.7	91	48.6	57.2	75.9	86.5
42	48.7	61.4	78.6	89.6	92	48.6	57.2	75.9	86.5
43	48.6	61.2	78.4	89.5	93	48.6	57.2	75.8	86.5
44	48.5	61.0	78.3	89.3	94	48.6	57.2	75.8	86.5
45	48.4	60.8	78.2	89.2	95	48.6	57.1	75.8	86.5
46	48.3	60.6	78.0	89.1	96	48.6	57.1	75.8	86.4
47	48.2	60.4	77.9	89.0	97	48.6	57.1	75.8	86.4
48	48.1	60.2	77.8	88.9	98	48.6	57.1	75.8	86.4
49	48.1	60.1	77.7	88.8	99	48.5	57.1	75.7	86.4
50	48.0	59.9	77.6	88.7	100	48.5	57.0	75.7	86.3

2-3-(2) Revised Depth Successive Decrease Ratio

Depth (m)	A Advanced Commercial	B Commercial	C Residential	D Industrial	Depth (m)	A Advanced Commercial	B Commercial	C Residential	D Industrial
1	90.0	85.0	80.0	74.0	51	65.3	75.7	87.2	95.9
2	95.0	91.3	85.9	82.3	52	64.9	75.3	87.0	95.7
3	97.0	94.3	89.5	86.8	53	64.6	75.1	86.8	95.6
4	98.0	96.0	92.0	89.7	54	64.3	74.8	86.6	95.4
5	98.6	97.1	93.7	91.6	55	64.0	74.5	86.5	95.3
6	99.1	97.9	95.0	93.1	56	63.7	74.2	86.3	95.2
7	99.4	98.5	96.1	94.1	57	63.4	73.9	86.1	95.1
8	99.7	98.9	96.9	95.0	58	63.2	73.7	86.0	94.9
9	99.8	99.3	97.6	95.7	59	62.9	73.4	85.8	94.8
10	100.0	99.6	98.2	96.2	60	62.6	73.2	85.7	94.7
11	98.5	99.8	98.6	96.7	61	62.4	73.0	85.5	94.6
12	97.0	100.0	99.1	97.1	62	62.1	72.7	85.4	94.5
13	95.6	99.0	99.4	97.5	63	61.9	72.5	85.2	94.4
14	64.2	98.0	99.7	97.8	64	61.7	72.3	85.1	94.3
15	92.1	97.0	100.0	98.0	65	61.5	72.1	85.0	94.2
16	91.5	96.1	99.5	98.3	66	61.2	71.9	84.9	94.1
17	90.2	95.2	98.9	98.5	67	61.0	71.7	84.7	94.0
18	89.0	94.4	98.4	98.7	68	60.8	71.5	84.6	93.9
19	87.8	93.4	97.9	98.9	69	60.6	71.3	84.5	93.8
20	86.6	92.5	97.4	99.0	70	60.4	71.1	84.4	93.7
21	85.4	91.7	96.9	99.1	71	60.2	70.9	84.3	93.6
22	84.3	90.9	96.4	99.3	72	60.1	70.7	84.2	93.5
23	83.2	90.1	95.9	99.4	73	59.9	70.5	84.0	93.4
24	82.2	89.3	96.4	99.5	74	59.7	70.4	83.9	93.3
25	81.1	88.5	95.0	99.6	75	59.5	70.2	83.8	93.3
26	80.2	87.8	94.5	99.7	76	59.4	70.0	83.7	93.2
27	79.2	87.1	94.1	99.8	77	59.2	69.9	83.6	93.1
28	78.3	86.4	93.7	99.9	78	59.0	69.7	83.5	93.0
29	77.4	85.7	93.3	99.9	79	58.9	69.6	83.5	92.9
30	76.6	85.1	92.9	100.0	80	58.7	69.4	83.4	92.9
31	75.8	84.5	92.5	99.7	81	58.6	69.3	83.3	92.8
32	75.0	83.9	92.1	99.5	82	58.5	69.1	83.2	92.7
33	74.2	83.3	91.8	99.2	83	58.3	69.0	83.1	92.6
34	73.5	82.7	91.4	99.0	84	58.2	68.8	83.0	92.6
35	72.9	82.2	91.1	98.8	85	58.0	68.7	82.9	92.5
36	72.2	81.7	90.8	98.5	86	57.9	68.6	82.9	92.4
37	71.6	81.2	91.5	98.3	87	57.8	68.5	82.8	92.4
38	71.0	80.7	90.2	98.1	88	57.7	68.3	82.7	92.3
39	70.5	80.2	89.9	97.9	89	57.5	68.2	82.6	92.2
40	70.0	79.8	89.6	97.7	90	57.4	68.1	82.5	92.2
41	69.4	79.3	89.4	97.5	91	57.3	68.0	82.5	92.1
42	68.9	78.9	89.1	97.3	92	57.2	67.8	82.4	92.1
43	68.4	78.5	88.9	97.1	93	57.1	67.7	82.3	92.0
44	68.0	78.1	88.6	97.0	94	56.9	67.6	82.3	91.9
45	67.6	77.7	88.4	96.8	95	56.8	67.5	82.2	91.9
46	67.1	77.3	88.2	96.6	96	56.7	67.4	82.1	91.9
47	66.7	77.0	88.0	96.5	97	56.6	67.3	82.1	91.8
48	66.4	76.6	87.8	96.3	98	56.5	67.2	82.0	91.7
49	66.0	76.3	87.6	96.1	99	56.4	67.1	81.9	91.7
50	65.4	76.0	87.4	96.0	100	56.3	67.0	81.9	91.6

2-4 Frontage Successive Decrease Ratio

Length of Frontage	Less than 2 m	2 m ↓ 2.5 m	2.5 m ↓ 3.0 m	3.0 m ↓ 3.5 m	3.5 m ↓ 4.0 m	More than 4.0 m
Advanced Commercial Area Commercial Area	0.85	0.88	0.91	0.94	0.97	1.00
Residential Industrial	0.80	0.84	0.92	0.92	0.96	1.00

2-5 Huge Depth Decrease Ratio

Ratio of Depth/Frontage	3.0 ↓ 4.0	4.0 ↓ 5.0	5.0 ↓ 6.0	6.0 ↓ 7.0	7.0 ↓ 8.0	8.0 ↓ 9.0	More than 9.0 m
Decrease Ratio	0.99	0.98	0.97	0.96	0.94	0.92	0.90

2-6 Irregular Angle Decrease Ratio

Angle	Less than 20°	25°	30°	35°	0°	45°	50°
Decrease Ratio	0.70	0.76	0.80	0.83	0.86	0.88	0.90
Angle	55°	60°	65°	70°	75°	80°	85°
Decrease Ratio	0.92	0.935	0.950	0.965	0.985	0.985	0.995

2-7 Different Ground Level Decrease Ratio

Difference in Ground Level	Less than 2.0 m	2.0 m ~ 4.0 m	4.0 m ~ 6.0 m	6.0 m ~ 8.0 m	8.0 m ~ 10.0 m	Higher than 10.0 m
Decrease ratio of lot with higher ground level than street	1.00	0.98	0.94	0.88	0.80	0.70
Decrease ratio of lot with lower ground level than street	0.95	0.90	0.82	0.72	0.60	-

2-8 Standard Share of Right

	Advanced Commercial	Commercial	Residential	Industrial
Right of Ownership	0.3	0.4	0.5	0.6
Right of Lease	0.7	0.6	0.5	0.4

The share of other right should be considered in response to to the peculiarity of the district

Remarks

1. Depth successive decrease ratio Table 2-3-(1) applies to the calculation of unit value index of cul-de-sac part of lot and island lot.

2. Revised successive decrease ratio Table 2-3-(2) applies to the calculation of unit value index of ordinary lot excluding cul-de-sac lot, corner lot, and lot being enclosed by 2, 3 or 4 different streets.

3. The decrease ratio under A (advanced commercial area) applies to the commercial district where there is supposed to be a great difference in land value between front yard and back yard of lot.

4. The decrease ratio under B (commercial area) applies to the commercial district where there is supposed to be least difference in land value between front yard and back yard of lot.

5. The decrease ratio under C (residential area) applies to the residential district where there is supposed to be least difference in land value between front yard and back yard of lot.

6. The decrease ratio under D (industrial area) applies to the industrial district where there is supposed to be least difference in land value between front yard and back yard of lot.

7. Other decrease ratio can apply, if necessary, due to special condition of area and land use and the like.

Remarks to Table 2-5

1. This decrease ratio applies to lots of approximately rectangle shape, being at an angle of less than 85 (degree) to the front street.

2. This decrease ratio applies to lot with the difference in angle of 2 sidelines to the front street between being less than 10 (degree).

3. Angles with which to determine decrease ratio should be angles between the line connecting the center point of frontage and the centroid of lot and the front street.

APPENDIX 3

Guidelines for Calculating Street Value

Calculation of street value, which is prescribed in the standard of land evaluation for ..... Land Readjustment Project should be made in accordance with these guidelines.

1. Procedure for Calculating Street Value

Calculation of street value should in principle proceed as follows:

(1) Drawing up of transport and public facilities maps.

(2) Drawing up of Data - maps showing coefficients necessary for calculation. (Before and after the development).

(3) Calculation of coefficient for the street value before the development.

(4) Calculation of street value index before the development.

(5) Calculation of coefficient for the street value after the development.

(6) Calculation of street value index after the development.

(7) Drawing-up of street value map before the development.

(8) Drawing-up of street value after the development.

(9) Drawing-up of street value index map before the development.

(10) Drawing-up of street value index map after the development.

(11) Final adjustment for street value index.

2. Drawing-up of Transport and Public Facilities Maps

(1) Before the development

Existing streets whose street value should be calculated (standard 6) and facilities and land use which could form the basis for calculation of street value must be surveyed. And all the facilities such as transport facilities (railways, bus services and so on), government/commercial/cultural facilities, schools, and parks, which are supposed to affect land prices of lots shall be drawn up on the topographical map (scale 1/2500) (Facilities being located outside of the project site should be also included as far as they are considered influential to the land prices of lots within the site).

(2) After the development

In the same way as above planned transport and other facilities affecting land prices shall be located on design map (scale 1/1000).

3. Drawing-up of Data-map Showing Coefficients Necessary for Calculation

(1) Before the development

① Data map for Calculating street coefficients
Data map contains such items and figures as follows:

a. Street Number

According to STANDARD 8 streets should be divided into sections which forms blocks. Street numbers are put in the middle of the sections on the map. When the section of street happens to be either winding or too long, the section should be modified.

b. Width of Street (Right of way)

The width of street shall be measured by section on the map and recorded along the section on the map. (unit 0.1 m)

c. t Value

t value presents street characteristics in terms of street network and continuity.

The more important the street is in transportation, the more influential the street is to land evaluation.

t value shall be selected within the range being set in the STANDARD Table 1-1 taking into consideration balanced weight with accessibility coefficient and land coefficient.

t value is to be written under the item of the width of street on the map.

d. X value

X value presents characteristics of street construction in terms of pavement condition (paved or unpaved), construction of separate sidewalk, grading, curves and scenery along the street.

X value shall be selected from the list established in the STANDARD Table 1-2.

② Data map for calculating accessibility coefficient.

Data map contains such items and figures as follows.

a. Street Numbers

Street numbers are transcribed from the data map (1)-①

b. Distance from the facilities influencing land price

Distance from the facilities to the location of the street section shall be measured and recorded on the map.

(Distance should be road distance in principle, but can be direct distance for simplification purpose).

3 Data map for calculating land coefficient

Data map contains such items and figures as follows:

a. Street number

Street number are transcribed from the data map (1) -①

b. U value

U value represents volume of building floor space on a site, building density in terms of lot density.

Appropriate figures for U value should be selected from the STANDARD Table 1-4.

c. Po, P value

Po is standard ratio of public open land which are given in STANDARD Table 1-5.

P is ratio of public open land in the project site.

d. Qo, Q value

Qo is standard street density (length of street (m)/area (ha). These are given in the STANDARD Table 1-5.

Q is street density in the project site.

f. Y value

Y value represents availability of water supply and disposal facilities, accessibility to water works, availability of sun light (which varies depending upon the direction of the street the site faces) and natural environment. These are given in the STANDARD Table 1-6.

(2) After the development

① Data map for calculating street coefficients. Data map which contains data for calculating street coefficients should be prepared on the basis of action plan (public facility development plan, design map, and so on).

a. Street number

In principle, streets are divided into sections representing each block.

However, sections should be adjusted, if necessary, in response to different land uses in a block, to attain proper relationship with other coefficients and balance between before and after development.

b. Width of street

Widths of street are transcribed from the street development plan in the action plan.

c. t value

t values are determined referring to the STANDARD Table 1-1 in consideration with balanced weight with accessibility and land coefficients.

d. X value

Appropriate figure for X value shall be selected from the STANDARD Table 1-2.

(2) Data map for calculating accessibility coefficient.
Data map contains such items and figures as follows:

a. Street number

Street numbers are transcribed from the data map (2)-(1)

b. Distance from the facilities influencing land prices.

The same as (1) - (2) - b

3 Data map for calculating land coefficient
Data map contains such items and figures as follows:

a. Street number

The same as (2) - (2) - a

b. U value

Based on the land use plan formulated in the action plan, appropriate figures for U value should be selected from the STANDARD Table 1-4.

c. Y value

Based on the public facility development plan in the action plan appropriate figure for Y value should be selected from the STANDARD Table 1-6.

4. Calculation of Coefficient for the Street Value Index before the Development

Street coefficient, accessibility coefficient and land coefficient for calculating the street value index are computed following the format 1~3.

(1) Street coefficient

(use the format-1)

① Street number

Street numbers are transcribed from the data map for street coefficient (3 - (1) - ①)

② Width of street (W)

Widths of street are transcribed from the data map for street coefficient (3 - (1) - ①)

③ F(w)

Appropriate formula for F(w) should be selected from the STANDARD Formula-1.

④ t

t value are transcribed from the data map for street coefficient (3 - (1) - ①)

⑤ t.F(W)

t value (④) muliplied by F(W) (③) is t.F(W)

⑥ ΣX

X values are transcribed from the data map for street coefficient (3 - (1) - ①)

⑦ Street coefficient

t.F(w)+ΣX

(2) Accessibility coefficient

(use the format-2)

① Street number

The same as 4 - (1) - ①

② Name of facilities to be considered

Real names of facilities shall be recorded in the column.

a. S value

S values show degree of range of effects, which varies depending on the nature of the said facility. S values are given in the STANDARD Table 1-3.

b. m value

m value represents the degree of influence of the said facility. Taking into consideration the actual condition of the facilities an appropriate M value should be selected from the STANDARD Table 1-3.

c. n value

n value shows a successive decrease rate of effects of the said facility in accordance with distance. N value should be selected from the STANDARD Table 1-3.

d. s value

s value presents the distance between the said facility and the evaluation point of the street value.

s values are transcribed from data map for accessibility coefficient 3 - (1) - ②

e. $m\left(\frac{S-s}{S-R}\right)^n$

This value shows the degree of influence over the land price at the evaluation points in accordance with the distance from the said facility.

3 Accessibility coefficient

Accessibility coefficient of a section of street is an aggregation of $m\left(\frac{S-s}{S-R}\right)^n$ over all facilities listed.

(3) Land coefficient

(use the format-3) (See page....)

① Street number

The same as 4 - (1) - ①

② U value

U values are transcribed from 3 - (1) - ③

③ P value (ratio of public open space)

a Project site should be divided into districts (roughly, a few replotting design districts or major land use district).

b District areas and areas of public open space are measured on the map, and then the ratio of public open space (area of public open space/district area) is calculated by district.

4 Q value (street density)

Total lengths of streets of more than 4 m width shall be measured by district and then street density (Total length of streets/district area is calculated by district).

5 Po

Po is standard ratio of public open land which is given in the STANDARD Table 1-5.

6 Qo

Qo is standard street density (length of street in district/district area), which is given in the STANDARD Table 1-5.

7 F(P.Q)

F(P.Q) is computed as follows: $F(P\,Q) = 1 + \sqrt{\left(\frac{P}{Po}\right) \times \left(\frac{Q}{Qo}\right)}$

8 U.F(P.Q)

U value is multiplied by F(P.Q)

9 Y

Y values are transcribed from data map for calculating Land coefficient 3 - (1) - ③

10 Land coefficient

Land coefficient is a summation of U.F(P.Q) and EY

5. Calculation of Street Value Index before the Development

"Street value" is the summation of 3(three) coefficients which were calculated in Chapter 4. (Street coefficient + accessibility coefficient + land coefficient)

With the maximum street value calculated being equivalent to an index of 1,000 units, street value indices of other streets are calculated following the format-4.

① Street number

The same as 3 - (1) - ①

② Street coefficient

Street coefficient shall be transcribed from 4 - (1) - ⑦

③ Accessibility coefficient

Accessibility coefficient shall be transcribed from 4 - (2) - ③

④ Land coefficient

Land coefficient shall be transcribed from 4 - (3) - ⑩

⑤ Street value

Street value is equal to the summation of the street, accessibility and land coefficients.

⑥ Street value index

when the street with the highest street value is given an index of 1,000 units, street value indices of other streets are calculated as follows:

$$\text{Street value index} = \text{street value} \times \frac{1{,}000 \text{ units}}{\text{highest street value}}$$

(Minimum unit shall be either 1 or 5 or 10 by rounding off)

⑦ Length of street section

Length of each street section is measured on the data map for street coefficients (3 - (1) - ①)

⑧ R x L

Length of each street section is multiplied by street value index.

6. Calculation of Coefficients for Street Value after the Development

Street coefficient, accessibility coefficient and land coefficient for calculating the street value index after the development are computed following the format 1-3.

Calculation method of coefficients for street value after the development is exactly same as that for before the development, which is described in Chapter 4.

(1) Street coefficient

(use the format - 1)

① Street number

Street numbers are transcribed from the data map for street coefficient 3 - (2) - ①

② Width of Street (W)

Widths of streets are transcribed from the data map for street coefficient 3 - (2) - ①

③ F(w)

Appropriate formula for F(w) should be selected from the STANDARD Formula.

④ t

t values are transcribed from the data map for street coefficient 3 - (2) - ①

⑤ t.F(w)

t value (④) is multiplied by F(w) (③)

⑥ ΣY

X values are transcribed from the data map for street coefficient 3 - (2) - ①

⑦ Street coefficient

t.F(W)+ΣX

(2) Accessibility coefficient

(use the format - 2)

① Street number

The same as 6 - (1) - ①

② Name of facilities

Real names of public facilities shall be recorded in the column.

a. S value

S values are selected from the STANDARD Table 1-3.

b. m value

m values are selected from the STANDARD Table 1-3.

c. n value

n values are selected from the STANDARD Table 1-3.

d. s value

s values are transcribed from the data map for accessibility coefficient 3 - (2) - ②

e. $m\left(\frac{S-s}{S-R}\right)^n$

Calculate $m\left(\frac{S-s}{S-R}\right)^n$ based on the values set above.

3 Accessibility coefficient

Accessibility coefficient of a section of street is an aggregation of $m\left(\frac{S-s}{S-R}\right)^n$ over all the facilities listed.

(3) Land coefficient

(use the format - 3)

① Street number

The same as 6 - (1) - ①

② U value

U values are transcribed from 3 - (2) - ③

③ P value (ratio of public open land)

a Project site should be divided into districts (roughly a few replotting design districts or major land use districts)

b District areas and areas of public open land are measured on the map, and then the ratios of public open land (area of public open land/district area) are calculated by district.

④ Q value (street density)

Total length of streets of more than 4 m width shall be measured by district and then street density (Total length of streets/district area) is calculated by district.

⑤ Po

Po is the standard ratio of public open land, which is given in the STANDARD Table 1-5.

⑥ Qo

Qo is the standard street density (length of street in district/district area), which is given in the STANDARD Table 1-5.

7 F(P.Q)

F(P.Q) is computed as follows: $F(P.Q) = 1 + \sqrt{\left(\frac{P}{P_0}\right) \times \left(\frac{Q}{Q_0}\right)}$

8 U.F(P.Q)

U value is multiplied by F(P.Q)

9 ΣY

Y values are transcribed from the data map for calculating coefficient 3 - (2) - ③

10 Land coefficient

Land coefficient is a summation of U.F(P.Q) and EY

7. Calculation of Street Value Index after the Development

"Street value" is the summation of 3(three) coefficients which are calculated in Chapter 6.

With the maximum street value calculated being equivalent to an index of 1,000 unit, street value indices of other streets are calculated following the format-4.

① Street number

The same as 3 - (2) - ①

② Street coefficient

Street coefficient shall be transcribed from 6 - (1) - ⑦

③ Accessibility coefficient

Accessibility coefficient shall be transcribed from 6 - (3) - ③

④ Land coefficient

Land coefficient shall be transcribed from 6 - (3) - ⑩

⑤ Street value

Street value is equal to summation of street, accessibility and land coefficients.

⑥ Street value index

When the street with the highest street value in the project site before the development is given an index of 1,000 unit, street value indices of other street are proportionaly calculated as follows:

Street value index = Street value X $\frac{1{,}000 \text{ units}}{\text{highest street value before the development}}$

⑦ Length of street section

Length of each street section is measured on the data map for street coefficients (3 - (2) - ①)

⑧ R x L

Length of each street section is multiplied by street value index.

8. Drawing-up of Street Value Map before the Development

Coefficient and values being calculated above are shown in the middle of street section on the existing topographical map (scale 1/1000) in the following order:-

S	(Street coefficient)	5 - ②
A	(Accessibility coefficient)	5 - ③
L	(Land coefficient)	5 - ④
S.V	(Street value)	5 - ⑤

9. Drawing-up of Street Value Map after the Development

Coefficients and values being calculated above are shown in the middle of each street section on the design map of the action plan (scale 1/1000) in the following order:-

S	(Street coefficient)	7 - ②
A	(Accessibility coefficient)	7 - ③
L	(Land coefficient)	7 - ④
S.V	(Street value)	7 - ⑤

10. Drawing-up of Street Value Index Map before the Development

Street value index map (scale 1/1000) shows the following information:

① Street number 5 - ①

② Street value index 5 - ⑥

③ Block number

Blocks are the areas enclosed by either streets, rivers, creeks or railways.

Block numbers are placed in the middle of each block.

④ Block area

Block areas are measured by..... (or.....)

11. Drawing-up of Street Value Index Map after the Development

Street value index map (scale 1/1000) shows the following information:

① Street number 7 - ①

② Street value index 7 - ⑥

③ Block number

Block numbers are placed in the middle of blocks which are determined in the action plan.

④ Block area

Block areas are measured by ..... (or .....)

12. Final Adjustment for Street Value Index

(Street value index before the development)

The street value index should be adjusted in case there are streets whose street value index turnes out to be greatly different from the land value evaluation which is generally approved in property tax assessment, real property transaction and appraisals etc.

After such adjustment as mentioned above, the street value index should be finalized (Format-5)

(Street value index after the development)

Street value indices being calculated above shall be checked through comparison between "average contribution ratio of the project site "and" affordable share of each street value

$$\left(1 - \frac{\text{Street value index before the development}}{\text{Street value index after the development}}\right)"$$

In the case where a different great results, the type of adjustment described above must be carried out.

FORMAT - 1 Calculation of Street Coefficient (before / after) the Development

Street (Section) No.	Width of Street W(m)	F(W)	t	t·F(W)	Pave	Side Walk	Gradient	Winding (Curves)	Scenery			ΣX	Street Coefficient t.F(w)+ΣX	
					X1	X2	X3	X4	X5	X6	X7			

A3-14

FORMAT - 2 Calculation of Accessibility Coefficient $\left(\begin{matrix}\text{before}\\ \text{after}\end{matrix}\right)$ the Development

Street (Section) No.	Name of Facilities S = m = n = R =		Name of Facilities S = m = n = R =						Accessibility Coefficient $\Sigma m\left(\frac{S-s}{S-R}\right)^n$	Remarks
	S	$m\left(\frac{S-s}{S-R}\right)^n$	S	$m\left(\frac{S-s}{S-R}\right)^n$						

FORMAT - 3 Calculation of Land Coefficient (before / after) the Development

Street (Section) No.	U	P	Q			F(P,Q)	U·F(P,Q)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	ΣX	Land Coefficient U·F(P,Q)+ΣY	Remarks

FORMAT - 4 Calculation of Street Value Index (before / after) the Development

Street (Section) No.	Street Coefficient	Accessibility Coefficient	Land Coefficient	Street Value R′	Street Value Index R	Length of Street (Section) (m) L	Street Value Index X Length of Street R x L	Remarks
						Highest street value before the development		

FORMAT - 5 Final Adjustment for Street Value Index (before / after) the Development

Street (Section) No.	Calculated Street Value Index	Finally Adjusted Street Value Index

Street (Section) No.	Calculated Street Value Index	Finally Adjusted Street Value Index

Street (Section) No.	Calculated Street Value Index	Finally Adjusted Street Value Index

APPENDIX 4

GUIDELINES FOR CALCULATION LOT LAND VALUE

1. Standard article 6 (Identification of streets whose street value should be calculated)

2. Standard article 11 (Lot index)

3. Standard article 13 (Calculation for ordinary lot)

4. Standard article 14 (Corner lot)

5. Standard article 16 (Lot being adjacent to 3 or 4 different streets)

6. Standard article 17 (Island lot)

7. Standard article 20 (Lot including private streets and others)

8. Standard article 22 (Evaluation of block)

9. Standard article 28 (Document of land evaluation)

Legend

In these guidelines the following symbols are used:-

Street value index	R1, R2.....
Depth successive decrease ratio	
Revised DSDR	(revised)
Frontage length of lot	
Depth of lot	h
Area of lot	A
Additional vantage ratio by side street	K-side
Additional vantage ratio by back street	K-back
Unit land value index (per m)	@
Total land value index	V
Frontage successive decrease ratio	n-frontage
Huge depth decrease ratio	n-huge
Triangle decrease ratio	n-triangle
Revised Triangle decrease ratio	n-revised triangle
Irregular angle decrease ratio	n-Irregular angle
Irregular shape decrease ratio	n-Irregular shape
Cul-de-sac decrease ratio	n-cds
Island decrease ratio	n-island
Cliff decrease ratio	n-cliff
Different ground level decrease ratio	n-different

In these guidelines "C" being placed before the figures of street value index represents the "C" of land classification, which denotes residential area.

1. Standard article 6 (Streets whose street value should be calculated)

(1) Streets whose street value should be calculated are to include streets which are usually used by general traffic regardless of their land use.

(2) Under the standard 6 are sites of rivers, canals creeks or railways, which are used for transportation, cargo handling and the like, when benefits accruing from rivers, canals, creeks or railways must be taken into consideration for land evaluation.

2. Standard article 11 (Lot index)

(1) Lengths of lot frontage and depth which are to be used for calculation of lot index per m must be measured on the existing land map and finalized lots map (scale 1/500), except in special case.

(2) A special case is defined as a case in which lots adjacent to one another belong to one sole owner and are in united land use.

3. Standard 13 (Calculation on ordinary lot)

(1) Rectangle lot

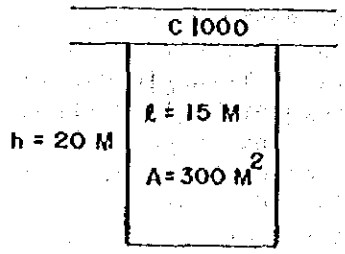
To calculate unit land value index of rectangle lot (Fig. -1), street value index (R) of the street the lot faces is multiplied by depth successive decrease ratio (Table 2-3-(1)).

Unit land value index (@)

= street value index (R) x depth successive decrease ratio (α)

= $1{,}000 \times \frac{97.4}{100} = 974$ units

Fig. – 1



Total land value index (V)

= @ x Area of lot

= 974 x 300 = 292,000 units

Remark

1. This method of calculation is correspondingly applied to lot with 2 sidelines being approximately at a right angle (85° - 95°) to the street.

2. When a lot has different lengths of sidelines, the same method is applied with the length of the center line between the 2 side lines running in parallel presumed to be the theoretical depth of the lot.

However in the following cases, the result must be modified by the decrease ratio:

1 When length of frontage (ℓ;) is less than 4m (ℓ<4m) . To be modified by Frontage successive decrease ratio (n (frontage)) shown in Table 2-4.

2 When depth of lot is more than 3 times the frontage length (h/ℓ≥3).

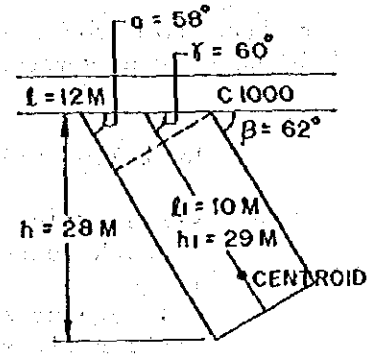
To be modified by huge decrease ratio (n-huge) shown in Table 2-4.

(2) Rectangle lot being at irregular angle to street.

The lot shown in Fig.-2 has 2 parallel side lines with the line connecting the center point of frontage and centroid of the lot being at a angle of less than 85 to the street.

Applying the same method as described above (1) to this case, the street value index (R) is multiplied by depth successive decrease ratio (Table 2-3-(1)) and irregular angles decrease ratio (standard 18-2-(5), Table 2-6).

Fig. - 2



Unit land value index (@)

= street value index (R)
x depth successive decrease ratio (μ)
x irregular angles decrease ratio
(n (angle))

= R x μ x n (angle)

= $1{,}000 \times \frac{93.7}{100} \times 0.935$

= 876.0 876 units

a. When ℓ < 4m ..... Decrease Ratio n (frontage)
b. When h / ℓ ≧ 3 ..... Decrease Ratio N (huge)

(3) Triangle lot

To calculate the unit land value of triangle lot with one side of the

lot being attached to the street (Fig. 3), the street value index of the street is multiplied by depth successive decrease ratio at 2/3 (two third) of the depth of triangle lot and triangle decrease ratio which is set at 0.9 in article 18-(3) in the standard.

Unit land value index @

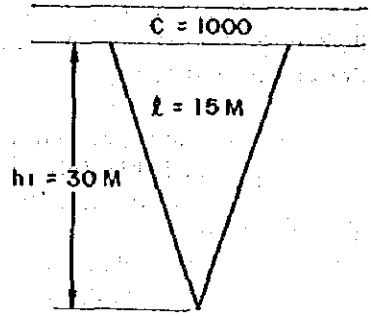
= street value index (R)
x depth successive decrease ratio (u)
x triangle decrease ratio n (triangle)

= R x ux n(triangle)

= $1{,}000 \times \frac{97.4}{100} \times 0.90$

= 876.6 ≒ 877 units

Fig. - 3



Theoretical depth = $\frac{2}{3}$ h = 20m

a. When $\ell < 4$m ----- Decrease Ratio n(frontage)
b. When h /$\ell \geqq 3$ ----- Decrease Ratio n(huge)

(4) Irregularly Shaped Lot

To calculate the unit land value index of an irregularly shaped lot (Fig. 4), the street value index of the street is multiplied by depth successive decrease ratio at the depth of the lot, which is theoretically calculated by dividing the area of the lot by the length of the lot frontage, and the irregular shape decrease ratio ranging from 1.00 to 0.90, which is stipulated in article 1 : -16) of the standard.

The irregular shape decrease ratio is determined within the range of 1.00 to 0.90 depending on the degree of irregularity of the lot.

Unit land value index (@)

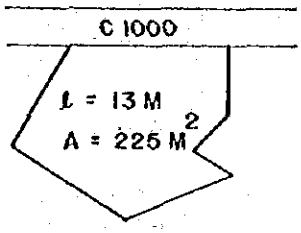
= street value index (R)
x depth successive decrease ratio (u)
x irregular shape decrease ratio n (irregular shape)

= R x ux n(irregular shape)

= $1{,}000 \times \frac{98.9}{100} \times 0.95$

= 939.5 ≒ 940 units

Fig - 4



Theoretical depth h = $\frac{A}{l} = \frac{225}{13} = 17.3m$

a. When $l < 4m$ ----- Decrease Ratio n(frontage)
b. When $h / l \geqq 3m$ ----- Decrease Ratio n(huge)

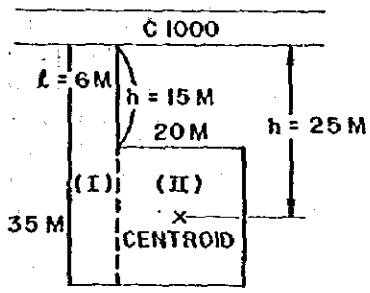
(5) Cul-de-sac lot

To calculate the unit land value index of a cul-de-sac lot (Fig. 5), an aggregate of the total land value index of the 2 (two) parts, being shown in Fig. 5, which the cul-de-sac lot is partitioned into, is divided by the total area of lot.

(I) Part of lot ---- The same method with (1) rectangle lot.

(II) Part of lot ---- To calculate the total land value index of (II) part of lot, the street value is multiplied by depth successive decrease ratio (Table 2-3-(1)) at the depth which is equivalent to the length between the street and centroid of (II) part of lot, and cul-de-sac decrease ratio (0.95) being set in the article 18-(7) of the standard, and the area of the part of lot.

Fig - 5



(I) Part of lot

Total land value index (V')

= R x μ x A(I)

= 1,000 x $\frac{91.1}{100}$ x 210 = 191,310 units

(II) Part of lot

Total land value index (V')

= street value index (R)
x depth successive decrease ratio (μ)
x cul-de-sac decrease ratio n(cul-de-sac)
x the area of the part of lot (A)

= 1,000 x $\frac{83.6}{100}$ x 0.95 x 400 = 317,680 units

Unit land value index (@)

= $\frac{\text{Summation of total land value indices of I and II part}}{\text{Total area of the lot}}$

$$= \frac{V' \text{ of (I) Part} + V' \text{ of (II) Part}}{A \text{ of (I) Part} + A \text{ of (II) Part}}$$

$$= \frac{191,310}{210} + \frac{317,680}{400} = 834.4 \fallingdotseq 834 \text{ units}$$

As for (I) Part

a. When $l < 4m$ ----- Decrease Ratio n(frontage)
b. When $h / l \geq 3$ ----- Decrease Ratio n(huge)

As for (II) Part

c. When the shape of lot is irregular ---- Decrease Ratio n(irregular shape)

(6) Inclining (Cliff lot)

To calculate the unit land value index of a lot including cliffs (Fig. 6) an aggregate of total land value indices of ordinary and cliff parts which the lot is partitioned into is divided by the total area of lot.

(I) Part of lot ---- The same method with (I) rectangle lot

(II) Part of lot ---- To calculate the total land value index of cliff part of the lot, street value is multiplied by depth successive decrease ratio (Table 2-3-(1)) at the depth which is equivalent to the length between the street and centroid of (II) part of the lot, and cliff decrease ratio (0.5-0.3) being set in the article 18-(9) of the standard, and the area of the part of lot.

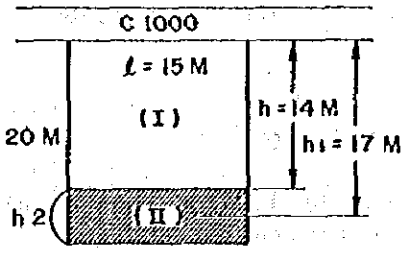
(I) Part of lot ----- ordinary lot

Total land value index (V')

$$= R \times u \times A(I)$$

$$= 1,000 \times \frac{99.7}{100} \times 210 = 209,370 \text{ units}$$

Fig. - 6



(II) Part of lot ---- Cliff lot

Total land value index (V')

= street value index (R)
x depth successive decrease ratio (μ)
x cliff successive decrease ration n(cliff)
x the area of the part of lot (A)

= R x μ x n(cliff) x A
= $1,000 \times \frac{90.1}{100} \times 0.4 \times 90$ = 32,436 units

Unit land value index

= $\frac{\text{Summation of total land value indices of (I) and (II) part}}{\text{Total area of the lot}}$

= $\frac{V' \text{ of (I) Part} + V' \text{ of (II) Part}}{A \text{ of (I) Part} + A \text{ of (II) Part}}$

= $\frac{209,370 + 32,436}{210 + 90}$ = 806.0 ≒ 806 units

On (I) and (II) part respectively

a. When $l < 4m$ ---- Decrease Ratio n(frontage)
b. When $h / l \geq 3$ ---- Decrease Ratio n(huge)

4. Standard article 14 (Corner lot)

(1) Ordinary corner lot

As prescribed in the standard article 14, the unit land value index is calculated by dividing an aggregate of both total land value index by front street and additional vantage index by side street by the area of lot.

The unit land value index multiplied by the area of the lot is the total land value index.

Unit land value index (@)

= [street value index (R1) x depth successive decrease ratio (μ) x area of lot (A)
+ street value index (R2) x side frontage length of lot (h) x additional vantage ratio (k-side)]
/ area of lot

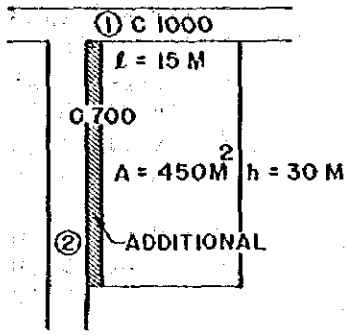
$$= \frac{R1 \times \ \times A + R2 \times h \times (k\text{-side})}{A}$$

Fig. - 7

$$= \frac{(1{,}000 \times \frac{92.9}{100} \times 450 + 700 \times 30 \times 0.5)}{450}$$

$$= \frac{418{,}050 + 13{,}500}{450}$$

$$= \frac{431{,}550}{450} = 959 \text{ units}$$



Total land value index

$$= @ \times A = 959 \times 450 = 431{,}550 \text{ units}$$

The frontage length of a corner lot is the summation of the front and side frontage lengths.

(2) Special corner lot

Fig. 8 shows a special corner lot with the value of $\left(\frac{\text{street value of side street}}{\text{street value of front street}}\right)$ being more than 0.8, and the side street frontage being longer than the front street frontage, as prescribed in the standard 14-3. The unit land value index of the special corner lot is larger than the total land value index being calculated by the method for the ordinary corner lot and the total land value index being calculated with the side street being the front street and the front street being the side street.

a. Calculation on front street

Total land value index (V'1)

= [street value index of front street (R1)
x depth successive decrease ratio (μ)
x the area of lot (A)]
+ [street value index of side street (R2)
x side frontage length (h)
x additional vantage ratio (k-side)]

$$= R1 \times \mu \times A + R2 \times h \times (k\text{-side})$$

$$= 1{,}000 \times \frac{88.4}{100} \times 675 + 950 \times 45 \times 0.5$$

$$= 596{,}700 + 21{,}375 = 618{,}075 \text{ units}$$

b. Calculation on side street

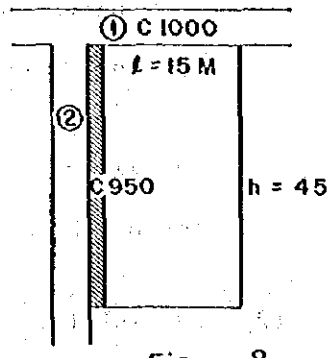


Fig. – 8

Total land value index (V'2)

= [R2 x μ x A + R1 x ℓ x (k-side)]

= 950 x $\frac{100}{100}$ x 675 + 1,000 x15 x 0.5

= 641,250 7,500 = 648,750 units

As V2' is bigger than V1' , unit land value index @ is
V2' / A = $\frac{648,750}{675}$ = 961.1 ≒ 961 units

Total land value index = unit land value index @
x the area of lot (A)

= @ x A = 961 x 675

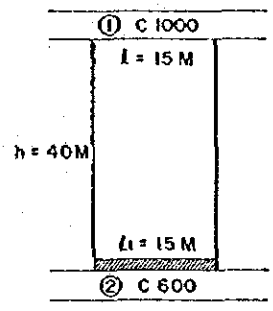
= 648,675 units

5. Standard article 15 (Lot being sandwiched between two different streets)

(1) Ordinary lot

As prescribed in standard article 15, the unit land value index is calculated by dividing aggregate of both total land value index by front street and additional vantage index by back street by the area of the lot.

Fig. – 9



Total land value index (V')

= [street value index of front street (R1)
x depth successive decrease ratio (μ)
x the area of lot (A)]
+ [street value index (R2)
x depth successive decrease ratio (μ)
x additional vantage ratio (k-back) x $\left(\frac{R2}{R1}\right)^2$
x the area of lot (A)]

= 1,000 x $\frac{89.6}{100}$ x 600 + 600 x $\frac{89.6}{100}$ x 0.075 x$\left(\frac{600}{1,000}\right)^2$ x 600

= 537,600 + 8.709 = 546,309 units

Unit land value index @

$$= \frac{V}{A} = \frac{546,309}{600}$$

$$= 910.5 \fallingdotseq 911 \text{ units}$$

The depth which the depth successive ratio is selected at is h_2.

(2) Special lot

Special lot shown in Fig. 10 is partitioned into 3 parts, total land value index of which is calculated respectively as follows :

(I) Part of lot ---- Calculation method for ordinary lot being sandwiched between 2 different streets as shown above.

(II) and (III) Part of lot ---- larger value should be selected from the results of calculation by two different methods as follows :

1 The same method as applied to the cul-de-sac lot described in section (5) but additional vantage ratio of back street (n-back) is added to the result.

2 The same method as applied to the ordinary rectangle lot described in section (I).

(I) Part of lot

Total land value of I part of lot (V-I)

= [street value of front street (R1)
x depth successive decrease ratio (u)
x area of I part of lot (A-I)]
+ [street value of back street (R2)
x depth successive decrease ratio (u)
x additional vantage ratio (n-back)
$\times \left(\frac{R2}{R1}\right)^2$ x the area of lot (A-II)]

$$= 1,000 \times \frac{91.4}{100} \times 272 + 600 \times \frac{91.4}{100} \times 0.075 \times \left(\frac{600}{1,000}\right)^2 \times 272$$

$$= 248,608 + 4,027 = 252,635 \text{ units}$$

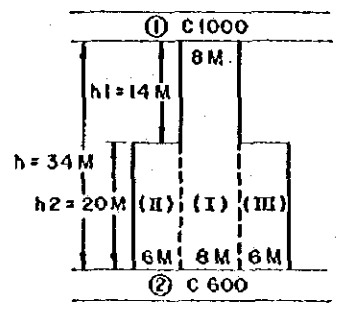


Fig.-10

(II) Part of lot

Total land value index of II part of lot (V′-2)

= [street value of front street (R1)
x depth successive decrease ratio (μ)
x cul-de-sac decrease ratio (n-cul-de-sac)
x area of II part of lot (A-II)
+ [street value of back street (R2)
x depth successive decrease ratio (μ)
x additional vantage ratio (k-back)
$\times \left(\frac{R2}{R1}\right)^2$ x the area of lot (A-II)

$$= 1{,}000 \times \frac{84.2}{100} \times 0.95 \times 120 + 600 \times \frac{97.4}{100} \times 0.075 \times \left(\frac{600}{1{,}000}\right)^2 \times 120$$

= 95,988 + 1.893 = 97,881 units

Total land value index of II part of lot (V″-2)

= street value index of front street (R2)
x depth successive decrease ratio ( )
x the area of lot (A-II)

$$= \frac{600 \times 97.4 \times 120}{100}$$

= 70.128 units

As V′-2 is larger than V′-2, the total land value index (V-II) is 97.881 units.

Unit land value index (@)

$$= \frac{(V\text{-}I) + (V\text{-}II) + (V\text{-}III)}{\text{Total area of lot (A)}}$$

$$= \frac{252.635 + 97.881 + 97.881}{512} = 876 \text{ units}$$

Total land value index (V)

= @ x A = 876 x 512 = 448,152 units

a. In the case of (I) part of lot

The depth at which the huge depth decrease ratio is selected from Table 2-5, should be the length of h1 shown in Fig. 10.

b. In the case of (II) and (III) part of lot

The frontage length of part (II) and (III) should be a summation of lengths of frontage of part (I), (II), (III) of lot.

6. Standard article 16 (Lot being adjacent to 3 or 4 different streets)

(1) To calculate unit land value index of lot being enclosed by 3 different streets, an aggregate of the total land value index calculated ordinary rectangle lot according to the calculation method stipulated in section (1), the additional vantage index by side street and the additional vantage index by back street by the area of lot.

Total land value index (V')

= [street value of front street (R1)
x depth successive decrease ratio (u)
x area of lot] + [street value index of side street (R2) x side frontage length (h)
x additional vantage ratio by side street (k-side)]
+ [street value index of back street (R3)
x depth successive decrease ratio (u)
x additional vantage ratio by back street (k-back)
$\times \left(\frac{R3}{R1}\right)^2$ x area of lot (A)]

= R1 x x A + R2 x h x (k-side) + R3 x x (k-back)
$\times \left(\frac{R3}{R1}\right)^2$ x A

= $1{,}000 \times \frac{88.4}{100} \times 1{,}350 + 700 \times 45 \times 0.5 + 500 \times \frac{88.4}{100}$
$\times 0.075 \times \left(\frac{500}{1{,}000}\right)^2 \times 1{,}350$

= 1,193,400 + 15,750 + 11,187

= 1,220,337 units

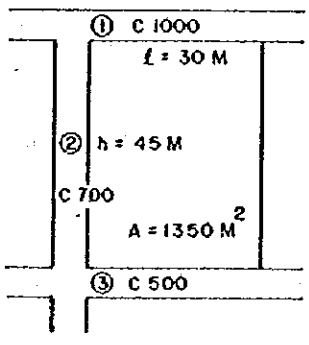


Fig.- 11

Unit land value index (@)

= $\frac{V}{A} = \frac{1{,}220{,}337}{1{,}350} = 903.9 \fallingdotseq 904$ units

Total land value index

= @ x A = 904 x 1,350

= 1,220,400 units

(2) To calculate unit land value index of lot being enclosed by 4 different streets, an aggregate of total land value index calculated as that of ordinary rectangle lot, additional vantage indices by 2 side street and additional vantage index by back street by the area of lot.

Total land value index (V')

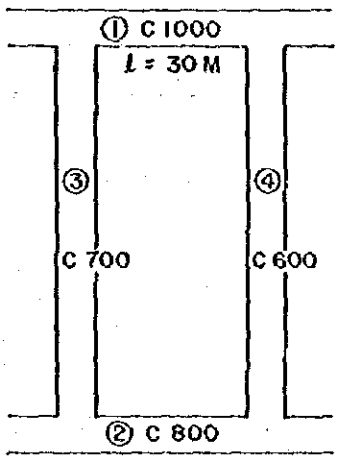
= [street value of front street (R1)
x depth successive decrease ratio (μ)
x area of lot (A)]
+ [street value of side street (R3)
x side frontage length (h)
x additional vantage ratio by side street (k-side)]
+ [street value of side street (R4)
x side frontage length (h)
x additional vantage ratio by side street (k-side)]
+ [street value of back street (R2)
x depth successive decrease ratio (μ)
x additional vantage ratio by back street (k-back)
$\times \left(\frac{R2}{R1}\right)^2$ x area of lot (A)]

= R1 x μ x A + R3 x h x (k-side) + R4 x h x (k-side) + R2 x μ x (k-back) $\times \left(\frac{R2}{R1}\right)^2$ x A

= $1,000 \times \frac{83.4}{100} \times 2,400 + 700 \times 80 \times 0.5 + 600 \times 80 \times 0.5$
$+ 800 \times \frac{83.4}{100} \times 0.075 \times \left(\frac{800}{1,000}\right)^2 \times 2,400$

= 2,130,400 units

Fig.-12



Unit land value index (@)

= $\frac{V'}{A} = \frac{2,130,400}{2,400}$

= 887.6 ≒ 888 units

Total land value index (V)

= @ x A = 888 x 2,400

= 2,131,200 units

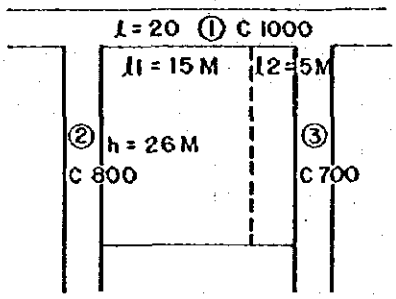
(3) Special case of lot being enclosed by 3 streets

In the case of a lot, the frontage length of which is less than 30m, the calculation of additional vantage index by side streets shall be conducted as follows :

Additional vantage by second street is to be given only to the part of lot stretching 15m from the second street.

Additional vantages by third street is to be given to the rest of the lot.

Fig - 13



Total land value index (V′)

= [street value of front street (R1)
x depth successive decrease ratio (α)
x area of lot]
+ [streets value of second street (R2)
x side frontage length (h)
x additional vantage ratio by side street (k-side)]
+ [street value of third street (R3)
x side frontage length (h)
x additional vantage ratio by side street (k-side)
$\times \frac{\text{frontage length} - 15}{15}$]

$= R1 \times \alpha \times A + R2 \times h \times (k\text{-side}) + R3 \times h \times (k\text{-side}) \times \frac{\ell 2}{15}$

$= 1{,}000 \times \frac{94.5}{100} \times 520 + 800 \times 26 \times 0.5 + 700 \times 26 \times 0.5 \times \frac{5}{15}$

= 491,400 + 10,400 + 3,033 = 504,833 units

Unit land value index (@)

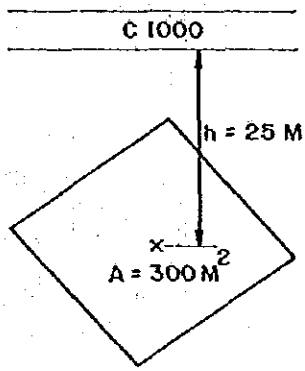
$= \frac{V'}{A} = \frac{504{,}833}{502} = 970.8 \fallingdotseq 971$ units

V = @ x A = 971 x 520 = 504,920 units

7. Standard article 17 (Island lot)

To calculate unit land value index of an island lot, street value (R) is multiplied by depth successive decrease ratio at the depth which is theoretically equivalent to the distance between the street and centroid of the lot and island decrease ratio which is stipulated in the standard article 18-(8).

Fig - 14



Unit land value index (@)

= street value (R)
x depth successive decrease ratio (u)
x island decrease ratio (n-island)

= R x u x (n-island)

= $1{,}000 \times \frac{83.6}{100} \times 0.9$

= 752.4 ≒ 752 units

Total land value index (V)

= @ x A = 752 x 300 = 225,600 units

When the shape of the lot is irregular, irregular shape decrease ratio (n-irregular shape) must be multiplied.

8. Standard article 20 (Lot including private streets and others)

Figure 15 shows an example of a lot whose part is used for street being attached street value.

The total and unit land value of the lot which is divided into street area and the other area shall be calculated following the standard 13-(2).

(I) Part of the lot corresponding to the land for street on the assumption that the street belongs to the streets stipulated in the standard 19-(2).

Land value index is calculated as follows :

The total land value of the (I) part of lot (street) (V'I)

= street value (R)
x 0.3 x the area of (I) part of lot

= R x 0.3 x A(I)

= 1,000 x 0.3 x 30 = 9,000 units

(II) Part of lot (The other part)

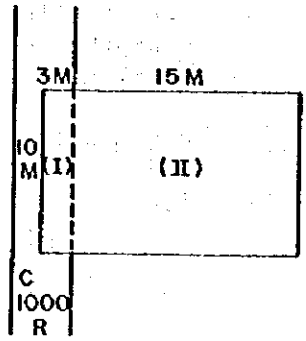
The total land value of the (II) part of lot (V′II)

= street value (R)
x depth successive decrease ratio (μ)
x area of (II) part of lot

Fig. – 15

= R x μ x A(II) part of lot

= 1,000 x $\frac{100}{100}$ x 150 = 150,000 units



Unit land value index (@)

= $\frac{V'(\text{I part}) + V'(\text{II part})}{A(\text{I part}) + A(\text{II part})}$

= $\frac{9,000 + 150,000}{180}$ = 883 units

Total land value index (V)

= @ x A = 883 x 180 = 158,940 units

9. Standard article 22 (Evaluation of block)

The block evaluation index is calculated as follows, and is used for estimating utilization increase ratio and compensation for decreased value of lot.

The block evaluation index

= A $\frac{\Sigma Rl}{\Sigma l}$ + ΣrBR

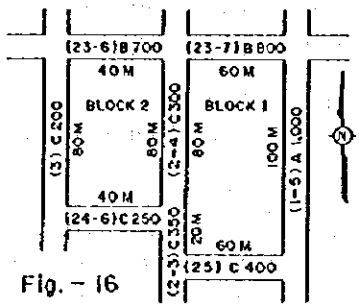


Fig. – 16

A $\frac{\Sigma Rl}{\Sigma l}$: approximate evaluation index based on the street values of front streets

A : area of the block

R : street value of streets enclosing the block

l : length of each side of the block

rBR : accumulated additional vantage index of 4 corner lots (side street)

r : length of side street frontage
when $\ell > 30m$ $r = 30 \times \frac{1}{2} = 15m$

when $\ell < 30m$ $r = 1 \times \frac{1}{2}$

B : Additional vantage ratio by side street
(Table 2-1, A = 1.5, B = 1.0, C,D = 0.5)

10. Standard article 28 (Document of land evaluation)

(1) Report on calculation of street value

In addition to the format 1-4 for calculation of street value, maps should be prepared indicating base data for calculations such as street section number before and after the development, condition of pavement of roadways, gradient, t value, facilities liable, value of m and s, systems of water supply and drainage and the like.

(2) Maps of street value index before and after the development

① Maps of street value index before the development shall be prepared on the basis of the existing topographic map at a scale of 1/1,000 or 1/500.

② Maps of street value index after the development shall be prepared on the basis of the design map at a scale of 1/1,000 of 1/500.

(3) Maps of unit land value index

① Map of unit land value index before the development

a. Street value index, unit land value index of entitled right and lots shall be recorded on the existing topography map at a scale of 1/1,000 or 1/500. Entitled right including several lots adjacent to one another shall be evaluated as one lot with the symbol ♂ and the number of leased lots shall be put on the right of lease.

b. Land or lot being used for public facilities shall be colored as follows:-

A. land owned by Government

i. Street, plaza etc. - brown
ii. River, canal etc. - green
iii. Other public facilities - yellow

B. Lots being used for public facilities

i. Lots with decrease ratio of less than 0.1 (Standard article 19) - brown
ii. Lots with decrease ratio of 0.3 - red

② Map of unit land value index after the development

Unit land value index is recorded on the design map or the finalized development map, at a scale of 1/1,000 or 1/500 in the same way as ①.

(4) Report on land evaluation

A report on the calculation of land evaluation should be prepared as follows:-

① The order of drawing up

The report shall be prepared in the order of the district, street and number of lot. Table 1 is used for land owners and Table 2 for other right holders.

② Drawing-up of report

One column of the table is used for one entitled right of lot.

In the case of anentitled right of lot before the development, which is thereafter re-plotted into several lots, one column is used for one entitled lot before the development and one column is used for one re-plotted lot after the development.

③ Guidelines for drawing up

i. The number of holders

A series of numbers are put on the holders

ii. The name of land holder and tenant

Record the names of land holder and tenant

iii. The number of leases held

a. When there is no right of lease, the mark " " is put into the blank.

b. When there is a right of lease, the lease numbers of are put into the blank. If some parts of the lot include own land, mark "own land" in the remarks column.

iv. Datum area, leased land area, re-plot area

In principle either datum area or leased land area, or finalized re-plot area shall be recorded.

v. Street value index

All the street value indices which are used for calculation of land value shall be recorded.

vi. Unit land value index

Unit land value indices which are calculated following the standard 12 shall be recorded.

vii. Total land value index

Total land value indices before the development which are calculated according to the standard article 12, and the total land value of re-plot which are calculated according to the standard article 11-(2) shall be recorded.

viii. The block number

The number of blocks into which lots are re-plotted shall be recorded.

ix. Mark of re-plot

Marks of re-plot shall be recorded.

x. Collection and payment of equity, contribution ratio
Index for collection and payment of equity, which is equivalent to the balance between the total land value index prior to and after the development shall be recorded. Contribution ratio shall also be calculated and recorded.

xi. Remarks

Special note on lots, for instance, island lot, private street and the like shall be recorded.

Table 1 Report on Land Evaluation

Number of Land Holder	Name of Land Holder	The Lot before the Development							Replot						Balance		Contribution		Remarks
		Name of District	Lot Number	Land Use	(Registered Area of Lot) Datum Area c	Street Value Index	Unit Land Value Index a	Total Land Value Index	Number of Block	Mark of Lot	Area of Replot d	Street Value Index	Unit Land Value Index b	Total Land Value Index	Collection	Payment	In terms of Land Value $1-\frac{a}{b}$	In terms of Land Area $1-\frac{a}{c}$	
					m^2						m^2				unit	unit			
Total																			

Table 2 Report on Land Evaluation

Number of Lease Holder	Name of Lease Holder	The Lot before the Development							Replot						Balance		Contribution		Remarks
		Name of District	Lot Number	Number of Lease Hold	Area of Leased Land	Street Value Index	Unit Land Value Index	Total Land Value Index	Number of Block	Mark of Lot	Area of Replot	Street Value Index	Unit Land Value Index	Total Land Value Index	Collection	Payment	In terms of Land Value $1-\frac{a}{b}$	In terms of Land Area $1-\frac{a}{c}$	
					m^2						m^2				unit	unit			
Total																			

Chapter 5

Re-plotting Design

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Re-plotting Design

5.1 Purposes

In re-plotting, the re-plot should correspond in principle to the original lot in terms of location, area, soil, water supply, land use, environment etc. The purpose of re-plotting design is to properly redistribute land to lots after the development on the basis of existing lots before the development.

Re-plotting design must follow the standard being established, stipulating corresponding re-plot, exceptions to principle of correspondence, and others in consideration of each particular project area. Document of re-plotting design must include calculation table of re-plotting design (table of comparison between original lot and re-plot) and re-plotting design map (original lots map and re-plotting design map).

5.2 Method of re-plotting design

5.2.1 Location of re-plot

It is a principle that lots should be located at or near their original places of them, which leads to compliance with the condition of correspondence.

Locational conditions of lots greatly affect their land value. So if the lot is located at its original place without any change in locational conditions, the land holder can more easily be persuaded to accept the re-plot.

Lots which should be re-plotted with special consideration of with their original locations are as follows:-

a. Lots under regulations or limitations enforced by ordinance.

- On distance and space
- On frontage and area
- On structure
- Regulation by zoning and building code
- Others

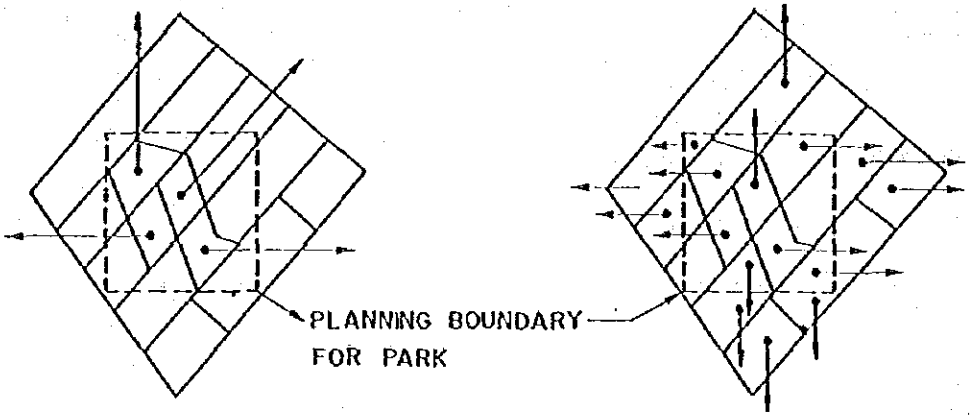
b. Lots of facilities difficult or improper to relocate.

- High rise building, large scale structure
- Old building
- Improper in terms of structure

Overlapping map of original lots map prior to the development and block design map after the development is used for re-plotting design to accommodate the original lots in and around the block into the block. In this process, location and shape of each re-plot are also presumed.

The difference between the total land value index of block and the summation of the standard land value index of each lot to be accommodated in the block, and contribution ratio should be balanced over every block. Flying re-plotting (re-plotting in a distant place) is inevitable for the original lots which happen to locate in land planned and designated for public facilities in the action plan.

Either method of "flying re-plotting" or "pushing re-plotting" shall be adopted for re-plotting of original lots which happen to exist in the planning area for parks, plazas, streets with wide right of way etc.



FLYING REPLOTTING PUSHING REPLOTTING

Considerations for flying re-plotting are as follows:-

1 The lots for flying re-plotting shall be designated at those places where the locational advantage is equivalent to or beyond that of the place, to which the lots would otherwise presumably be re-plotted.

2 The flying re-plot should be determined in consideration of such factors as differences in ground level, directional incline, land filling, distances from the facilities influencing land value of lot.

3 In the flying re-plotting of a plural number of lots, their flying directions should be a similar as possible and not cross with the re-plotting direction of lots where the flying re-plots are accommodated.

4 One unit of re-plot should be confined to covering only adjacent own land so that unreasonable concentration of re-plots in one specific place confusing the order of lots array, shall be avoided.

5 Many land owners would like to have their own lots merged into one spot. However, this could result in the construction of apartments in low density residential area.

6 The lots being located at 2 (two) or more spots can be aggregated into one re-plot only when the area of individual re-plot falls short of appropriate size of lot.

7 Lots adjacent to one another and owned by a single land holder shall be re-plotted into one spot.

8 One single policy should apply to both the flying re-plot the re-plot remaining at the original place.

5.2.2 Area of re-plot

Re-plots should be allotted in accordance with the estimated re-plot areas in the re-plotting calculation. The re-plot areas are generally calculated on the basis of such factors as location, original area and value of the lots. More specifically, in the re-plotting design, the area of re-plot should be determined in conformity with such conditions as appropriateness of lot size, measures for special lots, reserved land etc.

There are three major methods of re-plotting design through which re-plot areas can be estimated: Evaluation re-plotting calculation method, areal re-plotting design method and combined re-plotting calculation method.

In the evaluation re-plotting calculation method, the original lot and the re-plot are separately evaluated so that the equity comes as close to zero as possible in the re-plotting design. Therefore, when this method is adopted in the re-plotting design, there seems little problem of equity, but the contribution ratio may become unbalanced when the conditions of land use vary within the project area, or when there is considerable difference in lot price before and after the development.

The areal re-plotting design method is based on acreage. The re-plot area is determined on the basis of the original lot area, taking into consideration frontage and the width of street the lot faces. This method gives a fair contribution ratio in terms of acreage. However, the utility increase ratio may not necessarily be fair in the re-plotting design using this method.

The combined re-plotting calculation method combines the areal re-plotting design method and the evaluation re-plotting calculation method, taking both the utility increase ratio and contribution ratio into account. Although the re-plotting design using this method is complicated, it partially solves the problems of the previous two methods.

Adoption of one of the three methods outlined above depends on the conditions of the project area. It can safely be said that the areal re-plotting design method is most suitable to a hillside area where much of it is undeveloped, and the evaluation re-plotting calculation method is often selected for the re-plotting design in an already urbanized area.

a. Evaluation re-plotting calculation method

The economic gain created by the project is equivalent to the difference between the accumulated land value of all lots in the project site before and after the development.

This economic gain is to be distributed to all lots in proportion to their original land value before the development. To calculate the total land value of each re-plot after the development, the total land value of the original lot before the development is multiplied by the average land value increase ratio of the project site before and after the development. (Land value of each lot is to increase at the average land value increase ratio of all lots in the project site)

[Total land value of re-plot]	[Total land value of original lot]	[The average total land value increase ratio of project site]

$$Ei\ ei = Ai\ ai \times \frac{E \cdot eo}{A \cdot ao}$$

here $\frac{eo}{ao}$ = y (utility increase ratio)

$$\frac{E}{A} = \frac{A(1-d)}{A} = 1-d$$ (average contribution -n ratio)

$$Ei\ ei = Ai \cdot ai\ (1-d)\ y$$

(The area of re-plot)

$$Ei = \frac{Ai \cdot ai\ (1-d)\ y}{ei}$$

Before the development (original lot)		After the development (Re-plot)	
The accumulated total area of lots	--- A	The accumulated total area of re-plots	--- E
The total area of lot	--- Ai	The total are of lot	--- E
Unit land value of lot	--- ai	Average unit land value of lots in the block	--- ei
Average unit land value of original lots in the project site	--- ao	Average unit land value of re-plot in the project site	--- eo
		Average contribution ratio of the project site	--- d

A contribution ratio of re-plot --- di

In practice, the re-plotting design calculation is standardized as follows :-

$$(K) = \frac{(F)}{(B)}$$

$$Pi = Bi \quad (K)$$

$$Ei = \frac{Pi}{ei}$$

(B) = The accumulated total land value index of all original lots before the development
(F) = The accumulated total land value index of all re-plots after the development
(K) = Proportion ratio (= average total land value increase ratio of project site)
Pi = Standard re-plotting land value index
ei = Unit land value index of block in which the lot is re-plotted
Ei = The area of re-plot

The characteristics of this calculation method are summarized as follows:-

1 It is also possible to calculate the area of re-plot not being alloted at the location of the original lot.

2 The area of re-plot can be logically estimated based on land value of lot.

3 The area of re-plot and the amount of equity payment can simultaneously calculated.

b. Areal Re-plotting Design Method

In the areal re-plotting design method, re-plots are determined on the basis of areas and locations of sites before the project, using the principle of original location re-plotting and taking mainly the conditions of front roads into consideration. Evaluations carried out before and after the project are not used for re-plotting calculation : however, they are necessary in order to calculate the increase ratio and equity payment.

(1) Area of additional vantage

The utility value of a site may increase/decrease depending on whether the site faces a road, and how wide the road is. Therefore, part of the road which the site faces is added to the site area before the project as the area to be considered in re-plotting, and this additional area is usually set at one half of the road width. In cases where the road is particularly wide, or the site is located at a corner, a value

less than one half of the width of the road is often added, on the basis of a similar idea to that of frontage contribution.

(2) Contribution area for public facilities

The acreage of land contribution for public facilities is called "contribution for public facilities", which is divided further into "frontage contribution" and "communal contribution".

a) Frontage contribution

When a new road is created or an old one is widened, sites facing the road share the burden of contributing half of its width. This is based on the idea that the utility value of re-plots varies depending on the width of the roads they face. This contribution is called frontage contribution. If a road is a particularly wide one, the central part of the width is shared by all sites in the area, since not only the utility value of sites directly facing the wide road increases but so also does the utility value of all other sites in the area. As for the corner lot, it is responsible for one quarter of the road it faces on one side. Thus, the frontage contribution is determined by the length the site actually faces the road, and the width of the road it faces.

b) Communal contribution

Contribution areas for parts of roads which cannot be shared by the frontage contribution, parks and rivers are shared in proportion to areas to be considered in re-plotting. This is called "communal contribution".

c) Reserved land contribution

Reserved land contribution is to cover the cost for implementing the project, and in principle it is treated in the same way as communal contribution.

The above explanation may be expressed in the following formulas with symbols.

A ..... Total area of sites before the project
W ..... Total areas of additional road vantage before the project
Aw ..... Total area to be considered for re-plotting
Ka ..... Total area for public facilities before the project
dc ..... Communal contribution ratio
E ..... Total area of re-plots after the project
B ..... Total area of frontage contribution
C ..... Area of communal contribution for public facilities
Ke ..... Total area for public facilities after the project
G ..... Reserved land area

a. Cases where there is no reserved land

$$Aw = A + W$$

$$A = Aw - W \quad \ldots\ldots\ldots\ldots (1)$$

$$E = A - (Ke - Ka) \quad \ldots\ldots\ldots\ldots (2)$$

Therefore, the area for communal contribution for public facilities, C, is:

$$C = (Kd - B) - (Ka - W) = (Ke - Ka) - (B - W) \quad \ldots\ldots\ldots (3)$$

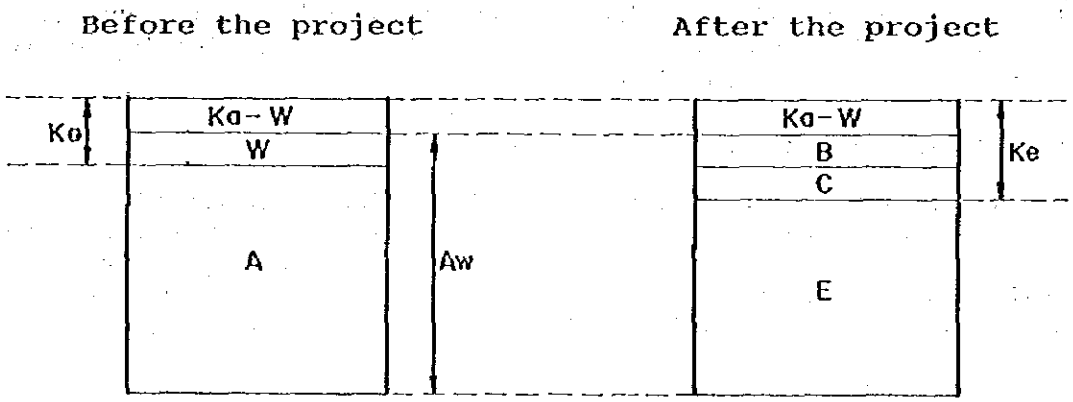
When expressions (1) and (3) are substituted into (2) :

$$E = Aw - B - C \quad \ldots\ldots\ldots\ldots (4)$$

And the communal contribution ratio, dc, for the area to be considered in re-plotting is :

$$dc = \frac{c}{Aw} = \frac{Aw - B - E}{Aw} = 1 - \frac{B + B}{Aw}$$

The above relations may be expressed in the following drawings:



b. Cases where reserved land is created

Expressions (2), (4) and (5) are :

$$E = A - (Ke - Ka) - G$$

$$E = Aw - B - C - G$$

$$dc = \frac{C + G}{Aw}$$

The areal re-plotting design method has the following characteristics :

(1) The calculation is relatively easy.
(2) If there is a large discrepancy in land values, frontage contribution may be unfair, even when the width of the road is the same.
(3) In districts where land values differ to a greater extent, the communal contribution may be unfair.
(4) It is suitable for areas with relatively high site utility increase ratio, such as a newly urbanizing area.

c. Combined Re-plotting Calculation Method

The combined re-plotting calculation method attempts to realize advantages of the above two methods, whilst easing the disadvantages as much as possible. This method may be divided into two methods: the one where the areal method plays the main role with additional features from the evaluation method, and the one in which the evaluation method plays the major role with additional features from the areal method.

5.3 Standard for re-plotting design

With regard to the land use of a lot, it is supposed that re-plotting is designed to facilitate utilization of one lot with one building on it. For this utilization of lot, shape, size, topography, soil, drainage, etc. are of considerable importance. Therefore in re-plotting design the following standards should be established:-

5.3.1 Location of re-plot

It is most desirable to choose a re-plot in the original location of the lot prior to development. However it may become necessary to locate the re-plot away from the original location (called flying re-plot) when the original land is allotted for a public facility, or when special arrangements for sub-standard lots in terms of size must be made.

5.3.2 Arrangement of re-plot

Re-plots should be alloted in two rows along the longer sides of the rectangular shaped block. Locational order of original lots have to be given great consideration in the arrangement of re-plots.

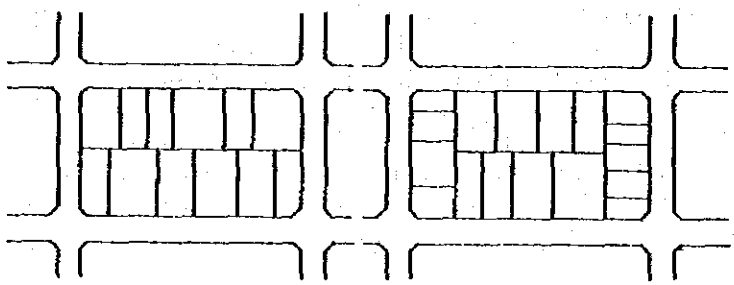
5.3.3 Area of re-plot

Re-plots should be allotted in accordance with the estimated re-plot area in the re-plotting calculation so that the least equity is obtainable. However, efforts should be extended in order that the contribution ratios of different lots remain fairly even at the average contribution ratio of the total project area. The maximum contribution ratio may be limited to about 1.2-1.5 times the average contribution ratio. It may be necessary to take into special consideration that the utility of excessively small lots or already-standing buildings is not damaged as a result of the re-plotting design.

5.3.4 Shape and boundary of lot

Re-plots should generally be in rectangular shapes. The width of a re-plot is determined by the back yard boundary of the block in which the re-plot is located. It is generally held that the optimal depth of a re-plot is about one and a half times that of its frontage, which is supposed to be no less than 5 m.

Lot boundaries should meet at right angles or as close as possible to right angles to the street. The back yard boundaries of lots should be parallel to the longer sides of the rectangular shaped block, and be as straight as possible.



5.3.5 Combination of re-plots

The following combinations of original lots and re-plots are possible :-

a. One re-plot for one original lot.
b. One re-plot for two or more original lots (referred to as an annexation re-plot).
c. Two or more re-plots for one original lot (referred to as divided re-plots).

In principle, combination (a) is most desirable. It is not advisable to allow two or more re-plots for two or more original lots.

5.4 First lines of re-plotting design

Re-plot should be designed based on the principle of correspondence with a view to establishing a fairly even contribution ratio (being close to average ratio) over all the lots in terms of area of lot, and least equity in terms of value of lot.

- A re-plotting calculation method which is viewed most suitable for the real conditions of the project site should be selected and detailed standards for the implementation by that method should be established.
- Entitled lots and rights should be determined.
- Lots being kept aside for special arrangements along with their conditions should be determined.
- Standards of re-plotting design for general lots should be established.
- In the case of adjustments for sub-standard lots in terms of size, and lease hold, the standards for their implementation should be established.
- In the case of multi-level re-plotting (re-plotting on building floor), standards should be established.
- In the case of taking measures for special lots, detailed guidelines for their implementation should be established.
- In the case of setting up reserve land requisite items for implementation such as its location, area and etc. should be determined.
- Standards and procedures of land evaluation should be established.
- Necessary measures for handling matters such as calculation of shares of divided lots in relation to transference of rights after finalization of re-plotting shall be stipulated in detail.
- Stipulations on any peculiarity in the project to be taken into consideration should be made and established, if necessary.

5.5 Re-plotting Design

5.5.1 Basic data for re-plotting design

a. Identification of lots for special arrangements

. Lots to be purchased in order to mitigate contribution ratio.

. Original lots for which re-plots will not be allotted at the request of or on agreement with land holders (law article 90).

. Lots, if any, which need special arrangement must be identified as follows :-

1. Lots and leased lots whose sizes and area should be adjusted in re-plotting design and the minumun size of lot, which could be a standard for the lot adjustment. (Law article 91, 92, 57).

2. Lots to which no re-plot shall be alloted just with equity payment.

3. Lots to which either additional or reduced re-plot shall be alloted.

4. Large scale lots which shall need specialized contribution ratio for appropriate size of lot.

. Lots being used for public services, which need special arrangements stipulated in the law article 95.

. Reserve land with its area and total prices when there are specific plans to use the reserve land.

The area and location shall be arranged in response to the purpose.

b. Calculation of average contribution ratio

Average contribution ratio of the project site is calculated as follows:-

$$D = \frac{A - E}{A} = 1 - \frac{E}{A}$$

Total accumulated area of original lots in the project site prior to development -------- A

Total accumulated area of re-plots in the project site after the development -------- E

Average contribution ratio of the project site -------- D

In the case of reserved land and creative re-plotting, the average contribution ratio should be calculated with the area corresponding to them being subtracted from the total accumulated area of the original