

APARTMENT COMPLEX

/
SURH

AN APARTMENT COMPLEX

BY

Benedict D. Surh

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Preliminary Research
on
An Apartment Complex
for
Seoul, Korea

by
Benedict D. Surh

Arch 490 - Thesis
School of Architecture
Montana State College
Bozeman, Montana
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conditions
creating
a need

CONDITIONS CREATING A NEED FOR THE PROJECT

During the nineteenth century the world underwent a period of invention and advancement that has come to be called the Industrial Revolution. This advancement heralded the greatest rural to urban population movement in history. With the advent of the factory, necessary articles no longer had to be made at home. Rather, people began to move to the cities where three-quarters of all industrial work was obtained and one-third of the work in other fields was available. People who were interested in educational, cultural, and governmental advantages also congregated in the major cities. As these cities began to grow, the need of housing programs became evident. Schools had to be built, stores and transportation systems had to be provided, and most of all, houses had to be built to take care of the rapidly increasing city populations. This movement was taking place in the early twentieth century in Korea.

In the 1940's, when the cities were growing rapidly, such agencies as the Governmental Housing Administration and other financing companies were set up to encourage private builders. These measures, taken to cope with the housing problem, seemed to have had little effect

upon the alarming rate at which the housing problem was becoming critical. At the end of the Korean War, when thousands of service personnel returned to the already crowded cities, slums became so prevalent that the government was forced to take positive action. In 1955, a housing act was passed.

As this plan was carried out, one problem came to the fore; this was cost. The people who had lived in the slum areas were of the lowest income class, and most of them were supported by foreign aid through the government. However, neither middle nor higher income classes, who lost their houses in the war, could afford the cost of architectural and construction services. As the result of this high cost, some 10,000 families were forced to rent rather than purchase houses.

The 1960 census survey¹ of the desires of war veterans showed that an overwhelming majority wished to rent quarters rather than purchase them. Probably the reason for this trend toward rental units may be found in the increasing living costs, higher taxes, and changing patterns of living brought about by the influence of present day civilization.

¹A letter to Mr. Paul W. Surh, Seoul, Korea

local
conditions

LOCAL CONDITIONS

Geographical

Seoul, the cultural center of Korea and also its capital since A.D. 1392, is located almost midway between the northern and the southern extremities of the country, about six miles from the west coast. More exactly Seoul has a latitude of $37^{\circ} 6'$ and a longitude of $127^{\circ} 3'$ and an elevation of 358 feet above sea level.

Climate

The climate of Korea is generally pleasant all year around. In fact, Korea has one of the most healthful climates in the world. The intersection of continental and oceanic winds produces a climate that varies considerably in different parts of the country, although it never becomes uncomfortable.

In the summer the heat is tempered by sea breezes, and in the winter the cold is tempered by a dry, crisp atmosphere with very little snow. Winter skies are almost always blue and bright, producing a mean January temperature of 23.2 degrees in fahrenheit.

Annual precipitation averages 36 inches, with 80 to 90 percent of the rainfall occurring during the seven

farming months. (April through October.) In some years the summers are very dry, but in the fall it is possible to have 14 inches of rain during a single day.

Annual Mean Temperature is 63.5°F

Month	Temperature (F°)
Jan.	23.2
Feb.	28.58
Mar.	38.48
Apr.	50.9
May	61.34
June	69.44
July	79.7
Aug.	77.72
Sept.	68.54
Oct.	54.92
Nov.	43.34
Dec.	29.84

site

conditions

SITE CONDITIONS

Orientation

Within the city itself rises Mountain Nam, and at the northwest edge of this mountain there is an available site for an apartment building.

In choosing a site for this project I have considered the following facts:

1. Neighborhood conditions are of a second class residential house.
2. Easy access by all types of transportation.
3. Neighborhood facilities are convenient.
 - a. Walking distance to commercial center and shopping center.
 - b. Walking distance to schools.
 - c. Walking distance to recreation.
 - d. Walking distance to churches.
 - e. Availability of hospitals and clinics.
 - f. Availability of city services such as police and fire protection, street cleaning, and garbage disposal.
4. Parking spaces are available on site and off site. Because very few people own private cars, the parking problem is not

critical. However, enough landscaped grass area should be provided which could be developed into parking area for the future development.

5. Utility lines are available such as sanitary and storm sewers, water, gas, electricity and telephone lines.
6. Pleasant view from building site.

The best site for housing is not completely level land, although it may be the cheapest to develop. Our thinking is handicapped by our heritage of easy walking on the valley floor. The flat valley floor is for farming, industry, and commerce. The hills or sites along water courses provide ideal conditions such as plentiful light and air and aesthetically pleasing views.²

The site is approximately 6,000 square meters and satisfies the above considerations.

Topography

The major portion of the site has between 5 to 9 percent slope down toward north. The southeast border rises into Mt. Nam. Illustration indicates the topographic character and some of the other natural features of the site.

²Apartments and Dormitories, An Architectural Record Book, FW Dodge Corp., 1958, p. 19

Vegetation and other Natural Features

Most of the vegetation on the site consists of pine trees between 5 to 15 inches in diameter. There are also many shrubs and bushes, most of which will require removal to allow the best use of the site. Because of the scarcity of the trees, bushes, and shrubs in this area, all vegetation will be transplanted if they are in the way. There is no city regulation as to cutting trees on a building site.

Since the site is sloping, there is no standing water; but there is a small creek at the north portion of the site. (See site.)

Adjacent Environment

Next to the site to the southeast on top of Mt. Nam is a temple. Surrounding the site on the north, west, and east is a second class residential district. To the southwest and south is an industrial district.

Immediate and Distant Views

The view in the immediate vicinity of the proposed site is surrounded by one- and two-story middle class residential houses. The distant view overlooks the heart of Seoul. The more distant view is Samkak mountain (2,250 feet above sea level) directly to the northwest and a residential district on the hill of Mt. Buk.

Zoning Regulations

The 1961 building codes and the 1961 building ordinances of Seoul city will be used as criteria for any safety or building requirements. There are no regulations concerning earthquakes or the height of buildings.

Utilities

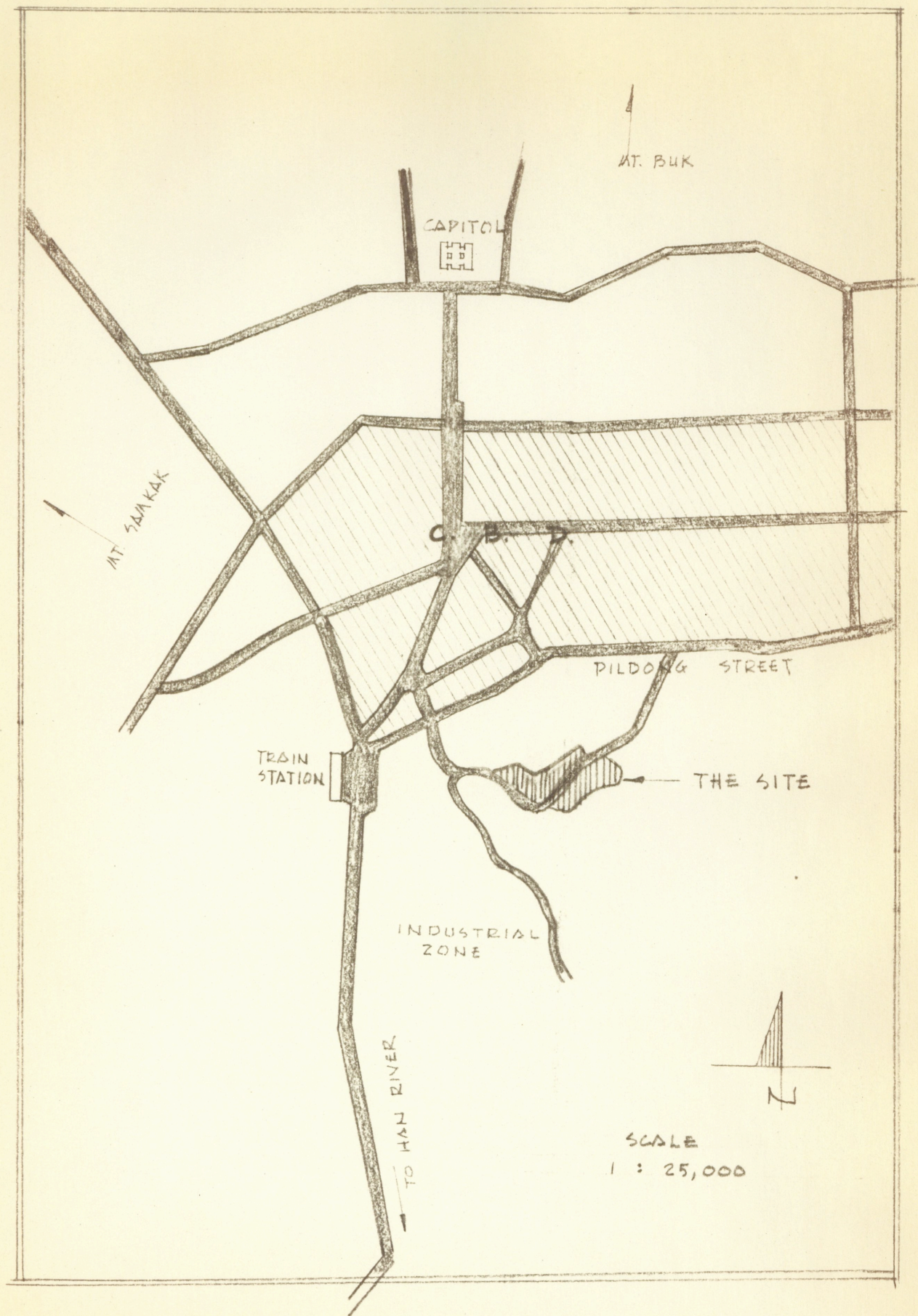
All utilities are available at this site. Transportation facilities, such as bus and street-car, pass through Pildong street, approximately 500 feet from the site.

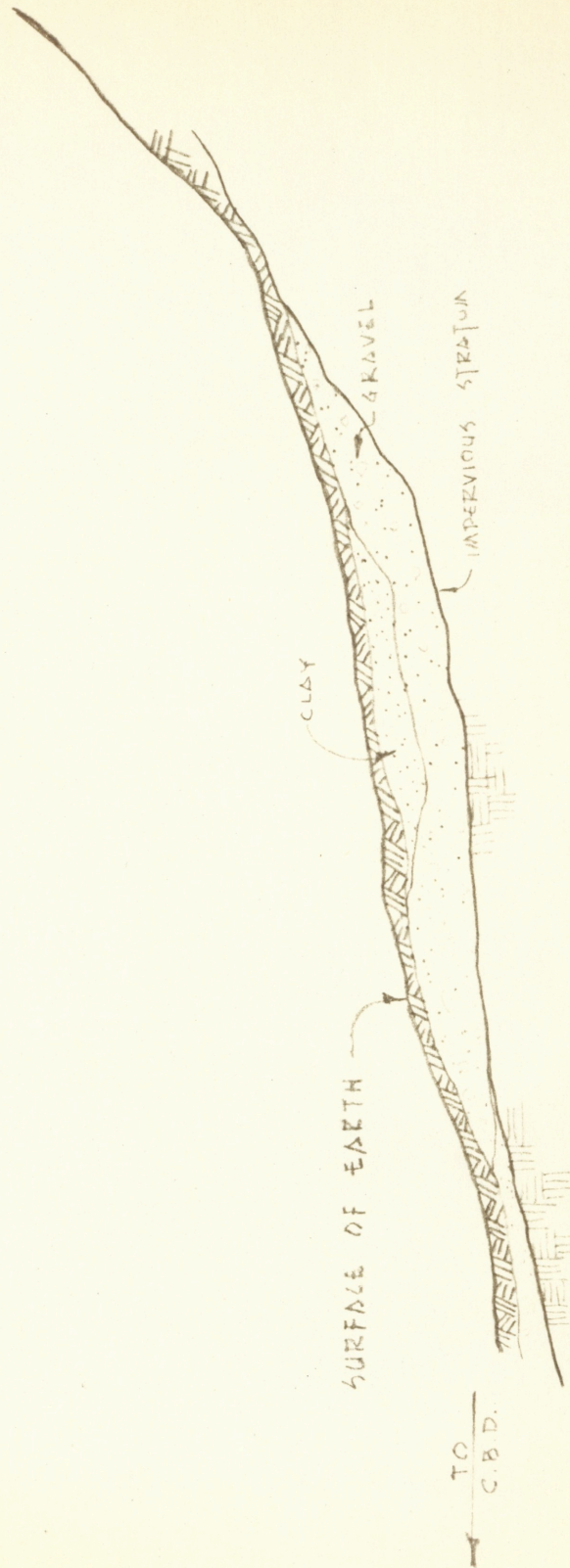
Soil Analysis

From past excavation experience in this area, it is known that 10 to 15 feet of clay cover an unknown depth of gravel base. Clay is a very difficult soil to build on; as the water level in the soil varies, the allowable soil pressure changes. This change varies between 500 to 2,000 pounds per square foot. This variable requires special foundation considerations to maintain a constant load bearing capacity. A floating foundation can best be used to overcome the problems involved. This foundation principle provides a very large area in bearing on the clay and produces a constant bearing capacity value with little dependence on the water level. To get this large area, a concrete slab is used. The thickness of this slab usually ranges from two to five feet depending largely upon the height and area of the base of the building.

Wind Conditions

Prevailing winds for the site are generally from the northwest. Storm winds are from the west, and as a rule wind conditions are seldom severe during the rainy season.





PROFILE FOR THE SITE

NO SCALE



FROM PILDONG ST. TOWARD THE SITE



VIEW TOWARD NORTH-EAST



VIEW TOWARD EAST



VIEW TOWARD SOUTH-WEST



VIEW TOWARD SOUTH



VIEW TOWARD NORTH



BIRD'S VIEW OF THE SITE .

function
of the
building

FUNCTION OF THE BUILDING

To the owner, an apartment building is primarily a means of making money, either through sales or investments. To the occupants of an apartment, it is a home. The architect who designs an apartment of this type must satisfy these two functions.

Buildings crowded into small crooked lots or forced into odd shapes in an attempt to squeeze in the last possible room may show a high return on paper; but, except during periods of extreme housing shortages, such units generally are avoided by prospective renters.

The occupants, if they are of upper or middle classes, are looking for privacy, spaciousness, and cleanliness. Also, a great variety of units must be provided to accommodate large or small families and high or low income families in the design of such an apartment complex.

The different variations to be provided are:

0 or 1 bedroom	For a young married couple
2 bedrooms	For a couple with 1 or 2 children
3 bedrooms	For a couple with 3 or 4 children or a couple with their parents and 1 or 2 children

4 bedrooms

For a couple with their
parents and over 3 or 4
children

Because of tradition many Korean families consist of three generations; therefore, I have provided four-bedroom units for parents, boys, girls, and grandparents.

Apartment units should be designed to provide complete living facilities (see page 30) for the type of tenant for whom they are intended. Consideration should be given to providing proper space, circulation, and equipment for all the manifold activities of family life.

Generally speaking, a young couple with children under two years and elderly couples without children can do well with a minimum of outdoor space. This outdoor space could be provided by a balcony which would eliminate yard upkeep like mowing lawns, trimming hedges, etc. On the other hand, families with school age children should have access to a larger outdoor area for children's play.

The housing unit must serve such functions as sleeping, eating, lounging, bathing, storing of clothing and equipment, and entertaining guests. The unit should also be provided with garbage storage and disposal. Laundry rooms should also be provided, equipped with either public or individual facilities.

Living Room

The center of living area is the living room. Most of the tenants' leisure indoor activities such as visiting, relaxing, entertaining, etc., take place in this area. This room should be designed to create a pleasant, comfortable and restful atmosphere.

Kitchen and Dining

This room is used not only for food preparation but also for eating, ironing, sewing, and frequently in the evenings as a place to read or relax. Laundry equipment may be placed in this area.

The Master Bedroom

This room is used for sleeping purposes and dressing. The room should contain storage closets for clothes. A bed lamp and table should also be provided.

Additional Bedrooms

This room is used for sleeping purposes and dressing. The room should contain storage closets for clothes.

Bath

This room is for personal hygiene. The room should contain storage closets for linens and medicine.

Mechanical room

This room is to contain heating equipment for one or several units. In the latter case, this room should be

located centrally. The forced air heating system seems most appropriate for this project.

Sidewalk

The function is for interconnecting units, play areas, and traffic. This sidewalk should be of concrete slab.

Play Yard

This area is for children's play ground. The area should be directly accessible from the units. A sandbox and children's play equipment should be provided in this area.

aesthetics

AESTHETIC CONSIDERATIONS

The aesthetic qualities to be expressed in a building vary greatly and depend upon both the type of the building and the designer's beliefs and concepts.

The most important factors in architectural design are:

1. Function of the building
2. Principles of beauty
3. Relationship of building to site and its environment.

Any one of these factors is extremely important in design. However, I, personally, believe that the proper function of a building is of prime importance.

This apartment building is to be a home for the tenants. For this reason I feel that there should be a blending of warmth, friendliness, contentment, and happiness. An inviting atmosphere should be experienced by the visitors. To obtain these feelings, the building should be airy, well lighted, and mechanically well-equipped for comfort in any season.

The principles of aesthetics such as beauty should be employed in the architectural as well as the structural expressions in order that the desired character can be

obtained. The means of obtaining this character is by the proper combination of materials, textures, colors, lights, forms, shapes, and structural systems.

This apartment building may be used by people with different backgrounds. For this reason, there should be a great variety in the combination of the apartment units. Lower rent units, for instance, must emphasize a feeling of cheerfulness, happiness, and gaiety with economical materials. For the higher rent units, on the other hand, the emphasis should be on warmth and dignity by a greater combination and variety of materials, textures, values, and forms.

Aesthetics not only applies to the building but also to its site. The building's form, shape, and massing should relate to its immediate environment, to the greater community, and, in turn, be a part of the whole city plan.

economics

ECONOMIC CONSIDERATIONS

General

The final design of this building has not yet been decided upon, so the construction methods and materials are also indefinite; therefore, it is difficult to make a valid cost estimate. Another more variable factor in this cost estimate is the unstable economic situation in Korea. The methods of estimating used by Marshall's Valuation Service in the United States do not relate directly to foreign countries, because of labor and material cost differences.

Regardless of the estimated cost, the actual cost of the building can be reduced by good planning. The architect must use a combination of design, material, and assembly methods in achieving an economical solution. Economical design must:

1. Eliminate wasteful building shape.
2. Eliminate ornamental features.
3. Eliminate superfluous space to achieve compactness.
4. Have planned rooms so that they may be used for several purposes.
5. Eliminate unnecessary dead load.

6. Be planned for proper design of mechanical installations. (heating, electricity, plumbing.)

Economical material must:

1. Reduce dead load by use of lighter material.
2. Reduce maintenance cost by use of durable material.

Economical assembly method must:

1. Be simple.
2. Be easily erected.

Maintenance Cost

In order to keep the maintenance cost at a minimum, durable, easily cleaned, and long lasting materials should be used.

Rental return

Rental rates vary greatly in different parts of the city. I believe, because of the many conveniences of this site, the renting rates will be higher than in most of the present apartment buildings. However, the basic rates will be calculated from the following formula prepared by the Community Facilities Administration of the Housing and Home Finance Agency.

$$X = \frac{(i) (a) + (b)}{0.90}$$

where:

- X = the annual rental charge per unit
- a = the annual cost of the construction loan per unit
- b = the annual operating cost per unit
- i = a factor which represents debt coverage
- .90 = an annual vacancy loss of 10 percent

planning
the building

PLANNING THE APARTMENT

General

In planning an apartment building, the important factors to be considered are: site plan, materials, lighting, heating, maintenance, circulation patterns, and parking.

Orientation of buildings on the site in relation to sunlight is more important than orientation with respect to prevailing breezes. Rooms which face from 25 degrees east of south to 25 degrees west of south in the Seoul area will receive the maximum sun in the winter and minimum in the summer. (See illustration.) Advantage should be taken of any possible views, and the relation of the various buildings to each other should take this factor into account. Lack of care in the placement of one building may block the view of several others, and a good view is a matter of extreme importance especially in apartment buildings. Where possible, buildings should be staggered to take advantage of views.

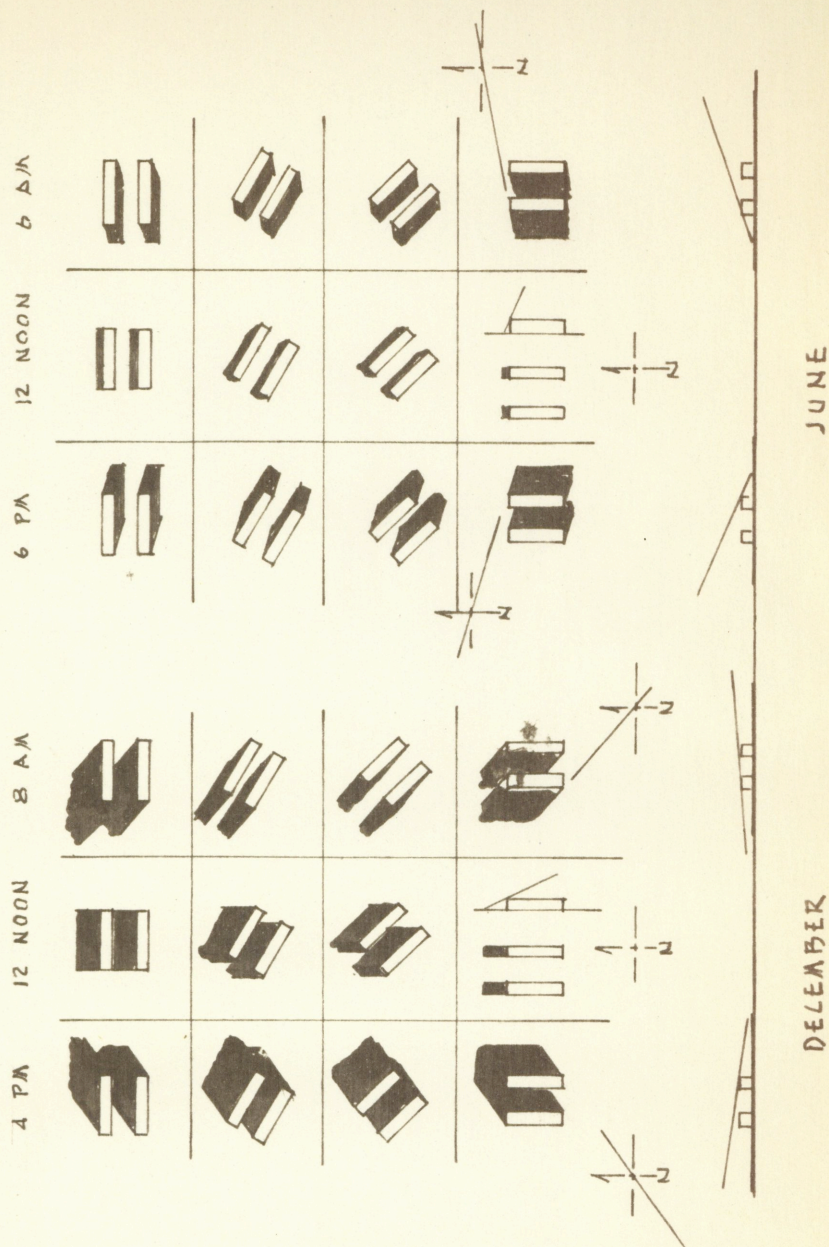
Consideration must be given to achieve maximum privacy. Privacy can be achieved by correct placement of the building in relation to noise arising from the play area and from the traffic areas.

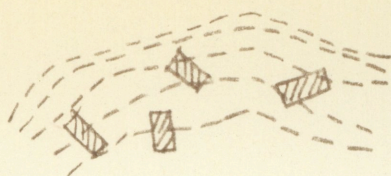
Landscaping contributes a great deal to the building and must be carefully laid out to enhance the appearance of buildings and grounds. Planting should be designed to enhance the architecture, its massing, texture, and colors.

Heavy planting should be used for screening along heavy traffic ways and around play areas to prevent noises from disturbing occupants of the building.

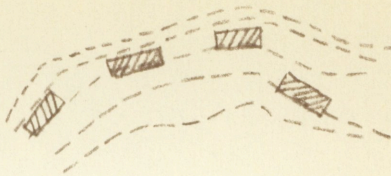
Locating the project entrances close to mass transportation and neighborhood facilities must be considered, and they should be located as conveniently as possible. The number of entrances to the project should be kept at a minimum, and whenever possible interior streets should be arranged so as to give maximum protection from traffic, noise, and fumes.

SUN ANGLE



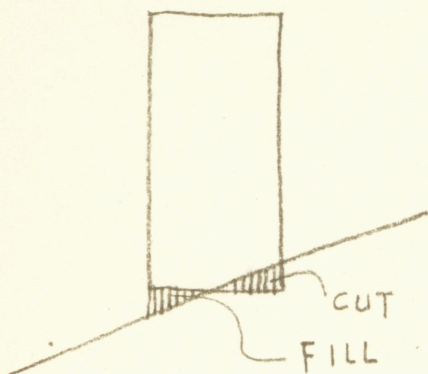


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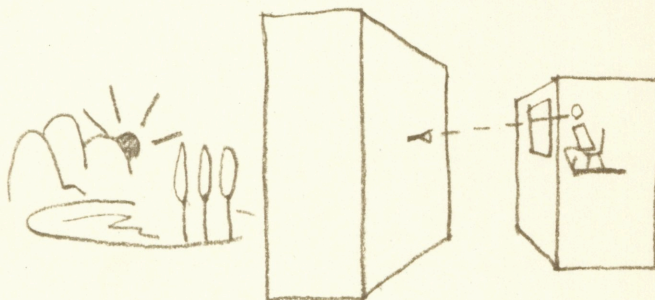


BETTER

TAKING ADVANTAGE
IN VIEW



MIN. EXCAVATION



BUILDING BLOCKING VIEW

building
program

BUILDING PROGRAM

General

In the 1960 census survey taken in Seoul, Korea, the following conditions have been found to exist:

30% of the families need 3 bedrooms

25% of the families need 2 bedrooms

20% of the families need 1 bedroom

15% of the families need 4 bedrooms

10% of the families need 0 bedrooms

For these reasons I have decided to use these same proportions in planning this project.

ROOMS		BEDROOMS IN SQ. FT.				
		0	1	2	3	4
<u>Livingroom</u>		160	160	160	180	180
Function	Use of leisure indoor hours					
Equipment	Sofa, couch, tea table					
Finish	Durable material, warm relaxing color					
<u>Dining-kitchen</u>		120	120	120	130	130
Function	Eating, cooking, storage of food					
Equipment	Counter, stove, ref., dining table and chairs					
Finish	Durable, easy maintenance material					
<u>Master bedroom</u>		-	120	120	120	120
Function	Sleeping and dressing					
Equipment	Bed, dressing table					
Finish	Warm, relaxing color					
<u>Additional bedrooms</u>		-	-	90	90	90
Function	Sleeping and dressing					
Equipment	Bed, table and chair					
Finish	Warm relaxing color					
<u>Bath</u>		40	40	40	50	50
Function	Personal hygiene					
Equipment	Tub, wc, lav., storage					
Finish	Durable, easily cleaned material					

one bath satisfactory?

ROOMS		BEDROOMS IN SQ. FT.				
		0	1	2	3	4
<u>Storage</u>						
Linen		3	3	3	4	4
Broom		3	3	3	3	3
Coat		6	6	6	8	8
Clothing		6	6	6	8	8
<u>Mechanical room</u>		25	25	30	35	40
Function	House heat and hot water					
Equipment	Unit heater, hot water tank					
Finish	Rough					
<u>Rental manager's office</u> (adjacent to manager's apt.)						220
Function	House manager and secretary					
Equipment	2 desks and chairs, 2 or 3 reception chairs, counter and cabinet					
Finish	Durable and easily cleaned material, pleasant atmosphere					
<u>Warehouse</u> (maintenance shop)						600
Function	Storage for furniture, equipment and repair					
Equipment	Work bench, tool storage					

ROOMS

Warehouse (cont.)

Finish Rough

Durable, resistant to
oil, paint, and abrasion

Parking

(landscaped for future development) 160 (8x20) per car
Function To provide parking space
Minimum 1 car per unit
Maximum $1\frac{1}{2}$ car per unit

Garbage can rack

Function To contain all garbage cans
Minimum 1 can per unit
Maximum $1\frac{1}{2}$ can per unit

Clothesline

Function To provide cloth hanging
space other than dryer
Minimum 1 line per unit
Maximum 3 lines per unit

Play area

Function To provide a play area
for children
Equipment Swing, sandbox
Relation Close to units

Area ref?

Total square feet in each unit will be as follows:

BEDROOMS

TOTAL SQ. FOOTAGE

0	363 sq. ft.
1	483 sq. ft.
2	578 sq. ft.
3	698 sq. ft.
4	813 sq. ft.

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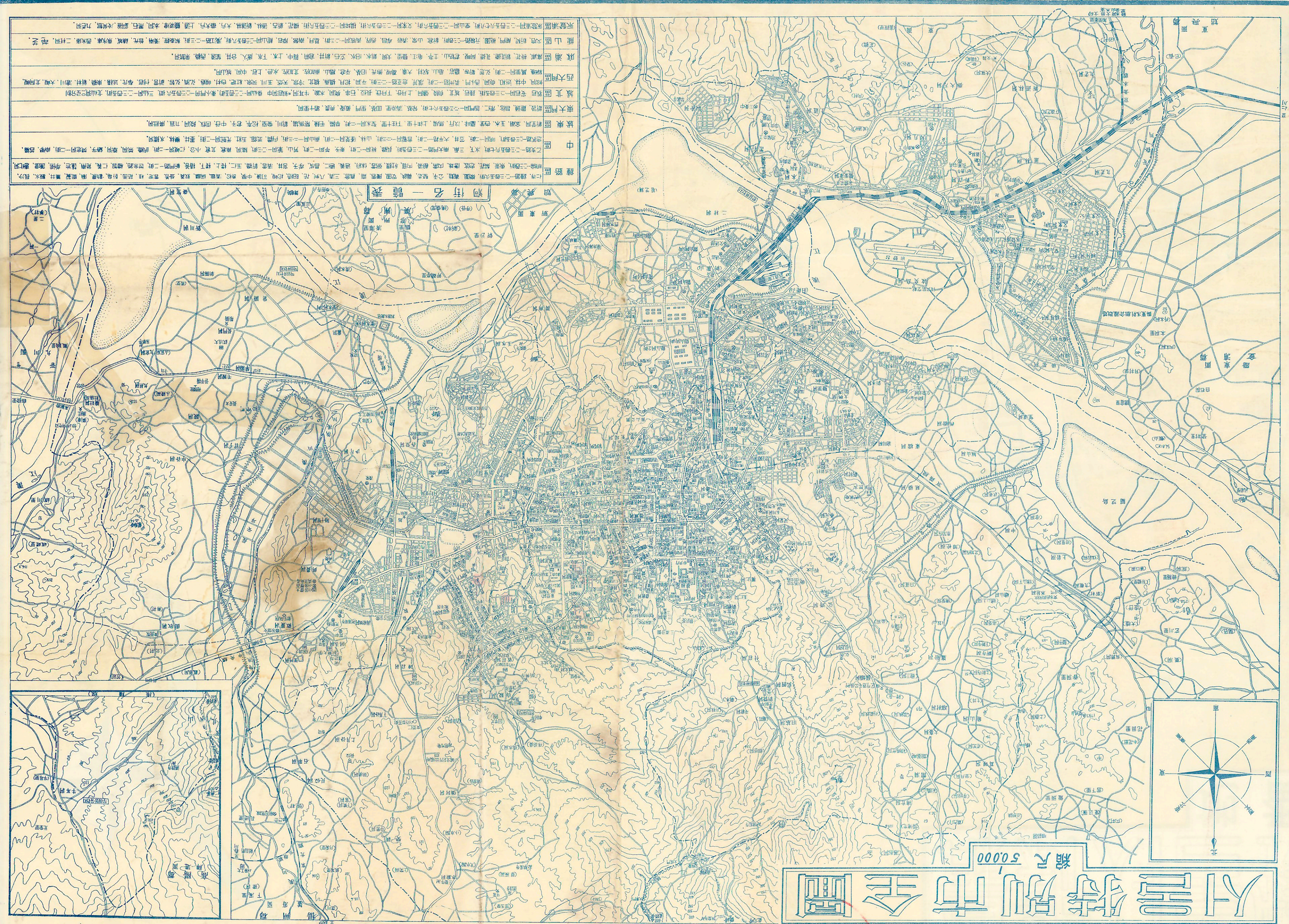
永登浦區地圖

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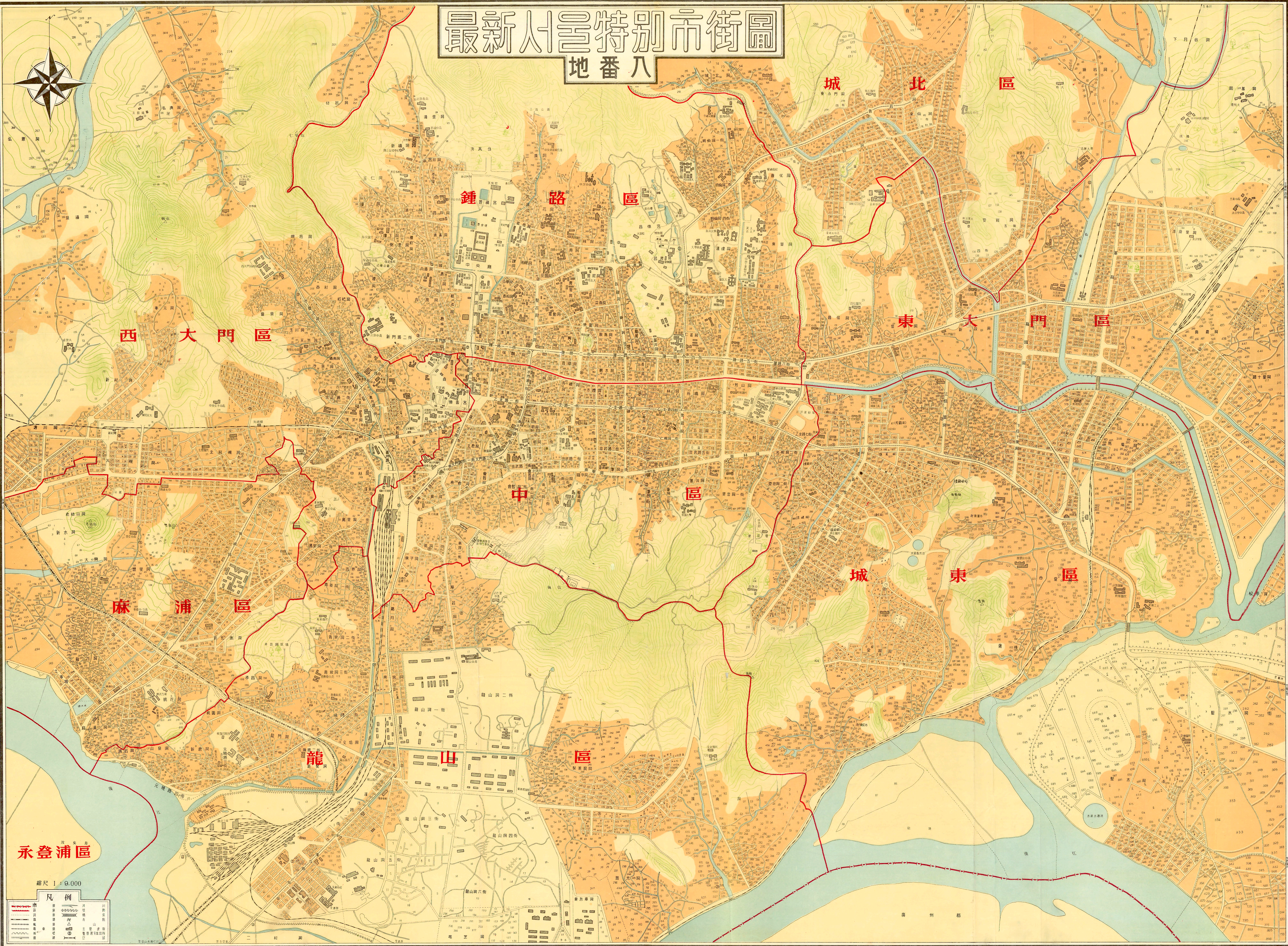


永登浦特別市全圖

縮尺 5,000



最新八邑特別市街圖



永登浦區

縮尺 1 : 9.000

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