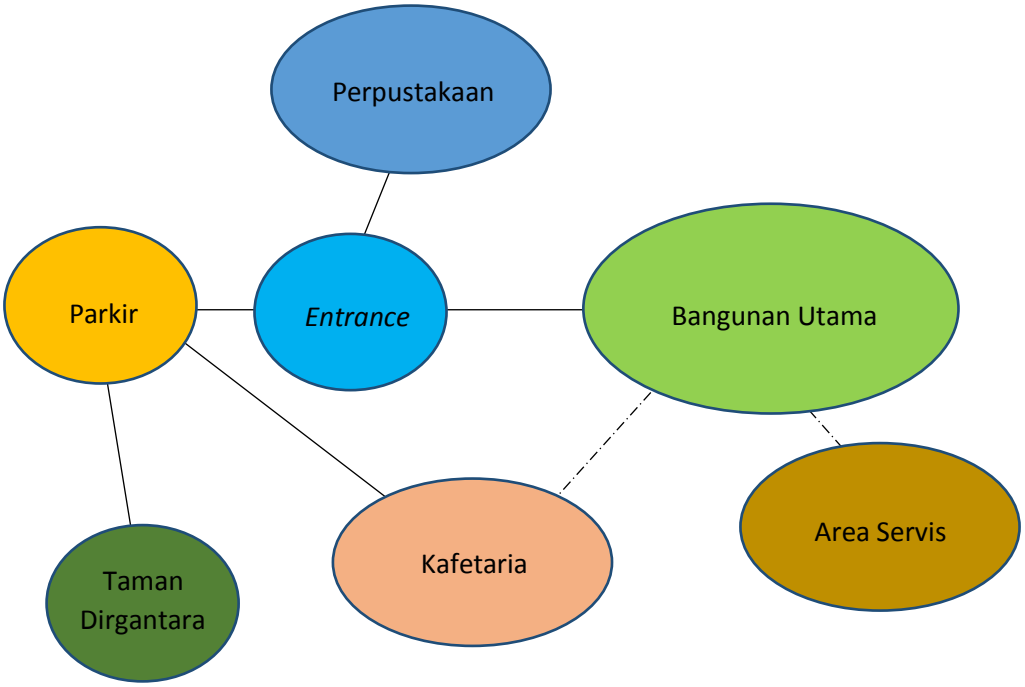
BAB IV
ANALISIS

4.1 Analisis Fungsional

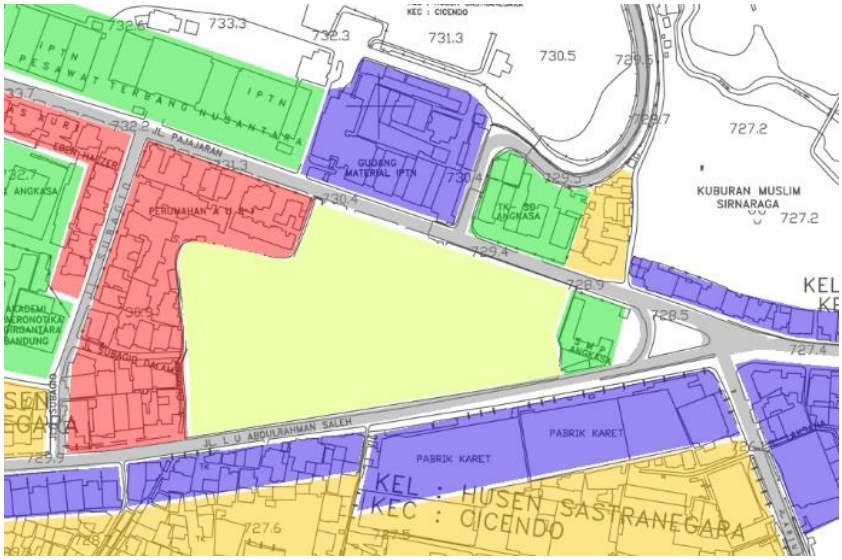
a. Organisasi Ruang



Tabel 5. Organisasi Ruang
(Sumber : Dok. Pribadi)

Keterkaitan dan hubungan ruang-ruang pada lahan perancangan museum dirgantara dapat dilihat pada skema diatas, ada 7 point yang saling terhubung satu dengan yang lainnya. Skema menunjukkan bahwa bangunan utama, perpustakaan, dan kafetaria tidak saling terhubung secara langsung, melainkan dihubungkan melalui *entrance.* Kafetaria dan juga Taman Dirgantara bisa diakses langsung dari area parkir tanpa harus melalui *entrance.*

b. Pemintakatan



Gambar 16. Pemintakatan
(Sumber : Dok. Pribadi)

Keterangan :

- : Zona Bangunan Utama
- : Zona Industri, jasa, dan retail
- : Zona Perumahan Dinas TNI AU
- : Zona Pendidikan
- : Zona Permukiman

Dalam skala makro pembagian zona daerah sekitar lokasi perancangan adalah sebagai berikut :

1. Zona Bangunan Utama, merupakan zona dimana bangunan museum dirgantara berdiri.
2. Zona Industri, jasa, dan retail, merupakan bangunan yang berada disekitar zona bangunan utama yang memiliki fungsi industri dan usaha.

3. Zona Perumaha Dinas TNI AU, merupakan area dimana digunakan sebagai perumahan khusus TNI AU. Zona ini tidak bisa dipindahkan oleh karena masuk ke dalam kawasan TNI AU.

4. Zona Pendidikan, bangunan yang berdiri di sekitar bangunan dengan fungsi sekolah dari mulai TK, SD, SMP, SMA, dan juga Universitas Nurtanio (sekolah penerbangan).
5. Zona Permukiman, merupakan daerah permukiman penduduk yang berada di sekitar zona bangunan utama.

c. Pemintakatan Site :



Gambar 17. Pemintakatan SIte
(Sumber : Dok. Pribadi)

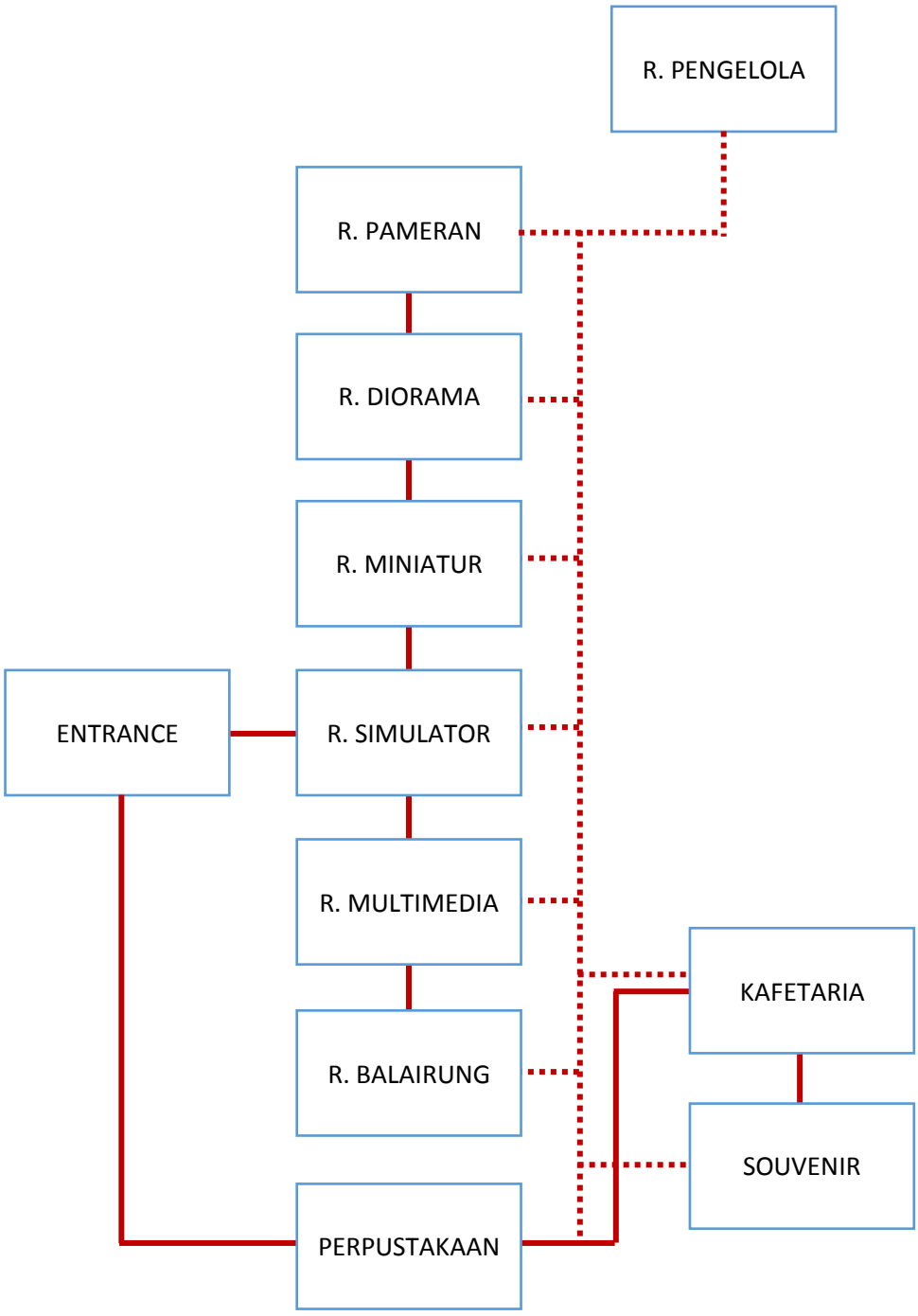
Keterangan :

: Zona Taman Dirgantara

: Zona Entrance dan Bangunan Utama

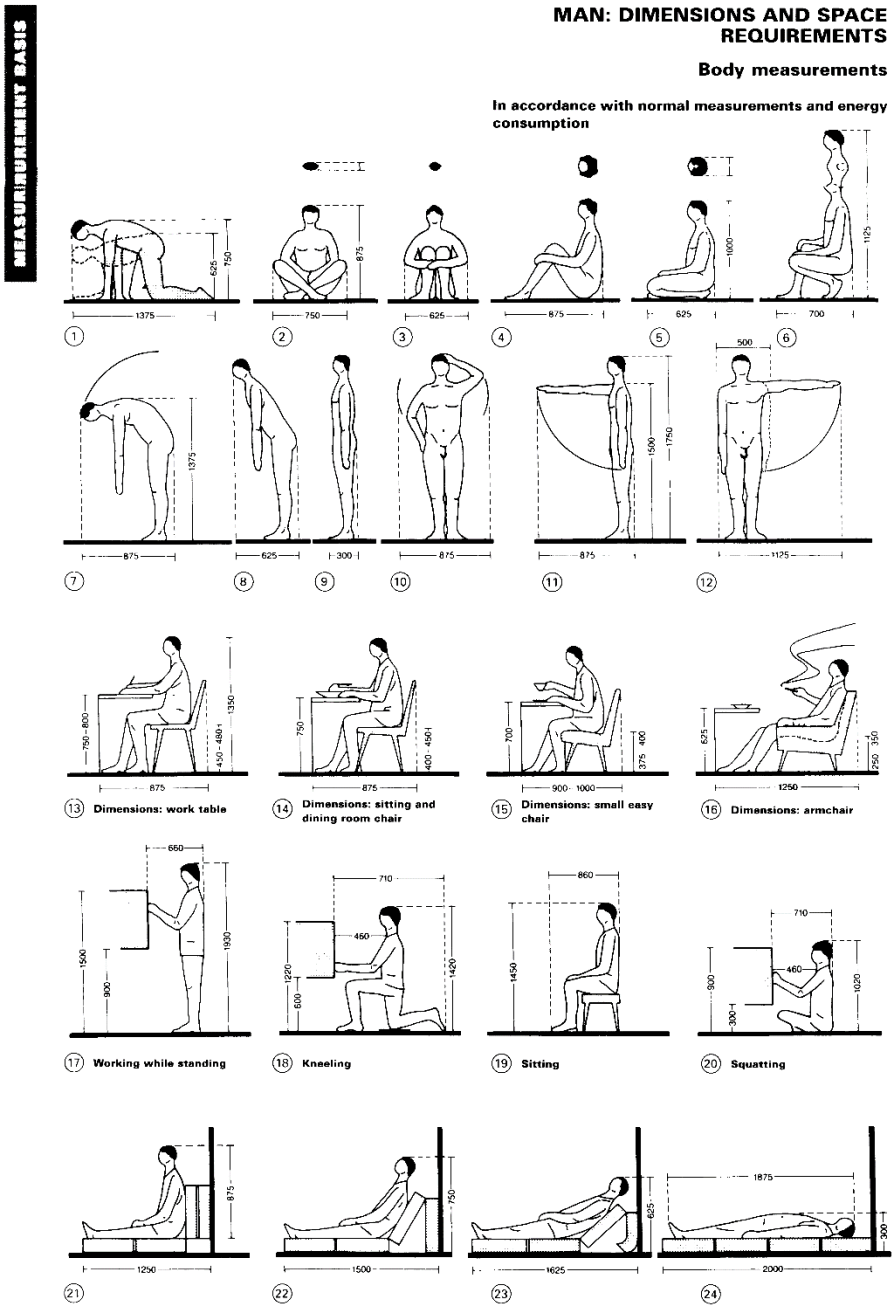
: Zona Parkir Museum

d. Program Ruang

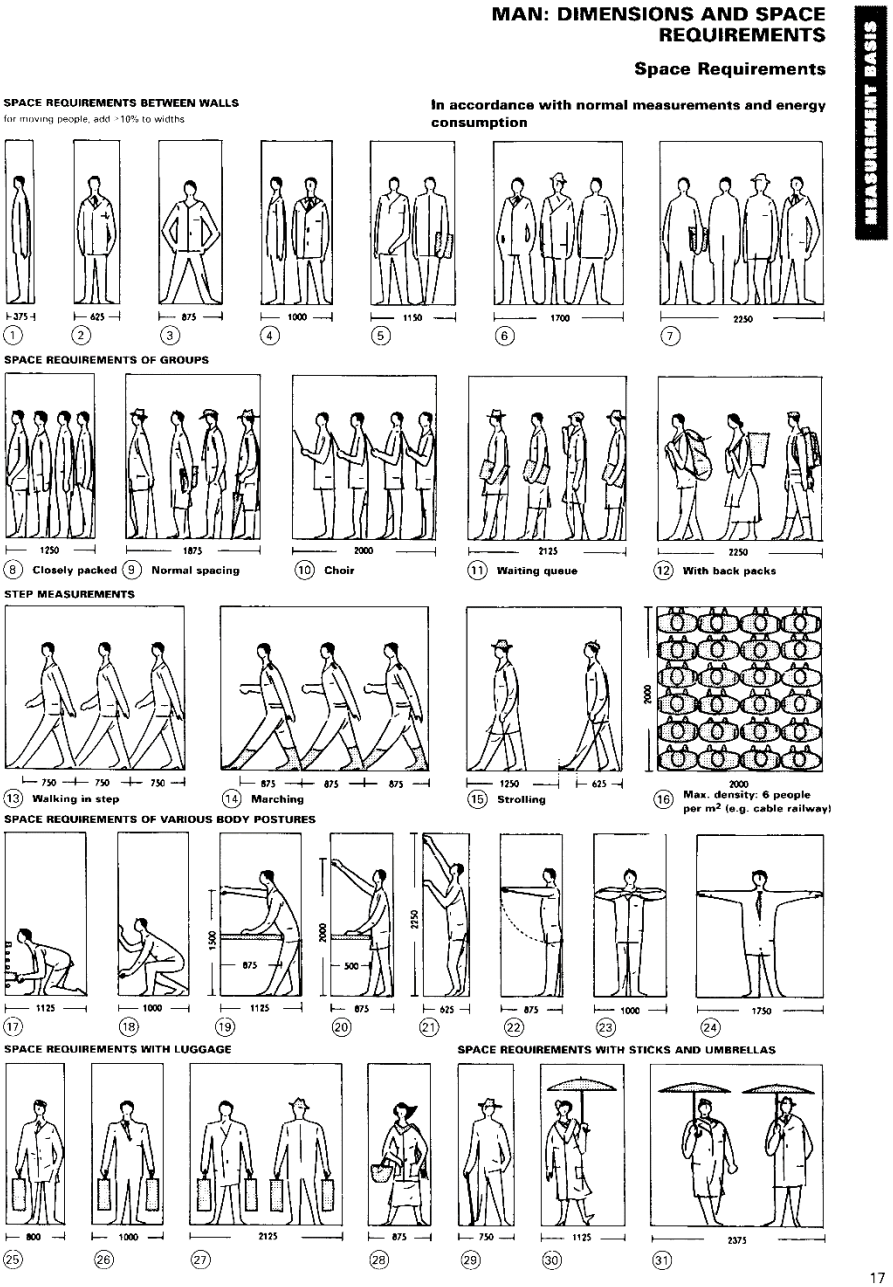


Tabel 6. Program Ruang
(Sumber : Dok. Pribadi)

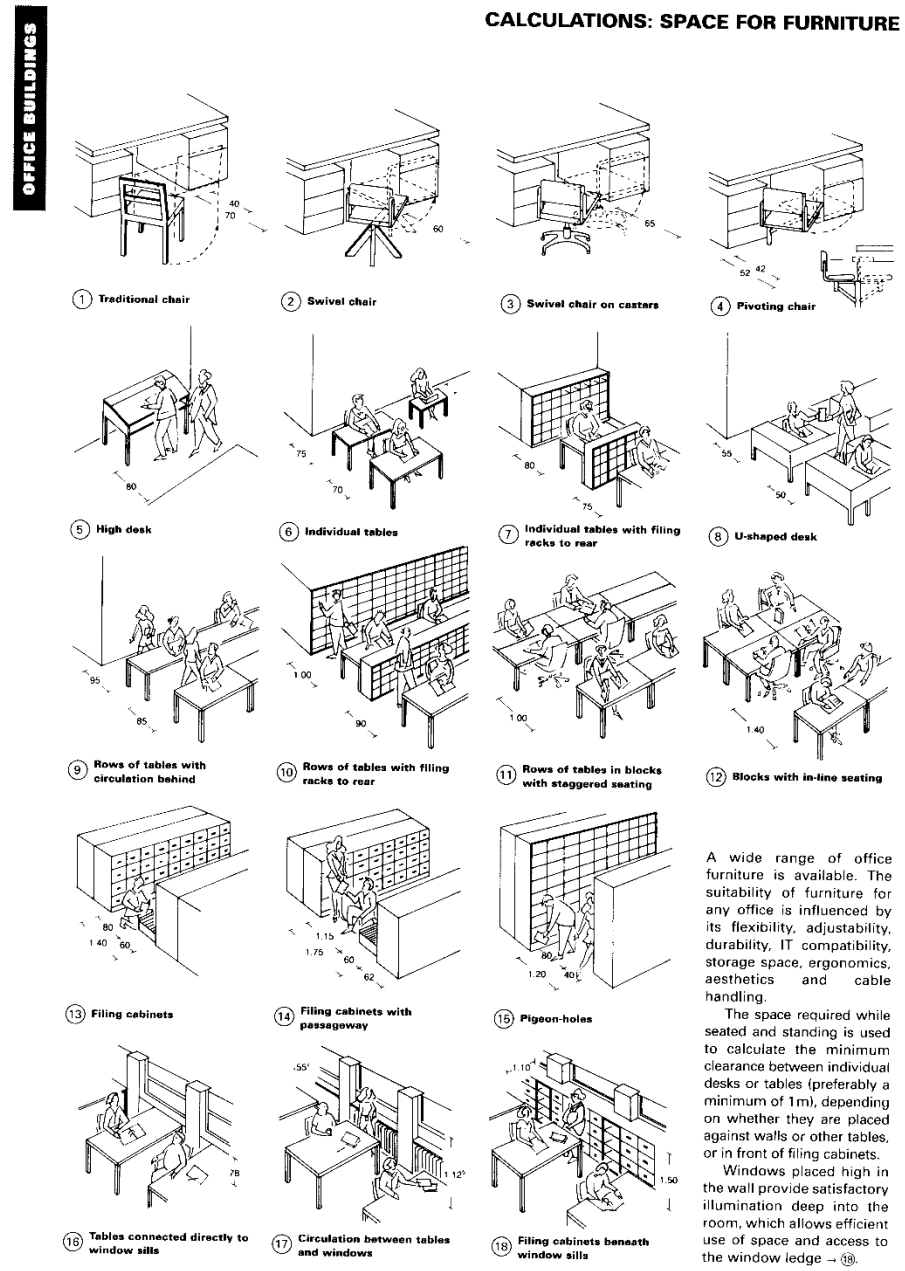
e. Persyaratan Teknis



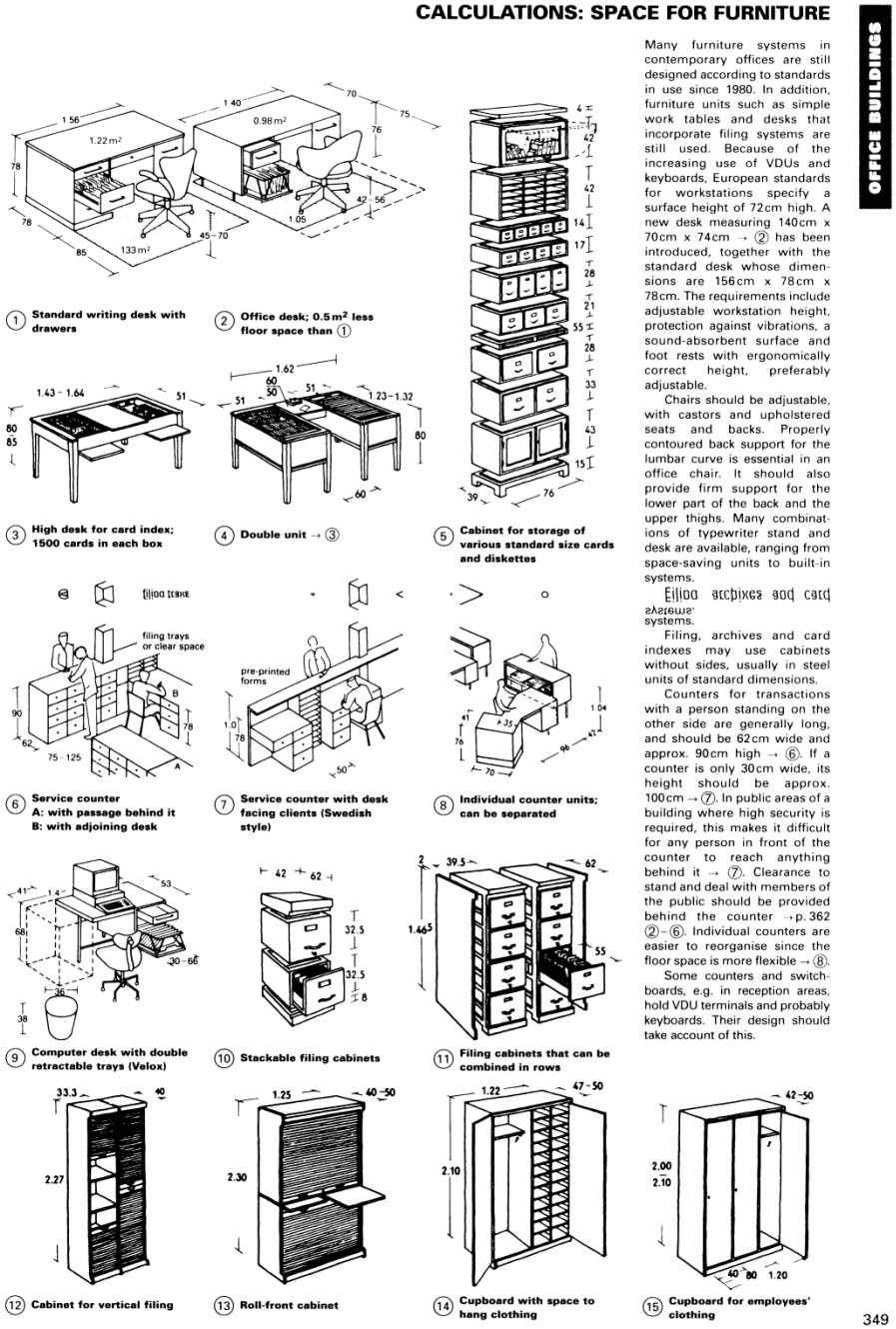
Gambar 18. Dimensi dan Kebutuhan Ruang
(Sumber : Neufert)



Gambar 19. Dimensi dan Kebutuhan Ruang 2
(Sumber : Neufert)



Gambar 20. Space for Furniture
(Sumber : Neufert)



CALCULATIONS: SPACE FOR FURNITURE

OFFICE BUILDINGS

Many furniture systems in contemporary offices are still designed according to standards in use since 1980. In addition, furniture units such as simple work tables and desks that incorporate filing systems are still used. Because of the increasing use of VDUs and keyboards, European standards for workstations specify a surface height of 72cm high. A new desk measuring 140cm x 70cm x 74cm → ② has been introduced, together with the standard desk whose dimensions are 156cm x 78cm x 78cm. The requirements include adjustable workstation height, protection against vibrations, a sound-absorbent surface and foot rests with ergonomically correct height, preferably adjustable.

Chairs should be adjustable, with castors and upholstered seats and backs. Properly contoured back support for the lumbar curve is essential in an office chair. It should also provide firm support for the lower part of the back and the upper thighs. Many combinations of typewriter stand and desk are available, ranging from space-saving units to built-in systems.

Filing archives and card systems.

Filing, archives and card indexes may use cabinets without sides, usually in steel units of standard dimensions.

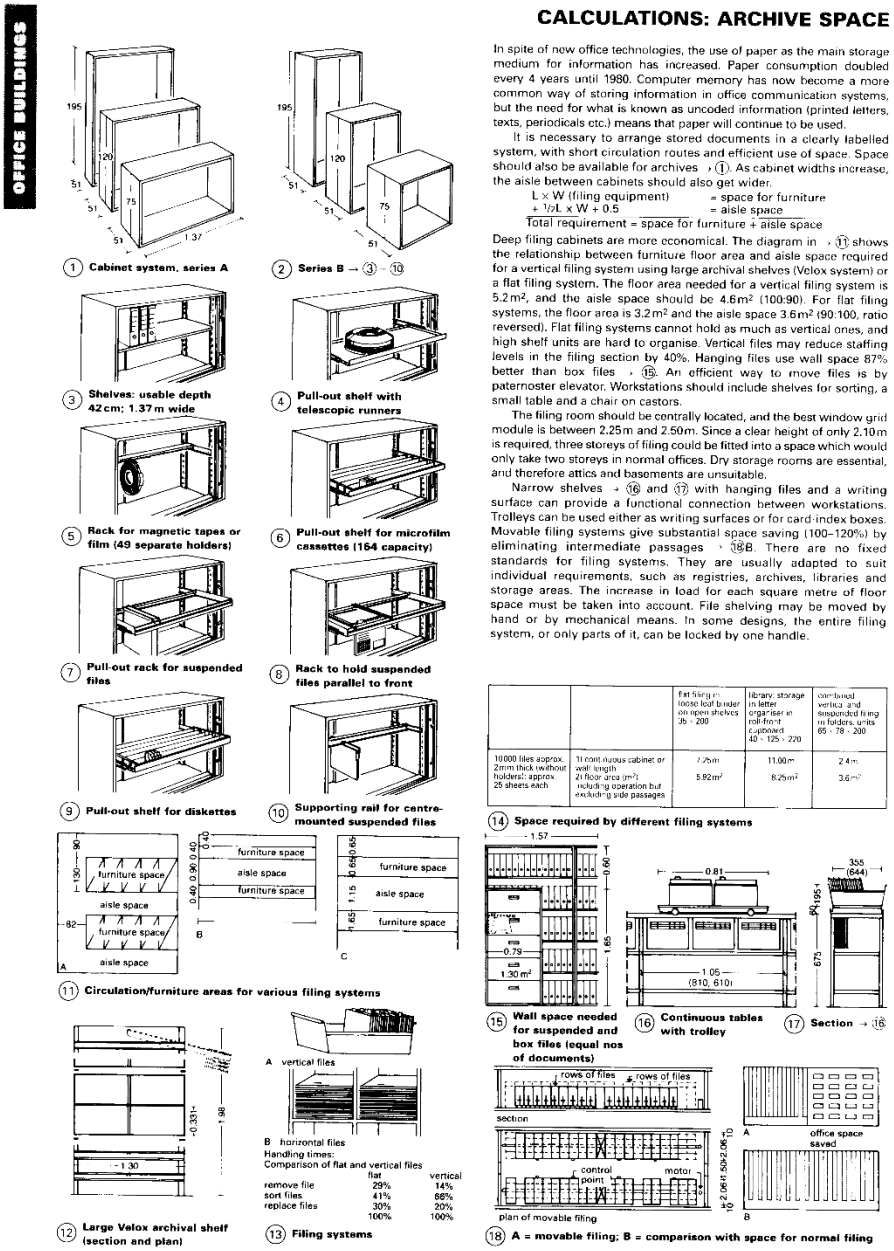
Counters for transactions with a person standing on the other side are generally long, and should be 62cm wide and approx. 90cm high → ⑥. If a counter is only 30cm wide, its height should be approx. 100cm → ⑦. In public areas of a building where high security is required, this makes it difficult for any person in front of the counter to reach anything behind it → ⑦. Clearance to stand and deal with members of the public should be provided behind the counter →p. 362 ②–⑥. Individual counters are easier to reorganise since the floor space is more flexible → ⑧.

Some counters and switchboards, e.g. in reception areas, hold VDU terminals and probably keyboards. Their design should take account of this.

① Standard writing desk with drawers
② Office desk; 0.5 m² less floor space than ①
③ High desk for card index; 1500 cards in each box
④ Double unit → ③
⑤ Cabinet for storage of various standard size cards and diskettes
⑥ Service counter A: with passage behind it B: with adjoining desk
⑦ Service counter with desk facing clients (Swedish style)
⑧ Individual counter units; can be separated
⑨ Computer desk with double retractable trays (Velox)
⑩ Stackable filing cabinets
⑪ Filing cabinets that can be combined in rows
⑫ Cabinet for vertical filing
⑬ Roll-front cabinet
⑭ Cupboard with space to hang clothing
⑮ Cupboard for employees' clothing

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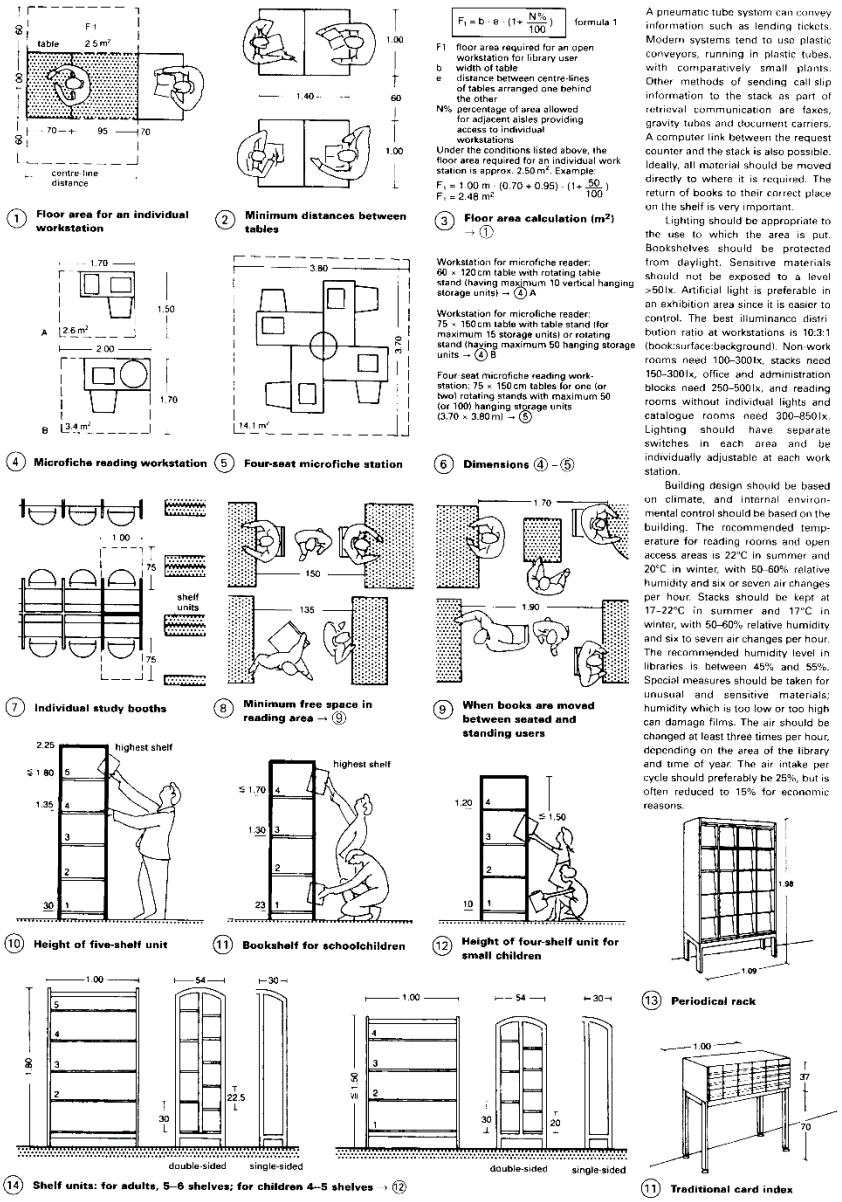
Gambar 21. Space for Furniture 2
(Sumber : Neufert)



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Gambar 22. Archive Space
(Sumber : Neufert)

LIBRARIES



① Floor area for an individual workstation

② Minimum distances between tables

$$F_1 = b \cdot e \cdot \left(1 + \frac{N\%}{100}\right) \quad \text{formula 1}$$

F_1 floor area required for an open workstation for library user
b width of table
e distance between centre-lines of tables arranged one behind the other
N% percentage of area allowed for adjacent aisles providing access to individual workstations

Under the conditions listed above, the floor area required for an individual work station is approx. 2.50 m². Example:

$F_1 = 1.00 \cdot (0.70 + 0.95) \cdot \left(1 + \frac{50}{100}\right)$
$F_1 = 2.48\ m^2$

③ Floor area calculation (m²) → ①

Workstation for microfiche reader: 60 × 120 cm table with rotating table stand (having maximum 10 vertical hanging storage units) → ④ A

Workstation for microfiche reader: 75 × 160 cm table with table stand (for maximum 15 storage units) or rotating stand (having maximum 50 hanging storage units → ④ B

Four seat microfiche reading workstation: 75 × 160 cm tables for one (or two) rotating stands with maximum 50 (or 100) hanging storage units (3.70 × 3.80 m) → ⑤

④ Microfiche reading workstation ⑤ Four-seat microfiche station ⑥ Dimensions ④–⑤

⑦ Individual study booths

⑧ Minimum free space in reading area → ⑨

⑨ When books are moved between seated and standing users

⑩ Height of five-shelf unit

⑪ Bookshelf for schoolchildren

⑫ Height of four-shelf unit for small children

⑭ Shelf units: for adults, 5–6 shelves; for children 4–5 shelves → ⑫

A pneumatic tube system can convey information such as lending tickets. Modern systems tend to use plastic conveyors, running in plastic tubes, with comparatively small plants. Other methods of sending call slip information to the stack as part of retrieval communication are faxes, gravity tubes and document carriers. A computer link between the request counter and the stack is also possible. Ideally, all material should be moved directly to where it is required. The return of books to their correct place on the shelf is very important.

Lighting should be appropriate to the use to which the area is put. Bookshelves should be protected from daylight. Sensitive materials should not be exposed to a level >50 lx. Artificial light is preferable in an exhibition area since it is easier to control. The best illuminance distribution ratio at workstations is 10:3:1 (book:surface:background). Non-work rooms need 100–300 lx, stacks need 150–300 lx, office and administration blocks need 250–500 lx, and reading rooms without individual lights and catalogue rooms need 300–850 lx. Lighting should have separate switches in each area and be individually adjustable at each work station.

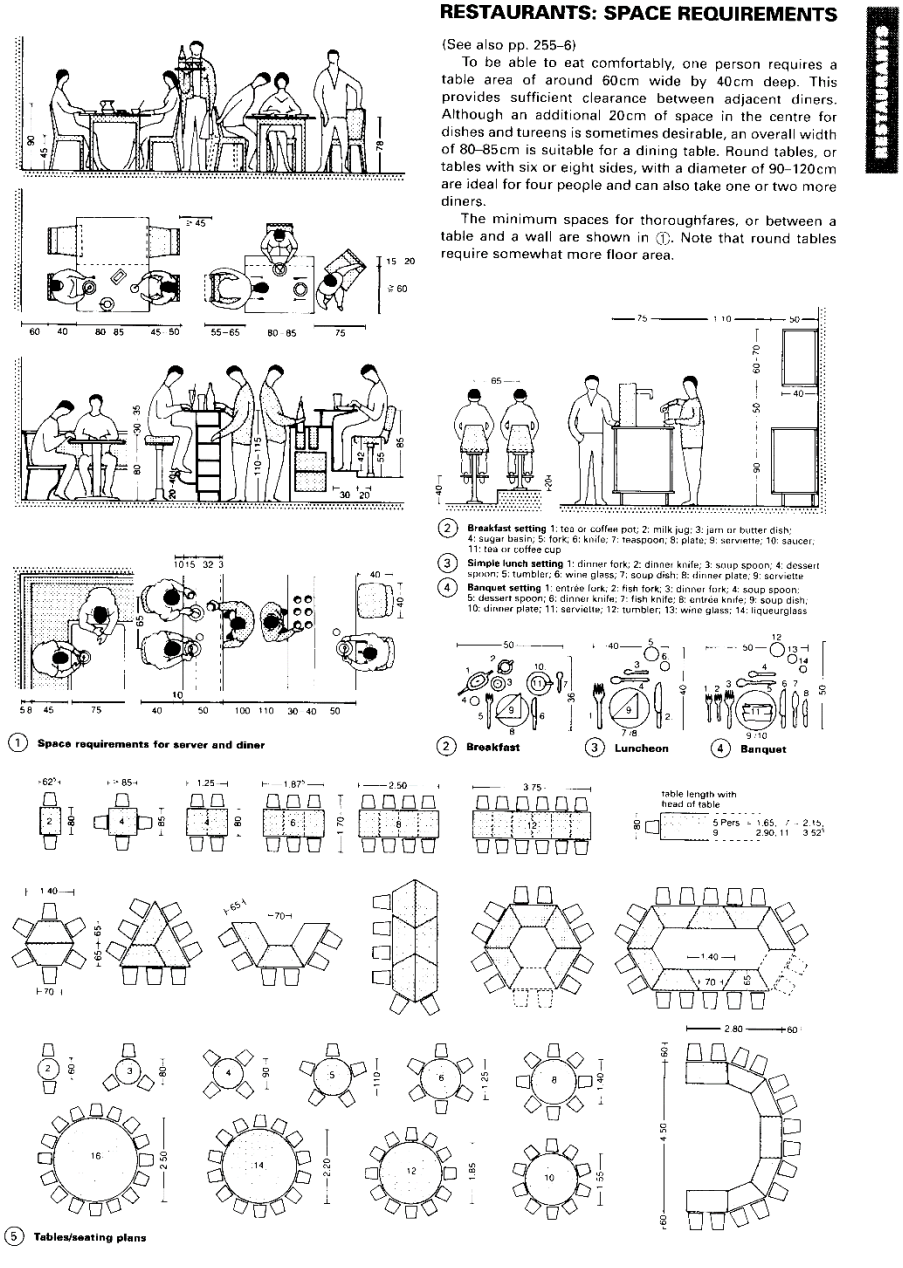
Building design should be based on climate, and internal environmental control should be based on the building. The recommended temperature for reading rooms and open access areas is 22°C in summer and 20°C in winter, with 50–60% relative humidity and six or seven air changes per hour. Stacks should be kept at 17–22°C in summer and 17°C in winter, with 50–60% relative humidity and six to seven air changes per hour. The recommended humidity level in libraries is between 45% and 55%. Special measures should be taken for unusual and sensitive materials; humidity which is too low or too high can damage films. The air should be changed at least three times per hour, depending on the area of the library and time of year. The air intake per cycle should preferably be 25%, but is often reduced to 15% for economic reasons.

⑬ Periodical rack

⑪ Traditional card index

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Gambar 23. Libraries
(Sumber : Neufert)



RESTAURANTS: SPACE REQUIREMENTS

RESTAURANTS

(See also pp. 255–6)

To be able to eat comfortably, one person requires a table area of around 60cm wide by 40cm deep. This provides sufficient clearance between adjacent diners. Although an additional 20cm of space in the centre for dishes and tureens is sometimes desirable, an overall width of 80–85cm is suitable for a dining table. Round tables, or tables with six or eight sides, with a diameter of 90–120cm are ideal for four people and can also take one or two more diners.

The minimum spaces for thoroughfares, or between a table and a wall are shown in ①. Note that round tables require somewhat more floor area.

① **Space requirements for server and diner**

② **Breakfast setting** 1: tea or coffee pot; 2: milk jug; 3: jam or butter dish; 4: sugar basin; 5: fork; 6: knife; 7: teaspoon; 8: plate; 9: serviette; 10: saucer; 11: tea or coffee cup

③ **Simple lunch setting** 1: dinner fork; 2: dinner knife; 3: soup spoon; 4: dessert spoon; 5: tumbler; 6: wine glass; 7: soup dish; 8: dinner plate; 9: serviette

④ **Banquet setting** 1: entrée fork; 2: fish fork; 3: dinner fork; 4: soup spoon; 5: dessert spoon; 6: dinner knife; 7: fish knife; 8: entrée knife; 9: soup dish; 10: dinner plate; 11: serviette; 12: tumbler; 13: wine glass; 14: liqueurglass

② **Breakfast** ③ **Luncheon** ④ **Banquet**

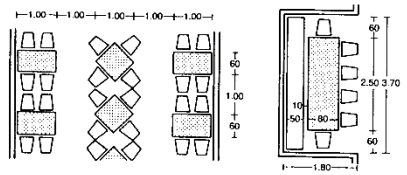
⑤ **Tables/seating plans**

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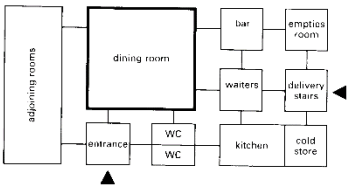
Gambar 24. Space Requirements
(Sumber : Neufert)

RESTAURANTS

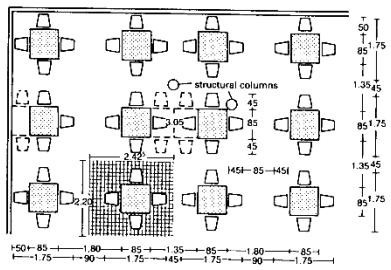
RESTAURANTS: ARRANGEMENTS



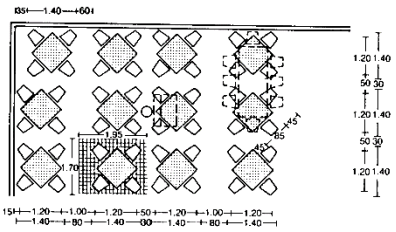
① Minimal seating layout ② Alcoves arrangement



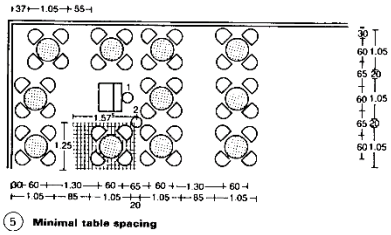
⑦ Functional layout for a small restaurant



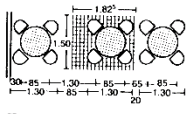
③ Parallel table arrangement



④ Diagonal table arrangement



⑤ Minimal table spacing



⑥ Café table arrangement

Before any restaurant or inn is built, the organisational sequence should be carefully planned. It is essential to establish what meals will be offered, and at what quality and quantity. It is necessary to decide whether it will be à-la-carte with fixed or changing daily menus, plate or table service, self-service or a mixed system. Before deciding on the layout, it is important to know the anticipated numbers and type of clientele and the customer mix. Bring in planning specialists in kitchen and cold store design, as well as in electrical, heating and ventilation systems and washing/toilet facilities.

The position of the site will suggest what type of inn or restaurant is likely to be suitable.

The main room of a restaurant is the customers' dining room, and the facilities should correspond with the type of operation. A number of additional tables and chairs should be available for flexible table groupings. If appropriate, provide special tables for regular customers.

Any function or conference rooms should have movable furniture to allow flexibility of use. A food bar may be installed for customers who are in a hurry. Large dining rooms can be divided into zones. The kitchen, storerooms, delivery points, toilets and other service areas should be grouped around the dining room, although toilets can be on another floor → ⑦.

Structural columns in a dining room are best in the middle of a group of tables or at the corner of a table → ③. The ceiling height of a dining room should relate to the floor area: ≤50 m², 2.50 m; >50 m², 2.75 m; >100 m², ≥3.00 m; above or below galleries, ≥2.50 m.

Guidelines for toilet requirements in inns or restaurants are shown in → ⑨.

dining floor area	walkway width
up to 100 m²	≥ 1.10 m
up to 250 m²	≥ 1.30 m
up to 500 m²	≥ 1.65 m
up to 1000 m²	> 1.80 m
over 1000 m²	> 2.10 m

⑧ Walkway widths

customer places	toilets men	toilets women	urinal bowls	urinals (m)
50	1	1	2	2
50–200	2	2	3	3
200–400	3	4	6	4
400	– determine in individual case			

⑨ Toilet facilities

The minimum width of escape routes is 1.0 m per 150 people. General walkways should be at least 1.10 m → ⑧, with clearance heights >2.10 m. The window area should be ≥ 1/10 of the room area of the restaurant.

type	chair occupancy per meal	kitchen area required (m²/cover)	dining area required (m²/seat)
exclusive restaurant	1	0.7	1.8–2.0
restaurant with high seat turnover	2–3	0.5–0.6	1.4–1.6
normal restaurant	1.5	0.4–0.5	1.6–1.8
inn/ guesthouse	1	0.3–0.4	1.6–1.8
approx. 80% supplement is added for storage rooms, personnel rooms etc. cover = seat – no. of seat changeovers			

⑩ Floor area requirements

tables	seats	waiter service (m²/seat)	self service (m²/seat)
square	4	1.25	1.25
rectangular	4	1.10	1.20
rectangular	6	1.05	1.10
rectangular	8	1.05	1.05

⑪ Total space requirements for dining rooms: 1.4–1.6 m²/place

main aisles	min 2.00 m wide
intermediate aisles	min 0.90 m wide
side aisles	min 1.20 m wide

⑫ Aisle widths

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Gambar 25. Arrangements
(Sumber : Neufert)

BUILDING FOR DISABLED PEOPLE

Houses and Apartments

Accessibility: In the rented residential sector, access via corridors is the most common layout. This enables large numbers of angles and corners to be avoided; a straight main corridor is preferable. The entrance area should be of an appropriate size, with shelves and coat hooks planned in. The minimum area of entrance halls is 1.50 × 1.50 m, and 1.70 × 1.60 m for a porch with a single-leaf door. (It should be noted, however, that minimum recommended dimensions are often not very generous and in practice can prove to be too small.) For blind residents it is important to have an intercom system at the apartment door and the building's main entrance.

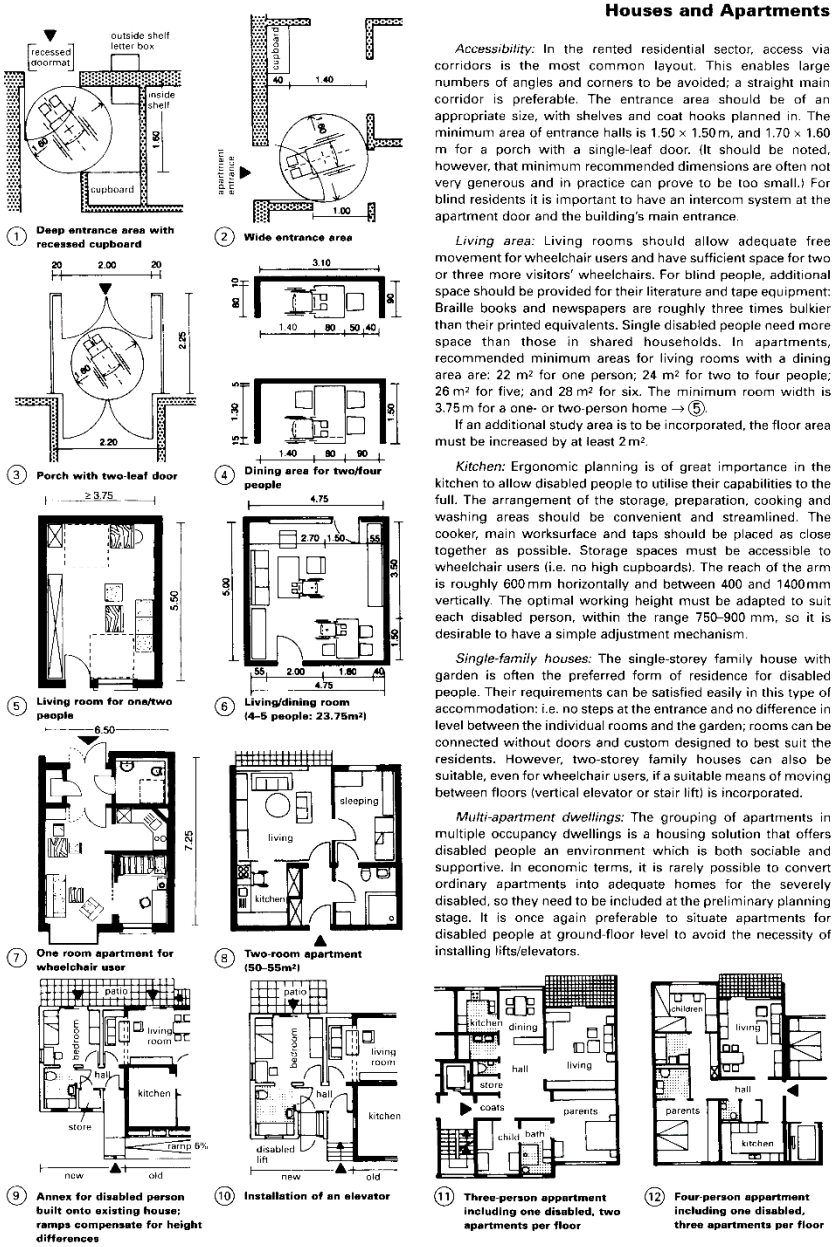
Living area: Living rooms should allow adequate free movement for wheelchair users and have sufficient space for two or three more visitors' wheelchairs. For blind people, additional space should be provided for their literature and tape equipment: Braille books and newspapers are roughly three times bulkier than their printed equivalents. Single disabled people need more space than those in shared households. In apartments, recommended minimum areas for living rooms with a dining area are: 22 m² for one person; 24 m² for two to four people; 26 m² for five; and 28 m² for six. The minimum room width is 3.75 m for a one- or two-person home → ⑤.

If an additional study area is to be incorporated, the floor area must be increased by at least 2 m².

Kitchen: Ergonomic planning is of great importance in the kitchen to allow disabled people to utilise their capabilities to the full. The arrangement of the storage, preparation, cooking and washing areas should be convenient and streamlined. The cooker, main worksurface and taps should be placed as close together as possible. Storage spaces must be accessible to wheelchair users (i.e. no high cupboards). The reach of the arm is roughly 600 mm horizontally and between 400 and 1400 mm vertically. The optimal working height must be adapted to suit each disabled person, within the range 750–900 mm, so it is desirable to have a simple adjustment mechanism.

Single-family houses: The single-storey family house with garden is often the preferred form of residence for disabled people. Their requirements can be satisfied easily in this type of accommodation: i.e. no steps at the entrance and no difference in level between the individual rooms and the garden; rooms can be connected without doors and custom designed to best suit the residents. However, two-storey family houses can also be suitable, even for wheelchair users, if a suitable means of moving between floors (vertical elevator or stair lift) is incorporated.

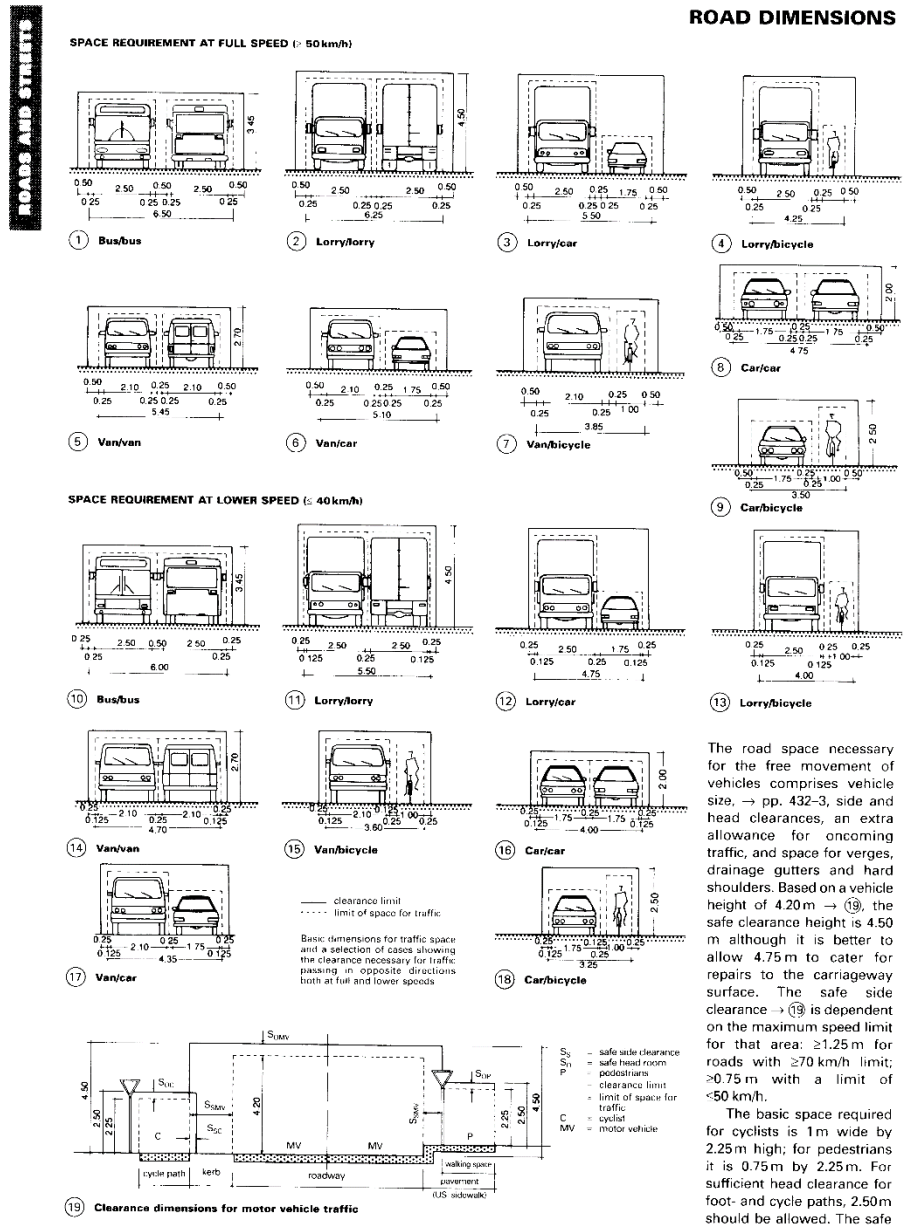
Multi-apartment dwellings: The grouping of apartments in multiple occupancy dwellings is a housing solution that offers disabled people an environment which is both sociable and supportive. In economic terms, it is rarely possible to convert ordinary apartments into adequate homes for the severely disabled, so they need to be included at the preliminary planning stage. It is once again preferable to situate apartments for disabled people at ground-floor level to avoid the necessity of installing lifts/elevators.



① Deep entrance area with recessed cupboard
② Wide entrance area
③ Porch with two-leaf door
④ Dining area for two/four people
⑤ Living room for one/two people
⑥ Living/dining room (4–5 people: 23.75m²)
⑦ One room apartment for wheelchair user
⑧ Two-room apartment (50–55m²)
⑨ Annex for disabled person built onto existing house: ramps compensate for height differences
⑩ Installation of an elevator
⑪ Three-person appartment including one disabled, two apartments per floor
⑫ Four-person appartment including one disabled, three apartments per floor

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Gambar 26. Building for Disabled People
(Sumber : Neufert)



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Gambar 27. Road Dimensions
(Sumber : Neufert)

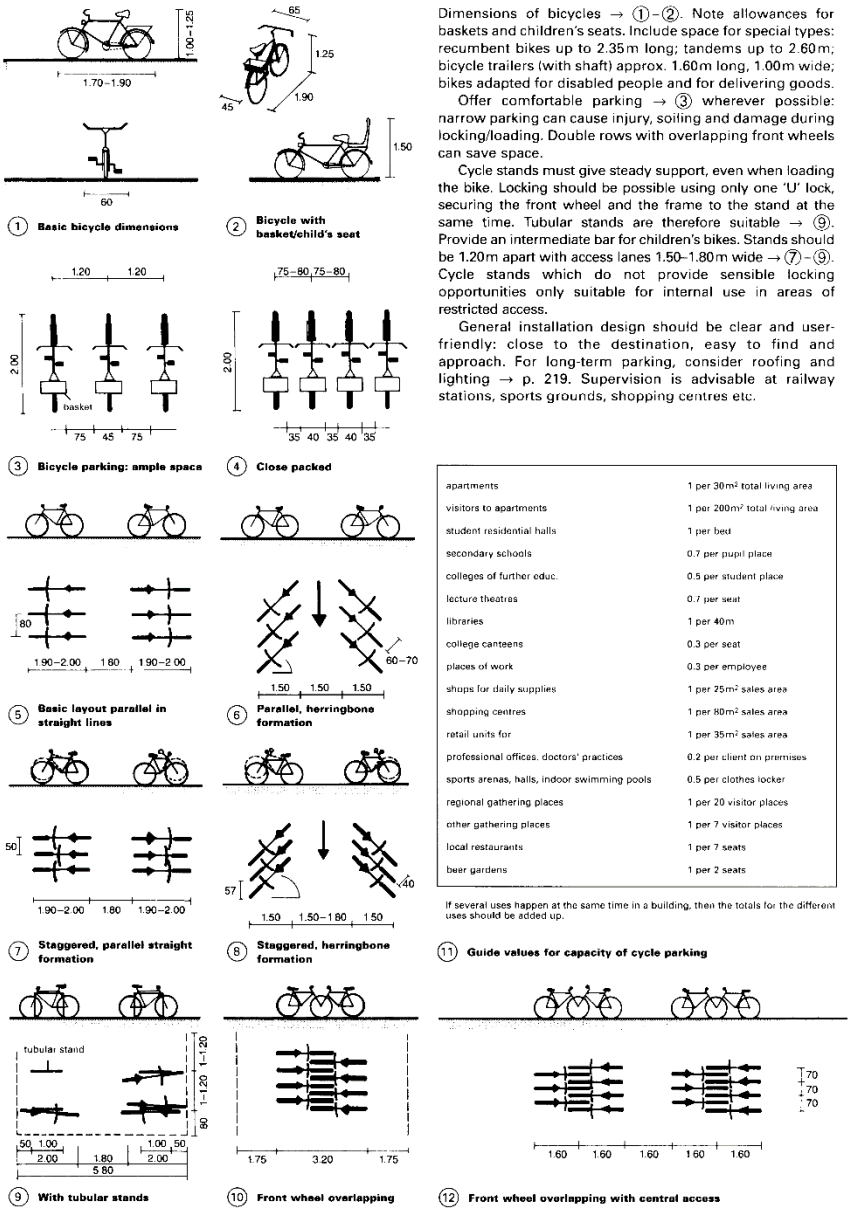
BICYCLE PARKING

Dimensions of bicycles → ①–②. Note allowances for baskets and children's seats. Include space for special types: recumbent bikes up to 2.35 m long; tandems up to 2.60 m; bicycle trailers (with shaft) approx. 1.60 m long, 1.00 m wide; bikes adapted for disabled people and for delivering goods.

Offer comfortable parking → ③ wherever possible: narrow parking can cause injury, soiling and damage during locking/loading. Double rows with overlapping front wheels can save space.

Cycle stands must give steady support, even when loading the bike. Locking should be possible using only one 'U' lock, securing the front wheel and the frame to the stand at the same time. Tubular stands are therefore suitable → ⑨. Provide an intermediate bar for children's bikes. Stands should be 1.20 m apart with access lanes 1.50–1.80 m wide → ⑦–⑨. Cycle stands which do not provide sensible locking opportunities only suitable for internal use in areas of restricted access.

General installation design should be clear and user-friendly: close to the destination, easy to find and approach. For long-term parking, consider roofing and lighting → p. 219. Supervision is advisable at railway stations, sports grounds, shopping centres etc.



① Basic bicycle dimensions
② Bicycle with basket/child's seat
③ Bicycle parking: ample space
④ Close packed
⑤ Basic layout parallel in straight lines
⑥ Parallel, herringbone formation
⑦ Staggered, parallel straight formation
⑧ Staggered, herringbone formation
⑨ With tubular stands
⑩ Front wheel overlapping
⑫ Front wheel overlapping with central access

apartments	1 per 30 m² total living area
visitors to apartments	1 per 200 m² total living area
student residential halls	1 per bed
secondary schools	0.7 per pupil place
colleges of further educ.	0.5 per student place
lecture theatres	0.7 per seat
libraries	1 per 40 m
college canteens	0.3 per seat
places of work	0.3 per employee
shops for daily supplies	1 per 25 m² sales area
shopping centres	1 per 80 m² sales area
retail units for	1 per 35 m² sales area
professional offices, doctors' practices	0.2 per client on premises
sports arenas, halls, indoor swimming pools	0.5 per clothes locker
regional gathering places	1 per 20 visitor places
other gathering places	1 per 7 visitor places
local restaurants	1 per 7 seats
beer gardens	1 per 2 seats

If several uses happen at the same time in a building, then the totals for the different uses should be added up.

⑪ Guide values for capacity of cycle parking

Gambar 28. Bicycle Parking
(Sumber : Neufert)

4.3 Kesimpulan

Berdasarkan analisa diatas maka dapat ditarik beberapa kesimpulan yang dapat menjadi informasi lanjutan dalam proses perancangan, kesimpulan tersebut antara lain :

1. Lokasi yang dipilih memiliki potensi yang baik karena akan menjadi satu kesatuan kawasan dirgantara, TNI AU, PT. Dirgantara Indonesia dan lapangan udara Husein Sastranegara
2. Infrastruktur yang berada di sekitar lokasi sangat menunjang untuk proses pengembangan selanjutnya.
3. Jalan Pajajaran dan Jalan Abdurahman Saleh, keduanya dapat dijadikan sebagai akses masuk museum sehingga dapat mengurangi kemacetan yang sering terjadi di jalan Abdurahman Saleh.