LAPORAN SKRIPSI

SEKOLAH KHUSUS DISC JOCKEY DENGAN TEMA ARSITEKTUR MODERN

SKRIPSI - AR. 8324
SEMESTER GENAP 2010-2011
Diajukan Sebagai Persyaratan Untuk Memperoleh Gelar Sarjana Teknik Arsitektur

Disusun Oleh :

HERO RAHMAT ARIEF
NIM. 06.22.049

Dosen Pembimbing :

Ir. Gaguk Sukowiyono, MT
Ir. Yuni Setyo Pramono, MT

JURUSAN TEKNIK ARSITEKTUR
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
INSTITUT TEKNOLOGI NASIONAL MALANG

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6. Bapak/Ibu dosen Institut Teknologi Nasional Malang khususnya Jurusan Teknik Arsitektur atas bimbingan dan pengajaran yang telah diberikan.

Juga tidak lupa kami sampaikan ucapan terima kasih yang sedalam-dalamnya khususnya kepada :

1. Keluarga tercinta Bapak, Ibu, dan Saudara – saudaraku yang telah memberikan perhatian, kasih sayang, doa restu, motivasi serta dorongan baik berupa materil maupun non materil.
2. Dewi aristya puspita sari, Arizal Sudiarto, Mbak Nike, Sahidun, Rindra Dwi Pratiwi, Detty Yuliani Rachmawati, Hedi Astuti, Delles Sby Crew, Balletty Bersaudara, Crew Lapet serta Rekan-rekan mahasiswa dan sahabat-sahabat yang telah banyak menyumbangkan tenaga, pikiran serta motivasi sehingga penyusunan skripsi ini dapat berjalan dengan baik.
3. Semua pihak yang tidak dapat disebutkan satu persatu di sini.

Semoga Allah SWT senantiasa memberikan rahmat dan karunia-Nya kepada semua pihak yang telah memberikan segala bantuan dan dukungan moril dalam rangka menyelesaikan skripsi ini.

Kritik dan saran yang membangun sangat diharapkan demi penyusunan yang lebih baik. Dan semoga hasil yang sederhana ini dapat bermanfaat bagi pengembangan ilmu pengetahuan dan teknologi khususnya bidang arsitektur, dan bagi semua pihak yang berkepentingan.

Malang, Maret 2012

Penyusun

SEKOLAH KHUSUS DISC JOCKEY DENGAN TEMA

ARSITEKTUR MODERN

Hero Rahmat Arief

(Program Studi Arsitektur, FTSP – ITN Malang)

ABSTRAKSI

Disc Jockey juga disebut sebagai seniman musik, karena seorang DJ harus dapat merasakan sense maupun alunan musik yang dia susun sehingga menjadi musik yang indah.

Sekarang telah berdiri sekolah-sekolah yang mengkhususkan pengajaran untuk menjadi seorang DJ (*Disc Jockey*) yang antara lain IDJS (Indonesia Disc Jockey School) di Jakarta , di malang sendiri juga memiliki satu sekolah untuk mengajarkan untuk menjadi seorang DJ yaitu DSX DJ Course yang berada di Jl.Soekarno Hatta.Sekolah DJ didirikan untuk mendidik seorang DJ menjadi seorang DJ Profesional baik dalam hal mengenal nada dasar sampai dengan teknik – teknik dalam bermain DJ, sekarang sekolah DJ hanya dipakai untuk mencari sarana keuntungan karena siswa tidak diajarkan bagaimana menjadi seorang DJ yang baik dan benar dan juga bangunan maupun ruangan Sekolah DJ yang asal-asalan sehingga membuat siswa menjadi tidak fokus dalam memainkan irama dari lagu tersebut.

Sehingga untuk menjadikan seorang DJ yang Profesional dibutuhkan bangunan maupun ruangan yang mumpuni bagi siswa yang belajar untuk menjadi sebagai seorang DJ Profesional dan juga menjadikan sarana untuk edukasi maupun tempat berkumpulnya bagi peminat musik – musik DJ. Perancangan Sekolah DJ modern dimalang ini juga dimaksudkan agar malang mempunyai Sekolah DJ dengan bentuk bangunan modern dan juga memiliki karakteristik dari segi tampilan..

DAFTAR ISI

BAB I
PENDAHULUAN

1.1. Latar belakang

Disc Jockey juga disebut sebagai seniman musik, karena seorang DJ harus dapat merasakan sense maupun alunan musik yang dia susun sehingga menjadi musik yang indah.

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1.2. Tujuan

1.2.1. tujuan perancangan

Tujuan dari perancangan Sekolah Disc Jockey ini yaitu :

1. Agar malang memiliki sekolah Disc Jockey yg dapat dipakai bukan hanya sebagai tempat belajar tapi juga sebagai tempat mengumpulnya para DJ – DJ yg ingin berbagi atau bertukar pikiran sehingga dapat meningkatkan kualitas bagi DJ junior.

2. Membantu menyediakan fasilitas Sekolah Disc Jockey bagi masyarakat yang ingin menjadi seorang Disc Jockey.

1.2.2.Sasaran perancangan.

Sasaran dalam perancangan Sekolah Dj Modern di Malang ini yaitu dari segi fungsi, aktifitas maupun luasan ruang sehingga tidak mempengaruhi kegiatan dalam belajar.

1.3.Batasan

Sekolah Dj sebagai objek rancangan hanya akan melingkupi kegiatan belajar, adapun batasan dari perancangan Sekolah Musik Dj ini yaitu:

- Bangunan Sekolah DJ modern ini berada di Kotamadya Daerah Malang , Jawa Timur .
- Ruang sesuai dengan fungsi, pola sirkulasi yang baik guna menunjang proses kegiatan di Sekolah Dj.
- Pada perancangan ini dibatasi pada analisa tentang kebutuhan akan fungsi – fungsi ruang baik dalam segi material maupun dari segi akustik sehingga dapat memaksimalkan kegiatan didalamnya.
- merencanakan fungsi – fungsi ruang yang sesuai dengan luas lahan yaitu 2 Ha dan juga luas lantai minimal 5000 m2.

1.4. Permasalahan

1.4.1. Identifikasi Masalah.

1. Membuat pelajar maupun pengajar merasa tidak terganggu berada di dalam setiap ruangan sehingga tidak mempengaruhi dari segi aksesbility hingga psikilogis.

2. Adanya fungsi – fungsi yang sesuai dengan kebutuhan akan ruang dalam proses belajar dan mengajar di Sekolah Dj.

3. Pada bagian barat Lokasi terdapat area perumahan warga.

4. Penggunaan material yang sesuai dengan fungsi ruang.

1.4.2. Rumusan Masalah

1. Bagaimana merencanakan atau menentukan ruang maupun fungsi yang sesuai dengan aktifitas yang akan dipakai.

2. Bagaimana mengkaji objek sesuai dengan data literatur maupun data survey sehingga menjadi sesuai dengan aktifitas yang ada.

3. Bagaimana menentukan fungsi maupun aktifitas didalamnya sehingga tidak mempengaruhi area perumahan yang berada disekitar site.

4. Bagaimana menentukan Material yang dipakai untuk akustik ruang sehingga tidak mempengaruhi kegiatan didalamnya.

BAB II
KAJIAN OBYEK

2.1. Studi Literatur

2.1.1. Pengertian sekolah

- Tempat anak didik mendapatkan pelajaran dari guru baik secara lisan maupun tertulis. Tujuannya untuk mempersiapkan anak didik menurut bakat dan kecakapan masing-masing,agar mampu berdiri sendiri dalam masyarakat.sekolah disusun berdasarkan tingkat pelajaran : sekolah rendah , sekolah menengah , sekolah tinggi. menurut badan pimpinanya terdapat sekolah pemerintah , sekolah agama , dan sekolah swasta. (*Ensiklopedi Indonesia jilid 5, Jakarta; PT Ichtiar baru , hal 3060*)

2.1.2. Syarat – syarat sekolah

- persyaratan dalam pembuatan sekolah yaitu didalamnya terdapat ruang kelas,ruang kepala sekolah, ruang dewan guru , perpustakaan , ruang tata usaha dan auditorium. Semua bertujuan untuk kemudahan pelayanan terhadap anak didik.selain itu sarana dan prasaranan dalam mengajar pun harus lengkap hal ini agar dapat memberikan kemudahan kepada siswa untuk dapat memahami pelajaran.

2.1.3. Pengertian Disc Jockey

- Suatu profesi dimana seseorang bertugas menyusun , memutar , dan menyambung lagu agar terdengar nyaman bagi pendengarnya dalam suatu komunitas musik. (*Kamus Musik, Yogyakarta:Kanisius , hal 25*)
- Salah satu seniman musik yang memiliki sense of music hal ini karena tugas utama mereka adalah menggabungkan dua lagu berbeda dan menjadikannya sebagai sebuah keharmonisan dalam nada atau lagu.

2.1.4. Tujuan Sekolah Disc Jockey

suatu sekolah didirikan pasti memiliki tujuan, sama hal nya dengan tujuan didirikannya Sekolah Disc Jockey ini yaitu sebagai tempat untuk melatih dan mempelajari bagaimana menjadi sebagai seorang Disc Jockey professional baik dari segi skill maupun mental.

2.1.5. silabus sekolah Disc Jockey

Pembelajaran yang diberikan pada sekolah Disc Jockey yaitu:

- *Level 1 (History , Equiptment , basic)*
  - *Introduction to the world of deejay*
  - *Introduction electronic music*
    Dikenalkan dan diajarkan genre musick trance, progressive, hiphop dsb.
  - *Basic music theory*
    Diajarkan dasar – dasar dalam bermain musik.
  - *Introduction to the DJ equiptment*
    Diajarkan tentang perlengkapan seorang DJ dan fungsinya.
  - *Basic hand to record and hand to fader technique.*
  - *Learning basic DJ equiptment*
    Diajarkan dasar – dasar penggunaan alat deejay.
  - *Equiptment set up and break down*
  - *Set up configuration*
    Tekhnik mengatur fungsi dari masing – masing peralatan DJ.
  - *Mixer operation*
    Tekhnik mengatur dan mengoperasikan mixer.
  - *Turntable operation*
    Tekhnik mengoperasikan Turntable.
  - *Basic mixing and blinding*
    Diajarkan cara tekhnik dasar – dasar mixing.
  - *Beat counting*
    Tekhnik perhitungan ketukan – ketukan tiap lagu.

- *Tempo*

  Tekhnik mengatur irama lagu.
- *Pitch control*

  Tekhnik mempercepat atau memperlambat lagu.
- *Cueing*

  Tekhnik menggabungkan sebuah lagu dengan nada awal biasanya dalam bentuk beat bass.
- *Beat to beat mixing*

- *Level 2 (mixing and blinding)*
  - *Proper use pre fades gains*

    Tekhnik menggunakan crosfadder.
  - *Equalizers*

    Tekhnik mengatur equalizer pada mixer.
  - *Creation at a 6 record set club / mixtape*
  - *Professional cd mixing*

    Tekhnik mengkombinasikan 2 lagu dengan menggunakan cdj.
  - *Advanced mixing technique*

    Tekhnik lanjutan dalam mengkombinasikan 2 lagu.
  - *Programming*

    Tekhnik pengaturan irama dalam mengkombinasikan 2 lagu.
  - *Equalizer trick*

    Trik – trik pengaturan irama dalam mengkombinasikan irama.
  - *Mixing different style pf music*

    Tekhnik mengkombinasikan 2 lagu dengan genre berbeda.
  - *Mixing trick*

- *Level 3*
  - *Basic acapella mixing music phrasing*

    Tekhnik dasar mengkombinasikan antara suarapenyanyi tanpa musik dengan musik lain.
  - *Basic scratching*

    Tekhnik dasar menimbulkan effect suara dalam sebuah lagu.
  - *Transforming*

    Tekhnik perpindahan lagu dengan cepat dan harmonis.
  - *DJ effect*

    Tekhnik menimbulkan effect suara dalam suatu lagu.
  - *Mixing transition*
  - *Looping*
  - *Basic beat juggle*
  - *Basic fader and faderless scratching*
- *Level 4*
  - *Hip – Hop and R&B (battle DJ'ing and scratching):*
    - *Learning beat 2, 4, 8, 16, 1 bar*

      Teknik memahami masuknya ketukan dalam lagu.
    - *Advanced hand to record and hand to fader technique*
    - *Chop*

      Tekhnik memotong lagu pada genre hiphop.
    - *Scratch*

      Mempelajari teknik scratch pada genre hiphop.
    - *Advanced fader and faderless scratches*
    - *Backspin*

      Teknik menarik piring hitam pada suatu lagu k lagu awal.
    - *Acapella mixing*

      Teknik mengkombinasikan lagu acapella dengan music lain genre hiphop.
    - *Body tricks*

- *Progressive / trance / triball / chill out :*
  - *Learning beat 8, 16, 32 , 48 bar*
    Teknik memahami ketukan masuk pada genre ini.
  - *Advanced hands to record and hand to fader technique*
  - *Creative mixing*
    Teknik mengkombinasikan lagu pop dengan genre progressive.
  - *Equalizer Trick*
    Trick memainkan equalizer pada genre ini.
  - *Advanced beat juggle*

- *Level 5 (recording)*
  - *Studio recording*
    Mengenal dan mempelajari peralatan merekam lagu.
  - *Remixer*
    Teknik mengkombinasikan lagu hasil ciptaan menjadi dalam satu rekaman.
  - *Beat & music composer*
    Teknik menambahkan ketukan pada lagu.

(sumber dari skripsi mahasiswa universitas kristen petra dengan Judul Perancangan interior sekolah Disc Jockey (DJ) di Surabaya)

2.1.6. Program ruang yang direncanakan

- Lobby

  Ruang ini digunakan untuk menerima tamu maupun pengunjung. Diruang ini area receptionist , area menunggu dan brosur.

- Ruang kerja

  Ruang ini digunakan untuk pengelola maupun staff pengajar sekolah. Ruang ini terbagi atas beberapa bagian sesuai dengan pekerjaannya masing-masing yaitu: ruang kerja pengelola , ruang kerja administrasi dan marketing, ruang staff pengajar dan ruang meeting.

- Record shop

  Ruang ini digunakan untuk ruang penjualan dj equiptment baik berupa hardware maupun software. Pada ruangan ini terdapat display penjualan alat dj maupun kasir.

- Studio latihan

  Studio latihan dibagi 2 bagian yaitu studio private dan studio group. Studio private hanya digunakan untuk 1 orang saja untuk latihan dasar scratching dan mixing. Sedangkan studio group digunakan untuk ingkat selanjutnya yaitu penjurusan kemasing – masing aliran musik.

- Ruang kelas

  Ruang ini digunakan untuk tempat pemberian mata pelajaran dasar-dasar dalam bermain musik.

- Record library

  Ruang ini digunakan untuk menyimpan semua alat-alat dj baik disediakan untuk murid yang sedang latihan tanpa harus membelinya.

- Clubby lounge

  Tempat ini digunakan untuk komunitas DJ maupun penggila musik bersantai dan berkumpul sambil menikmati sajian live performance DJ dengan nuansa café clubbing. Juga bisa dipakai sebagai job training bagi murid – murid yang belajar di Sekolah DJ.

- Studio recording

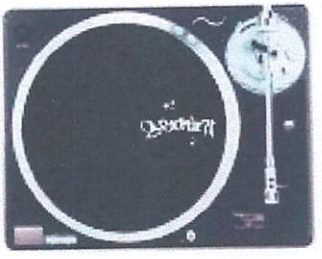
  Tempat ini digunakan bagi materi latihan terakhir setelah semuanya diselesaikan yaitu cara merekam hasil mixing lagu. Selain itu bisa digunakan oleh para DJ untuk merekam lagunya sendiri. *(sumber : http://digilib.petra.ac.id/perencanaan_interiorsekolahDJdiSurabaya)*

2.1.7. Alat – alat musik DJ

Alat yang biasa digunakan seorang Disc Jockey dalam memainkan sebuah lagu yaitu:

1. Deck and turntables

   Alat ini merupakan alat yang harus dipunyai seorang DJ karena turntables merupakan alat yang biasa digunakan untuk battle maupun mixing. (sumber: http://www.binbin.net/entertainment.html)



2. Mixer

   Mixer merupakan alat wajib yang harus dipunyai oleh seorang DJ hal ini karena mixer berfungsi sebagai pengatur irama musik bagi seorang DJ. Mixer memiliki berbagai ukuran tergantung fungsi maupun banyaknya turntable yang digunakan.semakin banyak turntable yang digunakan semakin besar juga ukuran mixer. *(sumber : http://www.dv247.com/dj-equipment/pioneer-djm-800-performance-mixer-dj-mixer--36191)*

3. Headphone

Selain mixer dan turntable headphone juga sangat penting seorang DJ hal ini karena headphone digunakan untuk menggabungkan lagu 1 dengan yang lainnya.

4. Meja Turntable

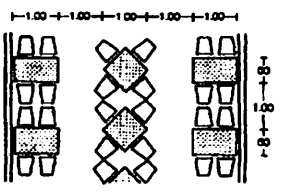
Meja digunakan sebagai tempat untuk menaruh alat – alat DJ karena dalam pemilihan meja DJ diperlukan ukuran alat yang digunakan sehingga cukup untuk alat – alat DJ.

5. Sound

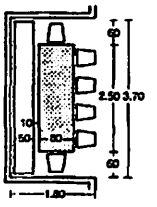
Sound merupakan alat yang penting dalam pembuatan maupun mixing musik, dalam pembuatan maupun mixing lagu selain pemakaian headphone juga diharuskan pemakaian sound luar hal ini agar kita dapat memantau kualitas lagu.

(www.tribemagazine.com)

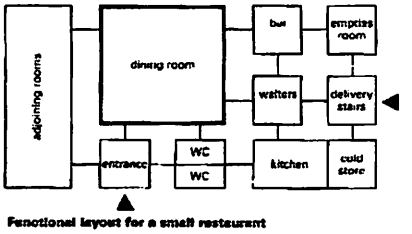
RESTAURANTS: ARRANGEMENTS



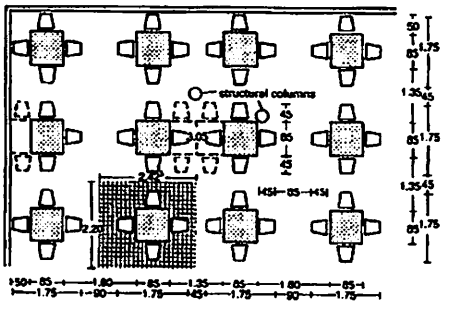
① Minimal seating layout



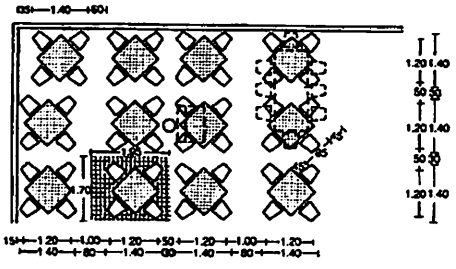
② Alcoves arrangement



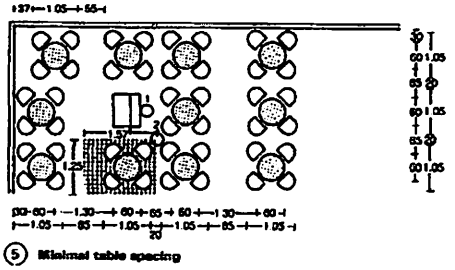
⑦ Functional layout for a small restaurant



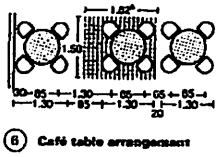
③ Parallel table arrangement



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: ≤50m², 2.50m; >50m², 2.75m; >100m², ≥3.00m; above or below galleries, ≥2.50m.

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

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

⑧ Walkway widths

customer places	toilets men	toilets women	urinal bowls	urinals etc.
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 1.0m per 150 people. General walkways should be at least 1.10m → ⑧, with clearance heights ≥2.10m. The window area should be ≥1/10 of the room area of the restaurant.

type	chair occupancy per m²/sit	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
snack/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 staff 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 2.00m wide
intermediate aisles	min 1.50m wide
side aisles	min 1.20m wide

⑫ Aisle widths

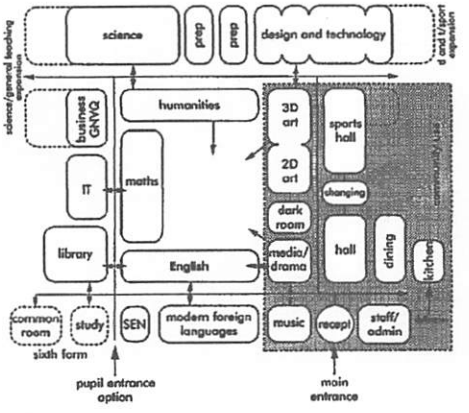
SECONDARY SCHOOLS

Staff accommodation

In a typical secondary school today, staff accommodation will include offices for senior teaching staff, some small, local departmental staff work rooms and a central staff room providing work space for the remaining staff and a social area for all teaching staff who wish to use it. The main staff room should preferably be secluded from noisier parts of the school, but centrally located.

Timetabled teaching areas

The secondary school curriculum is normally taught in distinct subjects, using a variety of timetabled teaching rooms which tend to be used predominantly for one subject. Almost half the subjects taught in secondary schools are 'general teaching', normally only requiring standard classrooms. These subjects include English, mathematics, modern foreign languages (MFL), humanities (history and geography), religious education, personal and social education (PSE) and general studies. The remainder usually require specialist spaces which are less likely to be interchangeable, although art and graphics or music and drama may share spaces. IT rooms will be required as a timetabled and bookable resource for most subjects, particularly business studies, GNVQ, MFL, humanities and design and technology.



24 Bubble diagram showing possible arrangement of spaces and activities in an 11–16 (11–18) secondary school (design and technology includes multi-materials, pneumatics, electronic and control technology (PECT), textiles, food and graphics)

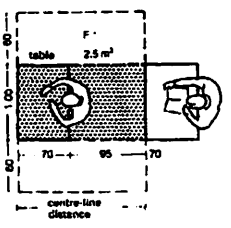
Size, shape and layout The size, shape and layout of individual teaching rooms should provide a space which has the flexibility to accommodate a broad range of activities. Keeping fixed furniture and equipment to the perimeter and loose furniture to the centre is recommended. A space which is too narrow may restrict the range of activities and the possible furniture layouts (see pp 40–41), particularly in practical spaces where there may be large items of equipment with minimum space requirements

	likely maximum group size	*typical average area (m^2) or no. of rooms**	*no. of spaces or total area required* 600	900	1200
timetabled teaching					
general teaching					
standard classroom	30	50	12	17	22
large classroom	30	62	3	4	6
IT room	30	72	2	3	4
science laboratory	30	84	5	7	9
design and technology					
food room	21	85	1	1	2
multi-materials workshop	21	100	1	2	2
pneumatics/electronics/ control/tech	21	88	1	1	2
textiles (dry, including sewing)	21	84	1	1	1
graphics	21	78	–	–	1
art					
general 2D art room	30	90	–	1	1
3D art (incl. ceramics kiln if req'd)	30	105	1	1	1
wet textiles and 2D art	30	105	1	–	1
music room	30	65	1	2	2
drama studio/music recital room	30	90	1	1	2[a]
gymnasium	30	260	1	–	–
sports hall	30	594	–	1	1
non-timetabled teaching					
assembly hall	–	–	240[b] m^2	240[c] m^2	260[b] m^2
SEN classroom	6	22	1	1	1
music group/practice rooms	5	6	3	6	6
music ensemble room (or recording studio)	7	20	1	2	2
small group room	3	6	1	1	1
heat treatment bay	4	16	1	1	1
food technology/testing area	5	15	1	1	1
kiln room or dark room	4	10	1	1	1
IT cluster/resource area	8	24	1	2	3
library resource centre	10% of NOR	1*	128m^2	155m^2	182m^2
total teaching area			***2831m^2***	***3956m^2***	***5087m^2***
non teaching areas					
dining areas	–	–	180m^2	232m^2	270m^2
kitchen (incl. staff and stores)	–	–	90m^2	116m^2	135m^2
lockers for personal storage		0.1	450	675	900
pupils' toilets (area per fitting) (area per locker)	–	3	29	43	57
changing facilities incl. showers	1 year group	–	60m^2	90m^2	120m^2
science prep/store room	–	1*	64m^2	89m^2	115m^2
multi-materials prep room	–	1*	46m^2	48m^2	52m^2
walk-in teaching stores:					
general teaching/SEN/IT	–	2.5	40	47	56
off practical spaces	–	6	13	15	24
music and external	–	10	2	3	3
PE equipment	–	25	1	2	2
head's office/meeting room	–	24	1	1	1
senior management offices	–	8	6	7	8
librarian/SEN offices	–	12	2	2	2
admin/secretaries/reception	–	–	32m^2	48m^2	63m^2
staff room (social)	–	–	32m^2	48m^2	63m^2
staff work room(s)	–	–	40m^2	60m^2	75m^2
reprographics	–	–	12m^2	18m^2	24m^2
staff changing rooms	–	–	4m^2	4m^2	4m^2
staff toilets (area per fitting)	–	3.5	6	8	11
central stock/exam store	–	5	2	3	4
MI room	3	12	1	1	1
cleaner's stores	–	1.5	4	6	8
caretaker's office/maintenance store	–	–	20m^2	25m^2	30m^2
plant	–	–	60m^2	85m^2	110m^2
corridors/circulation	–	–	760m^2	1065m^2	1320m^2
internal partitions	–	–	120m^2	167m^2	212m^2
total gross area			***4842m^2***	***6689m^2***	***8479m^2***

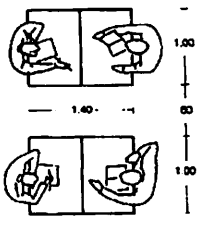
a: 1 of each; b: partially timetabled for PE; c: partially timetabled for drama

25 Typical schedule of spaces for an 11–16 secondary school

LIBRARIES



① Floor area for an individual workstation



② Minimum distances between tables

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

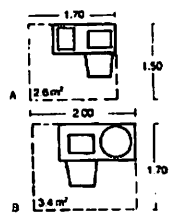
F1 floor area required for an open workstation for library user
b width of table
e distance between centre-lines of tables arranged one behind the other
N% percentage of area allowed for adjacent sides providing access to individual workstations

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

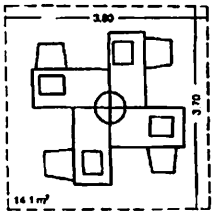
$F_1 = 1.00 \text{ m} \cdot (0.70 + 0.95) \cdot \left(1 + \frac{50}{100}\right)$

$F_1 = 2.48 \text{ m}^2$

③ Floor area calculation (m²) → ①



④ Microfiche reading workstation



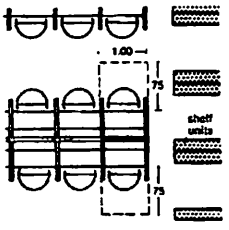
⑤ Four-seat microfiche station

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

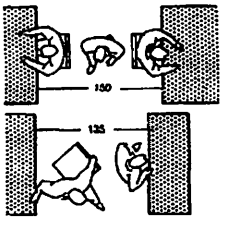
Workstation for microfiche reader: 75 × 150 cm table with table stand (for maximum 15 storage units) or rotating stand (having maximum 50 hanging storage units → ④ B

Four-seat microfiche reading workstation: 75 × 150 cm tables for one to two rotating stands with maximum 50 (or 100) hanging storage units (3.70 × 3.80 m) → ⑤

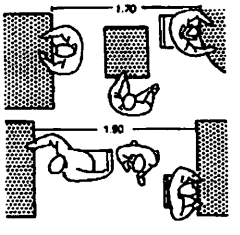
⑥ Dimensions ④–⑤



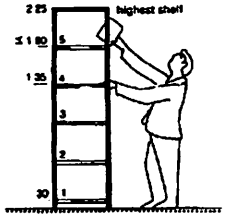
⑦ Individual study booths



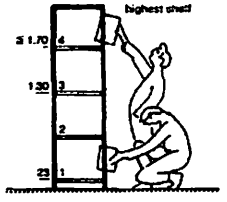
⑧ Minimum free space in reading area → ⑨



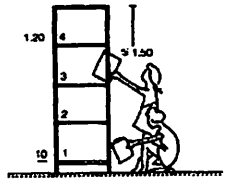
⑨ When books are moved between seated and standing users



⑩ Height of five-shelf unit



⑪ Bookshelf for schoolchildren

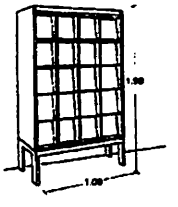


⑫ Height of four-shelf unit for small children

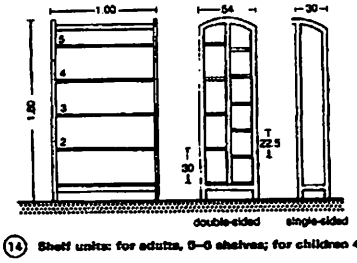
A pneumatic tube system can convey information such as lending tickets. Modern systems tend to use plastic conveyors, running in plastic tubes, with comparatively small plants. Other methods of sending call-slip information to the stack as part of retrieval communication are faxes, gravity tubes and 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.

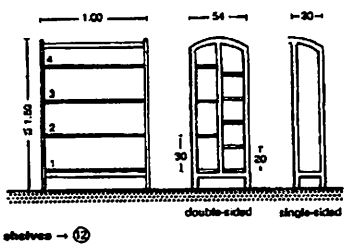
Lighting should be appropriate to the use to which the area is put. Bookshelves should be protected from daylight. Sensitive materials should not be exposed to a level >50lx. Artificial light is preferable in an exhibition area since it is easier to control. The best illuminance distribution ratio at workstations is 10:3:1 (bookssurface:background). Non-work rooms need 100–300lx, stacks need 150–300lx, office and administration blocks need 250–500lx, and reading rooms without individual lights and catalogue rooms need 300–650lx. 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.

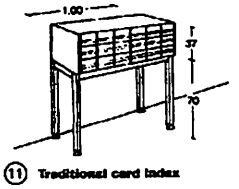


⑬ Periodical rack

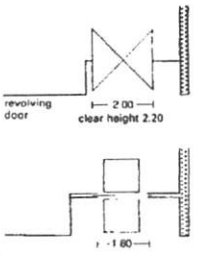




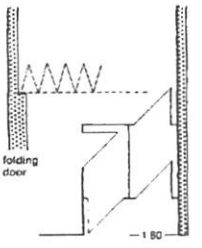
⑭ Shelf units: for adults, 5–6 shelves; for children 4–5 shelves → ⑫



⑪ Traditional card index

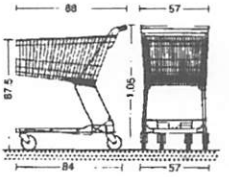


① Sliding doors

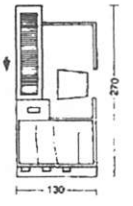


② Air lock

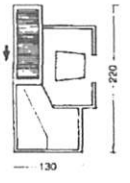
③ Shopping trolley: volume up to 150 l



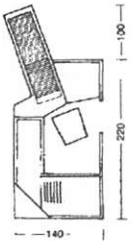
④ Shopping trolley: load up to 200 kg



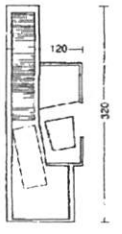
⑤ Supermarket check-out desk



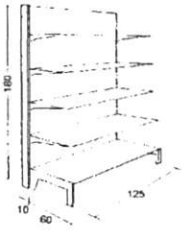
⑥ Variation on ⑤



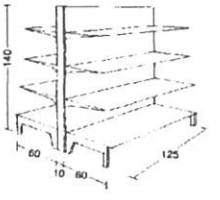
⑦ Variation on ⑤



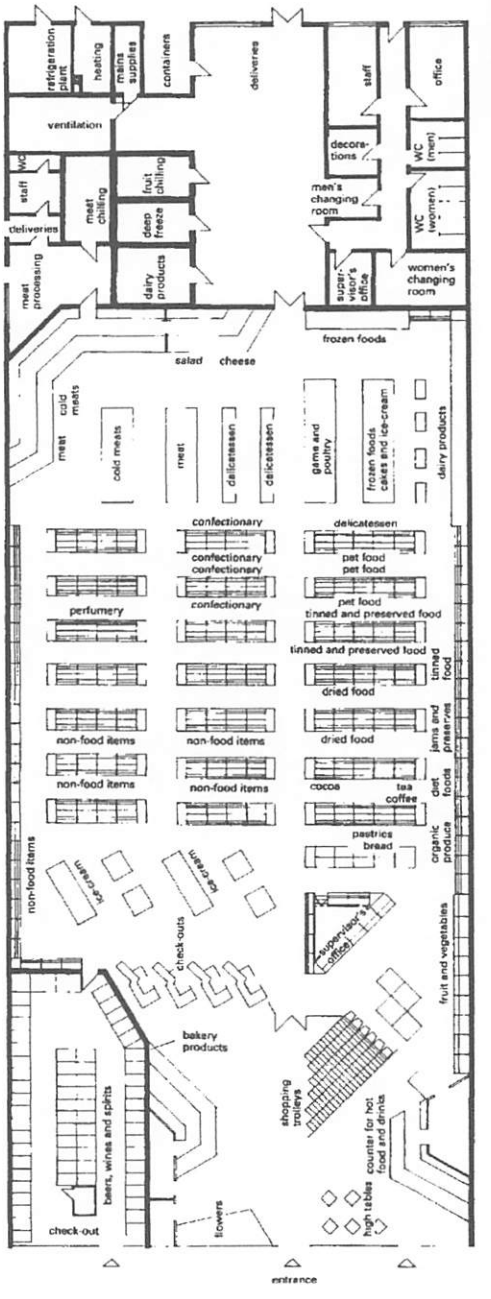
⑧ Variation on ⑤



⑨ Wall shelving → ⑪



⑩ Free-standing shelf unit → ⑪



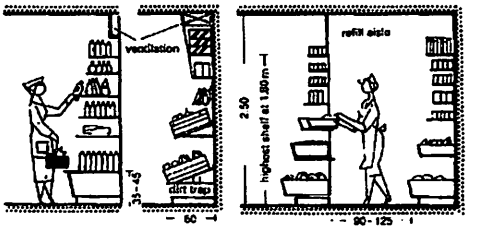
⑪ Supermarket

SHOPS

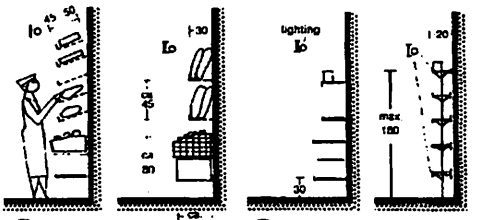
Shelf units in shops › ① – ⑥ from which customers pick their own goods should be no higher than 1.8m and no lower than 0.3m above floor level.

Attention must be paid to circulation routes in larger shops › ⑩ + ⑪. They should begin at the trolley/basket pick-up and end at the check-outs.

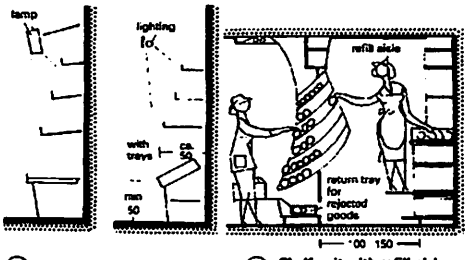
All shops require some provision for the handling of goods. These needs may vary from off-pavement deliveries for small units to the complex operations carried out by large retail businesses.



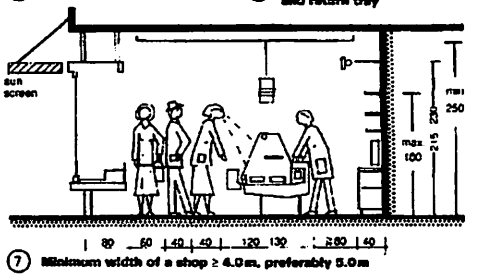
① Shelves for bottles Shelves for fruit, vegetables and loose goods ② Partition allowing replacement of containers from refilling aisle



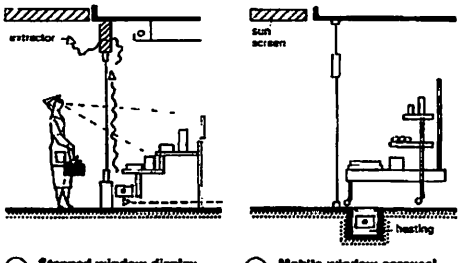
③ Bread display ④ Shelf display unit



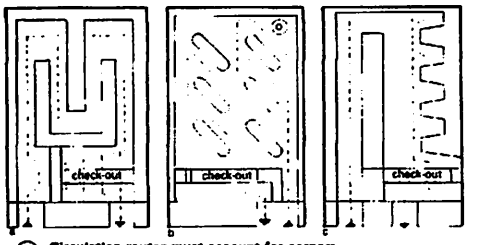
⑤ Self-service shelves ⑥ Shelf unit with refill aisle and return tray



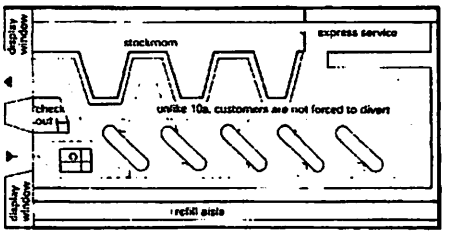
⑦ Minimum width of a shop ≥ 4.0m, preferably 5.0m



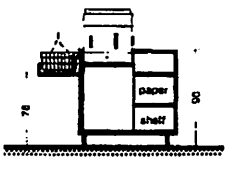
⑧ Stepped window display, with protective glass behind ⑨ Mobile window carousel, protective screen behind



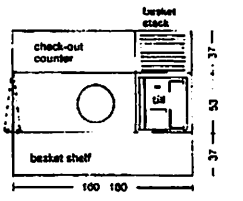
⑩ Circulation routes must account for corners (a and c, entrance and exit separate; b, together)



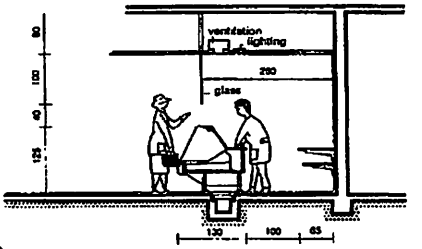
⑪ Good view of the whole shop from check-outs is essential for customer convenience and security



⑫ Section through small check-out position

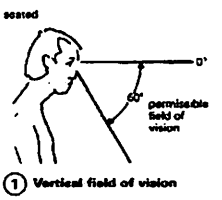


⑬ Plan of a check-out position giving minimum dimensions

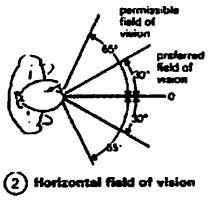


⑭ Section through counter in a self-service shop

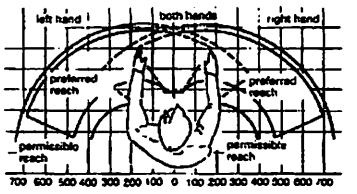
CALCULATIONS: WORKSTATIONS WITH COMPUTERS



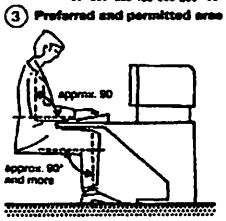
① Vertical field of vision



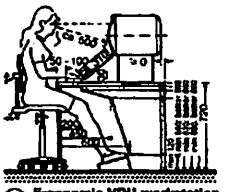
② Horizontal field of vision



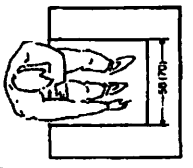
③ Preferred and permitted area of reach



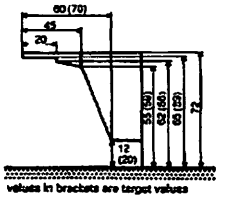
④ Correct ergonomic position



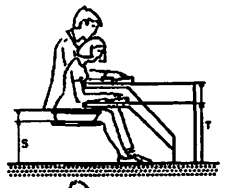
⑤ Ergonomic VDU workstation with fixed-height table

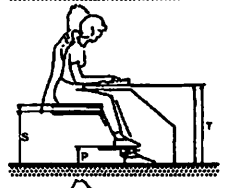


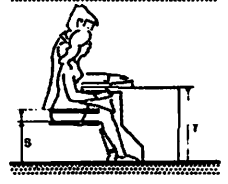
⑥ Leg space

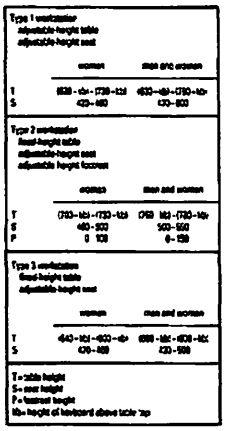


values in brackets are target values









⑦ Dimensions of workstation furniture

Workstations equipped with a computer must accommodate at least a visual display unit (VDU) and an alphanumeric keyboard. There is no standard for such workstations because the requirements vary widely depending on individual work processes (e.g. from a simple networked terminal for enquiries to stand-alone systems for data entry and manipulation, which in addition to the VDU and keyboard may also have disk drives, scanners, printers and other peripherals). These workstations should be designed according to national safety requirements and generally accepted technical standards for good practice based on an understanding of ergonomics.

Workstation design

Items that are used frequently should be placed within the preferred field of vision and reach area › ① - ③.

The best working position is when the person is seated with the upper arm perpendicular to the floor and the forearm at a 90° angle. The thighs should be parallel to the floor with the lower leg at a 90° angle › ④. The table and chair must be adjustable to allow proper positioning for users of different heights. Two ergonomic systems are equally acceptable.

A: Type 1 workstation

Adjustable-height table	60–78cm
Adjustable-height chair	42–54cm

B: Types 2 and 3 workstations

Fixed-height table	72cm
Adjustable-height chair	42–50cm
Adjustable foot rest	0–15cm

Sufficient leg clearance should be provided › ⑥.

In work areas, all items of equipment close to the user (on the desk top, etc.) should have a 20–25% reflection factor. Illumination should be between 300 and 500 Lx, and glare from lights must be limited (e.g. by providing specular louvred ceilings above VDU stations). Arrange lighting strips parallel to the window. Matt surfaces in the room should have the recommended reflection factors (ceiling approx. 70%, walls approx. 50%, movable partitions approx. 20–50%).

The worker's line of sight to the monitor should be parallel to the windows and to any lighting tubes; the monitor should be between these if possible. It is necessary to install blinds to control daylight at visual display workstations.

Follow local recommendations for environmental control and noise protection. The increased use of heat-generating electronic equipment in offices tends to result in the need for additional cooling to maintain a comfortable temperature.

The impact of information technology

Employment usually required attendance at a place of work because the materials and tools were there, and the work needed to be supervised. However, advances in information technology mean that the 'material' for most office work (information) can be transmitted electronically. The tools of office work are increasingly a telephone and a workstation, both of which can be installed at home. Innovations in communication technology are gradually having a major impact on how the work environment is defined. It is also freeing many workers from geographical constraints. The free-address workstation is becoming a technical reality, with portable voice and data links to anywhere in the world. However, the free-address workstation has implications for both people and organisations, such as the need for increased social interaction and new management techniques which are able to cope with a widespread workforce.

CALCULATIONS: ARCHIVE SPACE

In spite of new office technologies, the use of paper as the main storage medium for information has increased. Paper consumption doubled every 4 years until 1980. Computer memory has now become a more common way of storing information in office communication systems, but the need for what is known as uncoded information (printed letters, texts, periodicals etc.) means that paper will continue to be used.

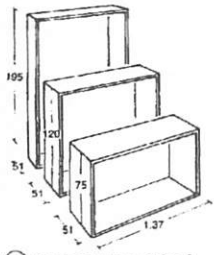
It is necessary to arrange stored documents in a clearly labelled system, with short circulation routes and efficient use of space. Space should also be available for archives → (1). As cabinet widths increase, the aisle between cabinets should also get wider.

L × W (filing equipment) = space for furniture
− ½L × W − 0.5 = aisle space
Total requirement = space for furniture + aisle space

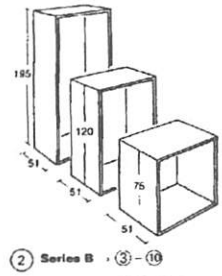
Deep filing cabinets are more economical. The diagram in → (11) shows the relationship between furniture floor area and aisle space required for a vertical filing system using large archival shelves (Velox system) or a flat filing system. The floor area needed for a vertical filing system is 5.2 m², and the aisle space should be 4.6 m² (100:90). For flat filing systems, the floor area is 3.2 m² and the aisle space 3.6 m² (90:100, ratio reversed). Flat filing systems cannot hold as much as vertical ones, and high shelf units are hard to organise. Vertical files may reduce staffing levels in the filing section by 40%. Hanging files use wall space 87% better than box files → (15). An efficient way to move files is by paternoster elevator. Workstations should include shelves for sorting, a small table and a chair on castors.

The filing room should be centrally located, and the best window grid module is between 2.25 m and 2.50 m. Since a clear height of only 2.10 m is required, three storeys of filing could be fitted into a space which would only take two storeys in normal offices. Dry storage rooms are essential, and therefore attics and basements are unsuitable.

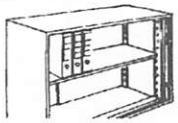
Narrow shelves → (16) and (17) with hanging files and a writing surface can provide a functional connection between workstations. Trolleys can be used either as writing surfaces or for card-index boxes. Movable filing systems give substantial space saving (100–170%) by eliminating intermediate passages → (18)B. There are no fixed standards for filing systems. They are usually adapted to suit individual requirements, such as registries, archives, libraries and storage areas. The increase in load for each square metre of floor space must be taken into account. File shelving may be moved by hand or by mechanical means. In some designs, the entire filing system, or only parts of it, can be locked by one handle.



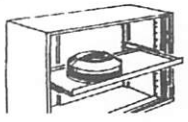
(1) **Cabinet system, series A**



(2) **Series B** → (3) – (10)



(3) **Shelves: usable depth 42 cm; 1.37 m wide**

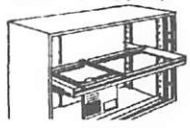


(4) **Pull-out shelf with telescopic runners**

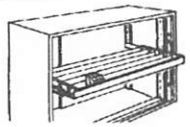
(5) **Rack for magnetic tapes or film (49 separate holders)**

(6) **Pull-out shelf for microfilm cassettes (164 capacity)**

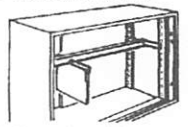
(7) **Pull-out rack for suspended files**



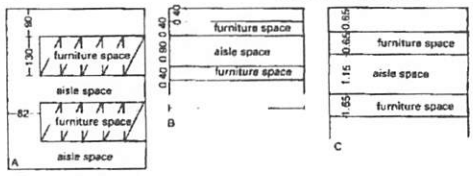
(8) **Rack to hold suspended files parallel to front**



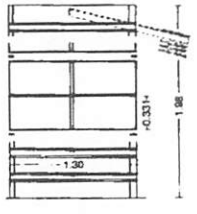
(9) **Pull-out shelf for diskettes**



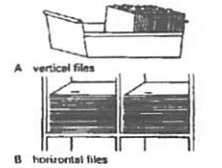
(10) **Supporting rail for centre-mounted suspended files**



(11) **Circulation/furniture areas for various filing systems**



(12) **Large Velox archival shelf (section and plan)**



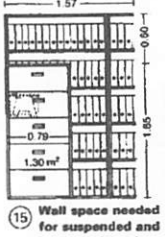
Handling times:
Comparison of flat and vertical files

	flat	vertical
remove file	29%	14%
sort files	41%	66%
replace files	30%	20%
	100%	100%

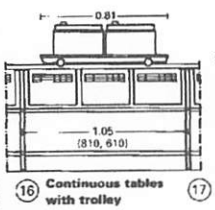
(13) **Filing systems**

		flat filing in loose-leaf binder on open shelves 35 × 200	library storage in letter organiser in roll front cupboard 40 × 125 × 220	combined vertical and suspended filing in folders, units 85 × 78 × 200
10000 files approx. 2 mm thick (without holders); approx. 25 sheets each	1) continuous cabinet or wall length 2) floor area (m²) including operation but excluding side passages	7.25 m 5.62 m²	11.00 m 8.25 m²	7.4 m 3.6 m²

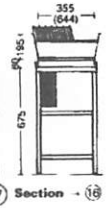
(14) **Space required by different filing systems**



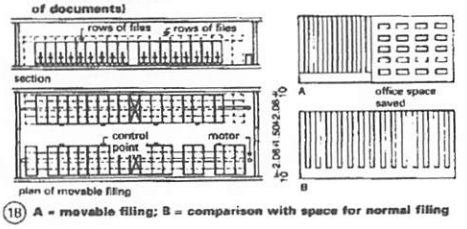
(15) **Wall space needed for suspended and box files (equal nos of documents)**



(16) **Continuous tables with trolley**

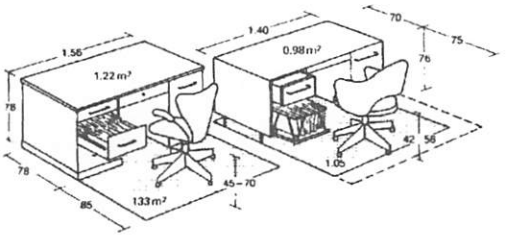


(17) **Section** → (18)



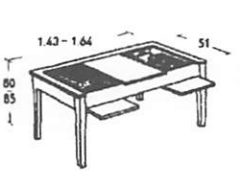
(18) **A = movable filing; B = comparison with space for normal filing**

CALCULATIONS: SPACE FOR FURNITURE

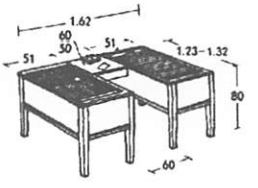


① **Standard writing desk with drawers**

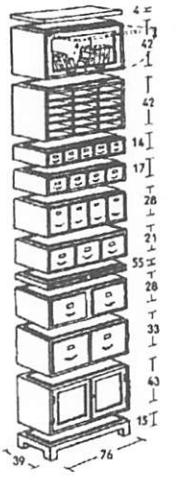
② **Office desk: 0.5 m² less floor space than ①**



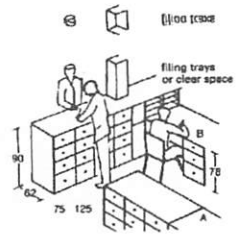
③ **High desk for card index; 1500 cards in each box**



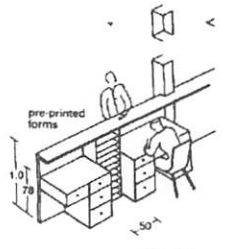
④ ***Double unit*** → ③



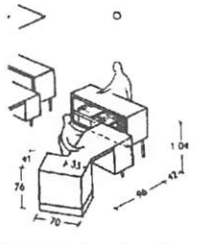
⑤ **Cabinet for storage of various standard size cards and diskettes**



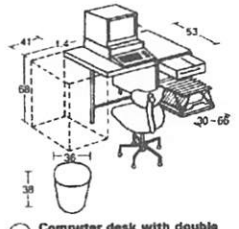
⑥ **Service counter**
A: with passage behind it
B: with adjoining desk



⑦ **Service counter with desk facing clients (Swedish style)**

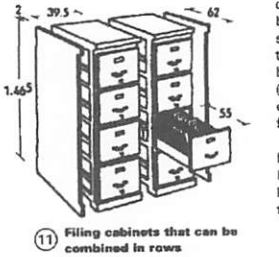


⑧ **Individual counter units; can be separated**

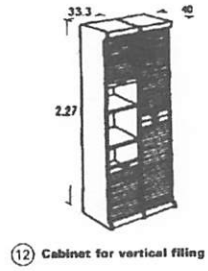


⑨ **Computer desk with double retractable trays (Velox)**

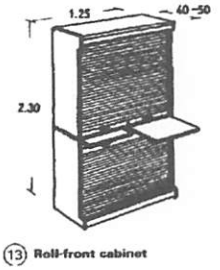
⑩ **Stackable filing cabinets**



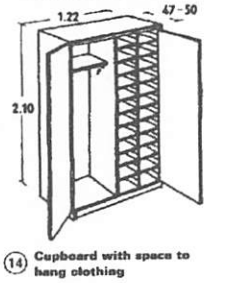
⑪ **Filing cabinets that can be combined in rows**



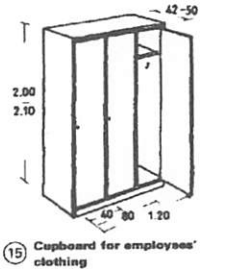
⑫ **Cabinet for vertical filing**



⑬ **Roll-front cabinet**



⑭ **Cupboard with space to hang clothing**



⑮ **Cupboard for employees' clothing**

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.

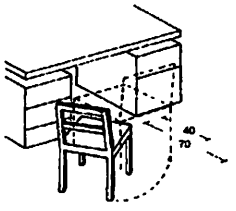
Filing archives and card systems.

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

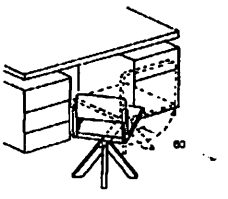
Counters for transactions with a person standing on the other side are generally long, and should be 62cm wide and approx. 90cm high → ⑥. If a counter is only 30cm wide, its height should be approx. 100cm → ⑦. In public areas of a building where high security is required, this makes it difficult for 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.

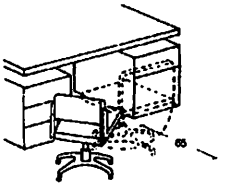
CALCULATIONS: SPACE FOR FURNITURE



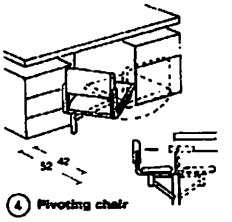
① Traditional chair



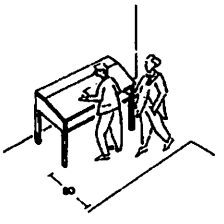
② Swivel chair



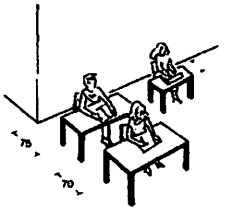
③ Swivel chair on casters



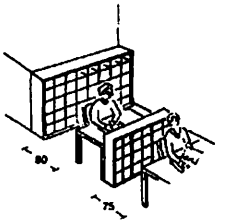
④ Pivoting chair



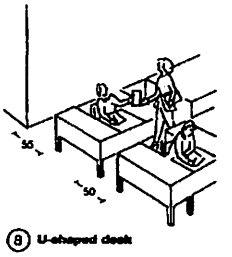
⑤ High desk



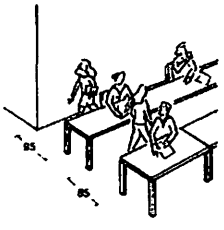
⑥ Individual tables



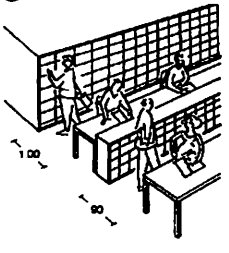
⑦ Individual tables with filing racks to rear



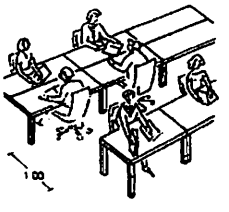
⑧ U-shaped desk



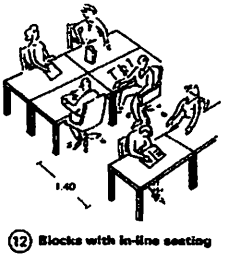
⑨ Rows of tables with circulation behind



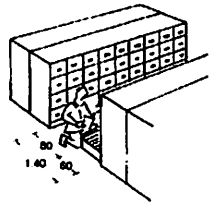
⑩ Rows of tables with filing racks to rear



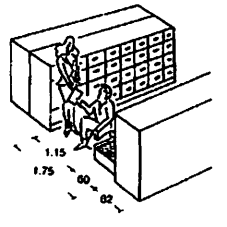
⑪ Rows of tables in blocks with staggered seating



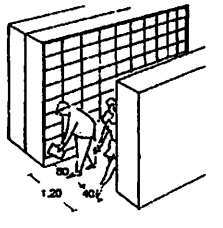
⑫ Blocks with in-line seating



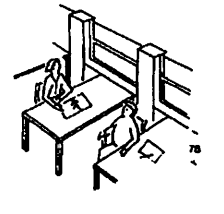
⑬ Filing cabinets



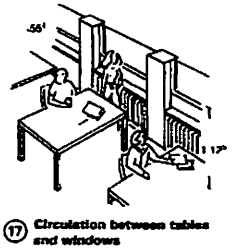
⑭ Filing cabinets with passageway



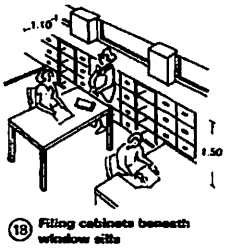
⑮ Pigeon-holes



⑯ Tables connected directly to window sills



⑰ Circulation between tables and windows



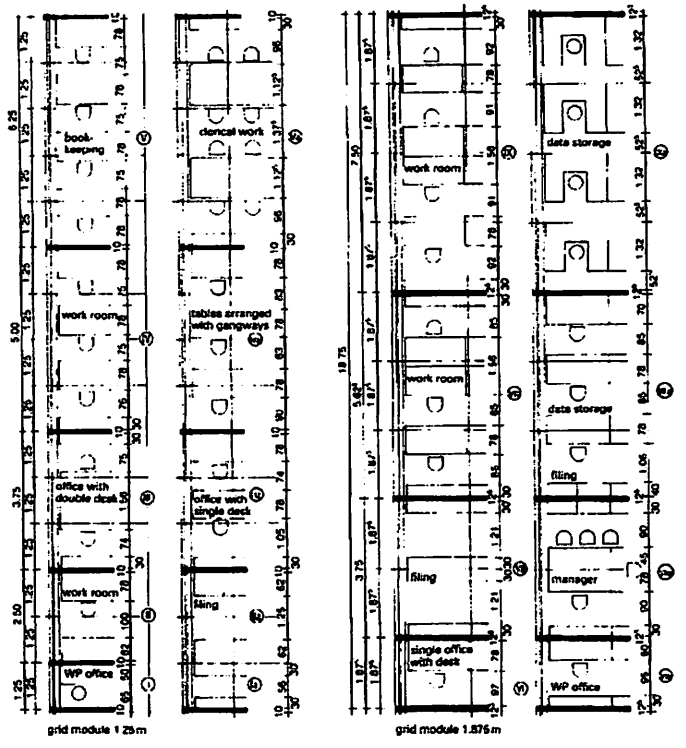
⑱ Filing cabinets beneath window sills

A wide range of office furniture is available. The suitability of furniture for any office is influenced by its flexibility, adjustability, durability, IT compatibility, storage space, ergonomics, aesthetics and cable handling.

The space required while seated and standing is used to calculate the minimum clearance between individual desks or tables (preferably a minimum of 1 m), depending on whether they are placed against walls or other tables, or in front of filing cabinets.

Windows placed high in the wall provide satisfactory illumination deep into the room, which allows efficient use of space and access to the window ledge → ⑱.

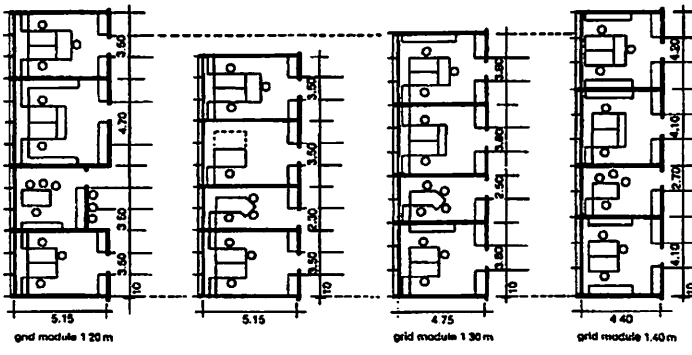
CALCULATIONS: FLOOR AREA REQUIREMENTS



① Minimum room width according to window grid modules

According to standard dimensions relating to the varied space requirements in office buildings, the minimum distance between the centre lines of windows or window columns is 1.25m. The resulting distances between the centre lines of partitions are 2.50m, 3.75m, 5.00m etc. → ① - Ⓥ. These offer considerable choice in positioning furniture, and are flexible enough to fulfil almost every requirement. If a larger module is needed, the spacing shown in ⑪ should be selected.

The largest grid module for office buildings is 1.875m; the figure → Ⓥ - Ⓧ shows some examples of the many efficient ways to position furniture. Beam spacing according to the standard dimensions of 625mm or 1.25m is also suitable for this centre distance, and every third beam will coincide with a façade column.



② Possible arrangement for different window grid modules

Usable floor area is based on the principle of office units arranged in a row along the façade or some variant thereof, with office size determined by rank or function.

user	usable floor area in office
One senior staff member with a need for discretion regarding personnel or social services, or needing to be able to concentrate	approx. 12m²
Two senior staff members (perhaps with seating provided for a trainee) or one employee with a conference table for about four people	approx. 18m²
Manager with a conference table for about six people, or three senior staff members or secretaries, or two senior staff members with additional equipment or a workstation, or a room in front of the Director's office with a waiting area	24–30m²
Section leader's office or functional room containing a great deal of equipment	larger than 30m²

③ Number of occupants for various office sizes

1.20 m grid module

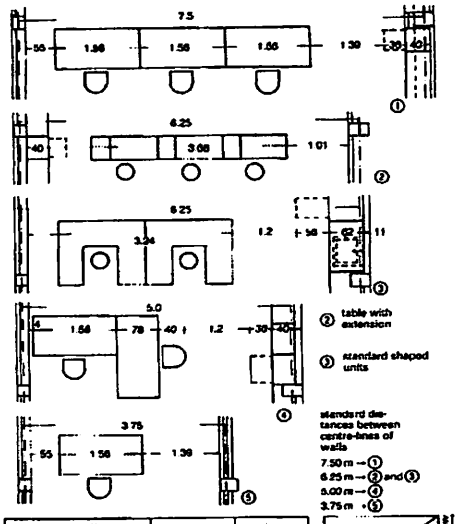
The standard room size of 18 m² (3 × 1.20m less 0.10m for the partition) corresponds to a 3.50m room width, which is too narrow for standard furnishings for two employees (2 × 1.00m clearance plus 2 × 0.80m depth of desk = 3.60m). The two-grid-module room, 2.30m wide, is too narrow for one senior staff member with seating for a visitor. Deeper workstations with video display units and other special equipment require the next largest room (4.70m).

1.30m grid module

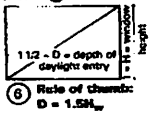
A room 3.80m wide, corresponding to 18m² usable floor area, allows for an additional filing cabinet, two video display stations 0.90m deep, one drawing table or drawing machine and one desk, and one desk and conference table for four people. Such an office is very flexible, and will accommodate workstations of all standard office sizes without any need to move the walls.

1.40grid module

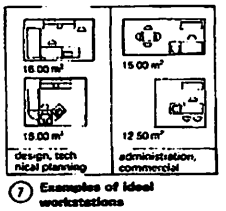
A room 4.10m wide, i.e. 3 × 1.40m less 0.10m for a partition, provides excellent possibilities for furnishing and more flexible use. A room depth of 4.40m, providing 18m² floor area (i.e. 4.10m × 4.40m), is normally sufficient for special uses or greater demands on space. Increasing the room depth to 4.75m increases the usable floor area of a three-grid-module standard room to 19.5m² (i.e. 4.10m × 4.75m).



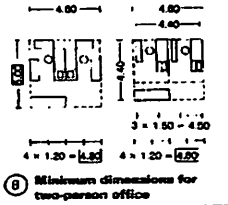
single/group office	normal	maximum
depth of office	3.75 - 7.50 m	9.25 m
dist. between windows	1.00 - 3.25 m	6.00 m
dist. between columns	1.75 - 7.50 m	11.00 m
main corridor width	1.75 - 2.50 m	3.25 m
side corridor width	1.50 - 2.00 m	2.50 m
height of office	2.50 - 4.00 m	5.00 m



⑥ Rule of thumb: $D = 1.5H_w$ + text



⑦ Examples of ideal workstations



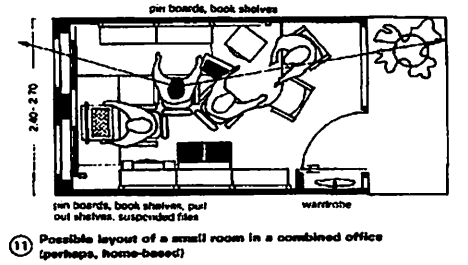
⑧ Minimum dimensions for two-person office

general lighting only	average level (lux)	at work station
corridors, toilets, ancillary rooms	30	-
stairs	60	-
archives	120	250
clerical work, post room, kitchen	250	500
tech. drawing	600	1 000
laboratory		4 000

⑨ Light levels in office buildings

fresh air m³/h/person	to VDI requirements	to ASHRAE guideline
10	non-smoking; heated air when < 0°C outside	
10 27		office space
20 30	non-smoking	
26 34		
30 40	smoking	
34 - 51		smoking exec. office
51 68		

⑩ Typical ventilation requirements



⑪ Possible layout of a small room in a combined office (perhaps, home-based)

CALCULATIONS: FLOOR AREA REQUIREMENTS

Office area requirements are calculated in two parts.

(1) People space is calculated as (standard individual space × number of people) + allowances for immediate ancillary needs + a factor (usually 15%) for primary circulation.

(2) Non-people space (e.g. machine rooms, and libraries and the like for which fittings and equipment sizes are more important than staff numbers in setting the area requirement) should be calculated by informed estimates based on existing good practice or comparable examples + an additional factor for primary circulation.

Figures for the average floor area requirement for each workstation and employee in an organisation (including office equipment and space to operate it), not including management, have roughly the following distribution:

30%	3.60–4.60 m²
55% (average 8.5 m²)	7.00–9.00 m²
15%	>9.00–15.00 m²

The space requirement per employee clearly depends on a number of factors, e.g. type of work, use of equipment and machinery, degree of privacy, level of visits made by outsiders and storage needs. The average workstation floor area requirement until 1985 was 8–10 m²; in future it will be 12–15 m². Although a minimum floor area requirement for office workstations has not been defined, the following guidelines should be followed: separate offices, minimum 8–10 m² (according to the grid module); open-plan offices, minimum 12–15 m².

A representative calculation of the space requirement for a workstation is as follows:

work room, min. 8.00 m² floor area;
free circulation space, min. 1.5 m² per employee, but min. 1 m wide;
surrounding volume of air, min. 12 m³ when most work is done while seated, min 15 m³ when most work is done while not seated.

The following floor-to-ceiling heights are recommended for floor areas of:

up to 50 m²	2.50 m
over 50 m²	2.75 m
over 100 m²	3.00 m
over 250 and up to 2000 m²	3.25 m

An American study (Connecticut Life Insurance) indicates the following requirements for floor area and space to operate office equipment (personal floor area + an additional 50 cm on all sides):

office employee	4.50 m²
secretary	6.70 m²
departmental manager	9.30 m²
director	13.40 m²
assistant vice president	18.50 m²
vice president	28.00 m²

The depth of a room depends on the space required for an individual in a multi-occupant, open-plan, group or office room. The average depth of office space is 4.50–6.00 m. Daylight illumination reaches work workstations to a depth of approx. 4.50 m from the window (depending on the location of the office building, e.g. in a narrow street or in an open area). Rule of thumb: $D = 1.5H_w$, where D is the depth of light penetration and H_w is the height of the window head (e.g. H_w = 3.00 m, D = 4.50 m). Workstations located in the deepest third of the room require artificial light. Working groups often have to do without daylight penetration, since they may be allocated to deeper rooms if that is required by the building layout.

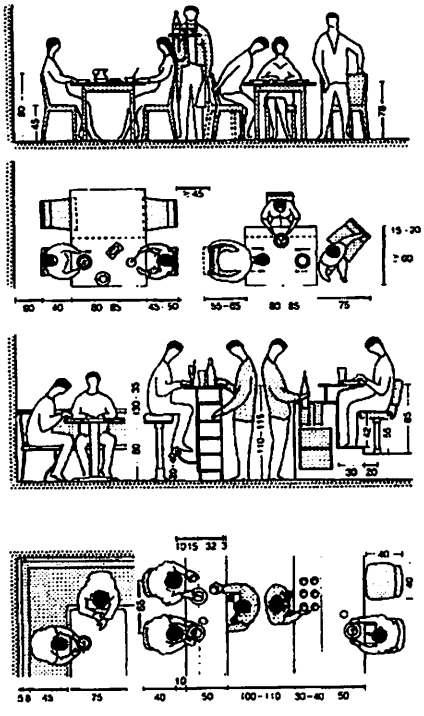
The width of corridors depends on the occupation of the space and the area required to move equipment. Generally speaking, it should be possible for two people to pass each other.

RESTAURANTS: SPACE REQUIREMENTS

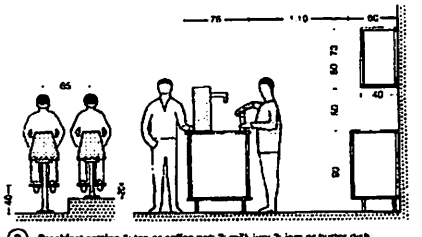
(See also pp. 255–6)

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

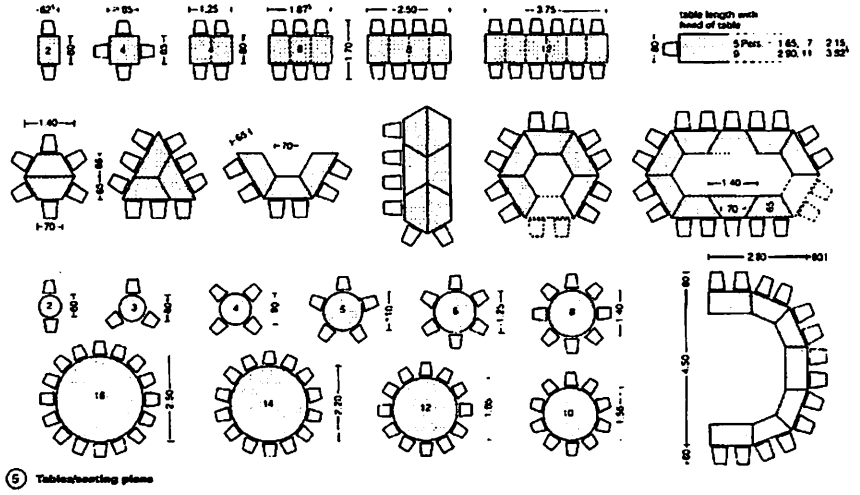


② Breakfast setting 1: tea or coffee pot; 2: milk jug; 3: jam or butter dish; 4: sugar basin; 5: fork; 6: knife; 7: teaspoon; 8: plate; 9: serviette, 10: saucer, 11: tea or coffee cup

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: entree fork; 2: fish fork; 3: dinner fork; 4: soup spoon, 5: dessert spoon; 6: dinner knife, 7: fish knife; 8: entree knife; 9: soup dish, 10: dinner plate; 11: serviette; 12: turnbler; 13: wine glass; 14: liqueurglass

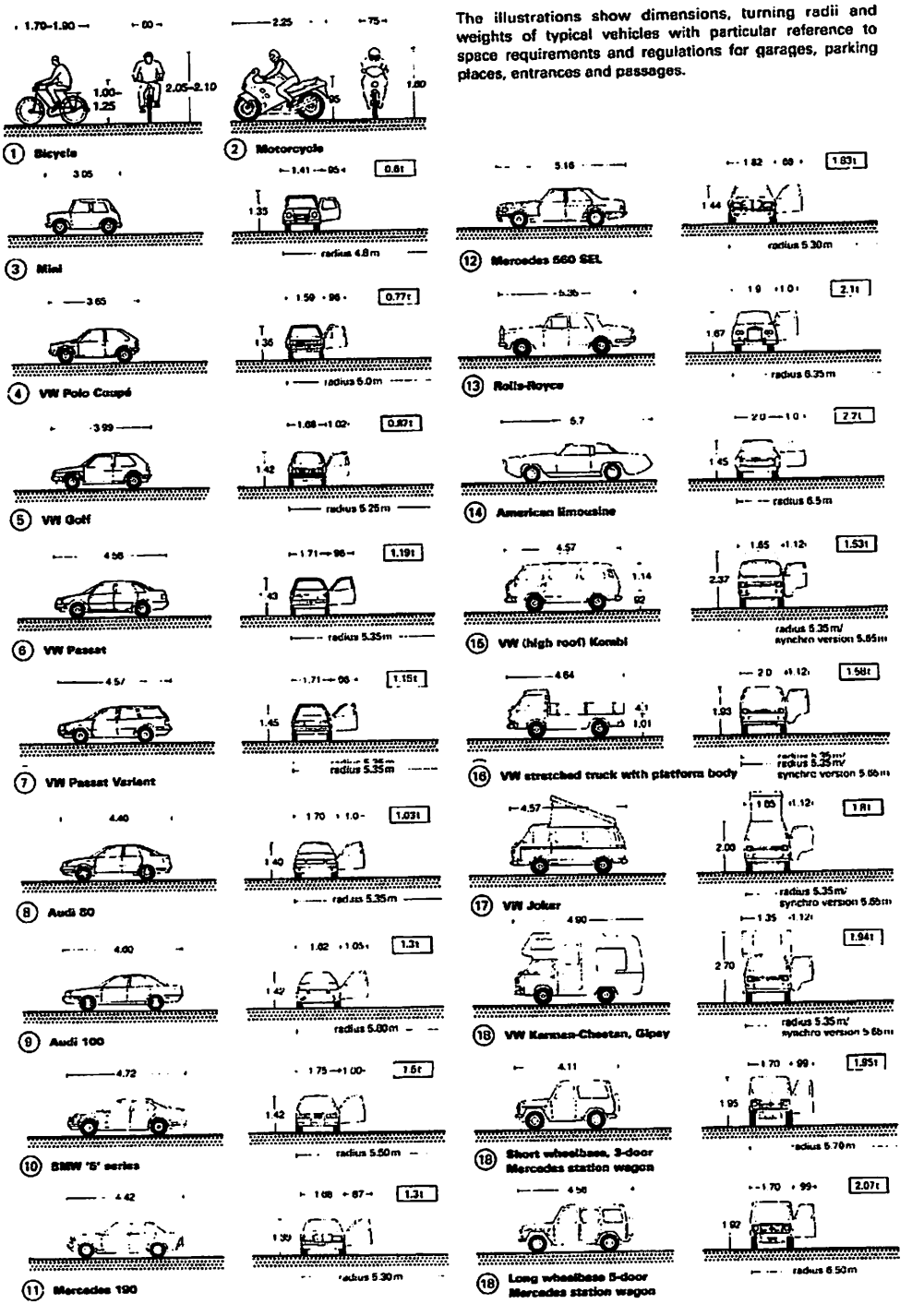
② Breakfast ③ Luncheon ④ Banquet



⑤ Tables/seating plans

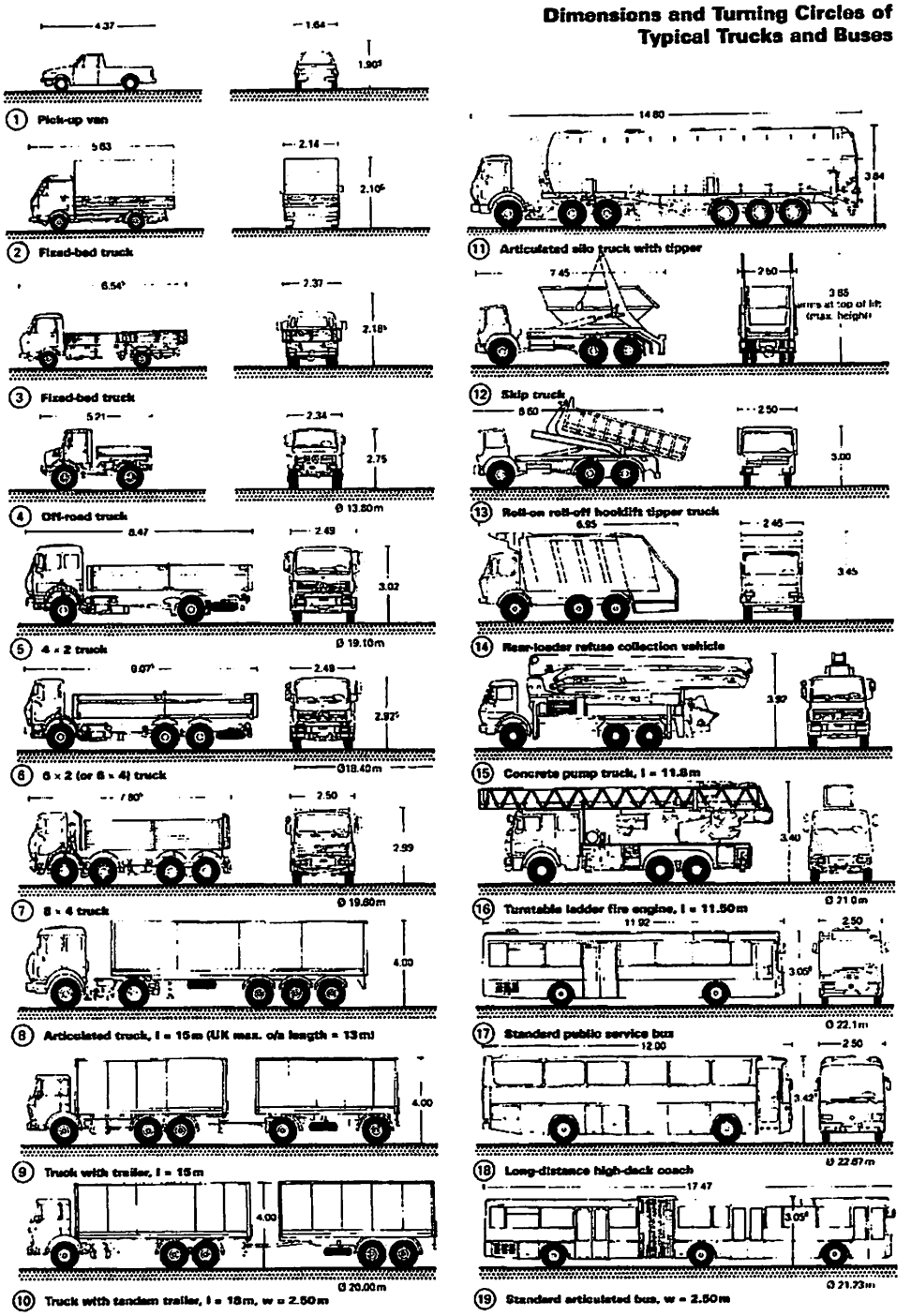
VEHICLE DIMENSIONS

The illustrations show dimensions, turning radii and weights of typical vehicles with particular reference to space requirements and regulations for garages, parking places, entrances and passages.



VEHICLE DIMENSIONS

Dimensions and Turning Circles of Typical Trucks and Buses



PRIMARY

Basic teaching areas

A base is required for every class or group of children within the school, whether in the form of an enclosed classroom, or as part of a more open-plan area. It must be large enough to gather at least 30 pupils together for registration, listening, discussion and for whole-class teaching. An area of at least 35 m² is likely to be needed for adequate table space for every pupil, whether arranged in groups or rows, and the teacher's workstation. Other basic ingredients for class teaching include:

- free floor space, for gathering pupils together and for space-consuming work
- a book corner with room to browse
- computer workstations
- facilities for practical work.

Many teaching activities can also be carried out in shared areas which can, if designed carefully, accommodate different approaches to teaching and foster collaboration.

	likely maximum group size	*typical average area (m²) or no. of rooms**	*no. of spaces or total area required* 210	420
classroom	30	54	7	14
small group room	8	12	–	1
small group/SEN support	15	16	1	1
medical inspection/group room	8	10	1	1
studio	30	45	–	1
main hall		1*	145 m²	155 m²
specialist practical including food	8	20	1	3
library	8	1	18 m²	36 m²
total teaching area			*587 m²*	*1090 m²*
admin office		10	1	1
headteacher's office		12	1	1
senior management office		8	–	1
staff/parents'/meeting room		1*	29 m²	42 m²
staff/visitors' and disabled toilets (area/fitting)		3.5	2	4
classroom stores		2.5	7	14
hall PE store		10	1	1
external PE store		5	1	1
drama/music store		6	1	1
central stock room/secure store		6	1	1
pupil toilets (area fitting)		2.5	11	21
classroom dock bays		4	7	14
kitchen servery (and kitchen staff and storage)		1*	35 m²	50 m²
caretaker's store		1*	5 m²	10 m²
cleaner's store		1.5	2	4
plant room/intakes		–	28 m²	44 m²
circulation and partitions			180 m²	325 m²
total gross area			*996 m²*	*1781 m²*

17 Typical schedule of spaces for a 5–11 primary school

The design of basic teaching accommodation can vary from a collection of entirely self-contained classrooms to a more open-plan system with a high proportion of shared areas and small class bases. Each approach can work well as long as they meet the school's current needs and are flexible enough to allow for changes in the future. An 'enclosed' approach has self-contained classrooms offering a reasonable range of activities. For 30 pupils these would be expected to be in the range of 54 m² to 63 m². An enclosed room allows the teacher to monitor pupils more closely and provides more autonomy and privacy; however, there is less opportunity for co-operation and shared supervision. Another approach is to have 'semi-open' class bases that open onto a shared area to support a variety of teaching methods, though it should be possible for teachers to screen off class bases when more privacy is required. Such arrangements can also give easier access to shared resources and facilities. At the opposite extreme, an 'open-plan' base approach will rely on screens and furniture to create any form of enclosure for each class.

Timetabled supplementary areas

Accommodating specialised facilities in supplementary areas (such as practical areas, studios or small group rooms) can be an efficient use of space and resources.

Subjects which contain a practical element, such as science, technology and art may take place in a specialist practical area. These areas provide opportunities for sustained and often large-scale work, and can be equipped for different activities, from scientific experiment and control technology to cookery and ceramics. Ideally, a specialised cookery space should be fitted out with kitchen furniture of an appropriate height for the age range. Ovens and microwaves can be provided at a height that enables children to watch and participate. A ceramics area should be placed in a self-contained bay or separate room to prevent clay dust contaminating other teaching areas. In addition, an area for wet or messy activities, with a deep sink and suitable floor finish, may be required. A dry practical area for work such as making and testing should have sufficient power points, appropriate furniture (e.g. fixed worktops and workbenches) and access to a range of practical resources. Pupils often prefer to stand to do practical activities, so workbenches should be higher than tables.

A small group room can be used for withdrawing individual pupils or small groups from a class, and can also be used for independent study. Music, drama, movement and dance benefit from a specialised environment with acoustic isolation, 'dim-out' facilities and some stage blocks. In larger schools this could be accommodated in a separate studio but in smaller schools a hall may be suitable if there is appropriate storage space. Most primary schools have a hall for large group activities, such as assemblies and PE, some drama, music, and often for dining. Ideally, the hall should have a range of PE apparatus (both fixed and loose), space for loose apparatus to be left out during the day, and stores for loose PE equipment.

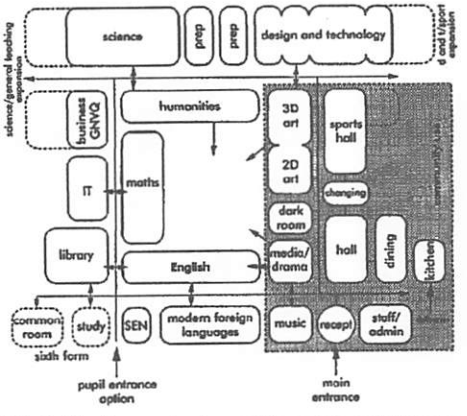
SECONDARY SCHOOLS

Staff accommodation

In a typical secondary school today, staff accommodation will include offices for senior teaching staff, some small, local departmental staff work rooms and a central staff room providing work space for the remaining staff and a social area for all teaching staff who wish to use it. The main staff room should preferably be secluded from noisier parts of the school, but centrally located.

Timetabled teaching areas

The secondary school curriculum is normally taught in distinct subjects, using a variety of timetabled teaching rooms which tend to be used predominantly for one subject. Almost half the subjects taught in secondary schools are 'general teaching', normally only requiring standard classrooms. These subjects include English, mathematics, modern foreign languages (MFL), humanities (history and geography), religious education, personal and social education (PSE) and general studies. The remainder usually require specialist spaces which are less likely to be interchangeable, although art and graphics or music and drama may share spaces. IT rooms will be required as a timetabled and bookable resource for most subjects, particularly business studies, GNVQ, MFL, humanities and design and technology.



24 Bubble diagram showing possible arrangement of spaces and activities in an 11–16 (11–18) secondary school (design and technology includes multi-materials, pneumatics, electronic and control technology (PECT), textiles, food and graphics)

Size, shape and layout The size, shape and layout of individual teaching rooms should provide a space which has the flexibility to accommodate a broad range of activities. Keeping fixed furniture and equipment to the perimeter and loose furniture to the centre is recommended. A space which is too narrow may restrict the range of activities and the possible furniture layouts (see pp 40–41), particularly in practical spaces where there may be large items of equipment with minimum space requirements

	likely maximum group size	*typical average area (m²) or no. of rooms[a]*	*no. of spaces or total area required* 600	900	1200
timetabled teaching					
general teaching					
standard classroom	30	50	12	17	22
large classroom	30	62	3	4	6
IT room	30	72	2	3	4
science laboratory	30	84	5	7	9
design and technology					
food room	21	85	1	1	2
multi-materials workshop	21	100	1	2	2
pneumatics/electronics/ control/tech	21	88	1	1	2
textiles (dry, including sewing)	21	84	1	1	1
graphics	21	78	–	–	1
art					
general 2D art room	30	90	–	1	1
3D art (incl. ceramics kiln if req'd)	30	105	1	1	1
wet textiles and 2D art	30	105	1	–	1
music room	30	65	1	2	2
drama studio/music recital room	30	90	1	1	2[c]
gymnasium	30	260	1	–	–
sports hall	30	594	–	1	1
non-timetabled teaching					
assembly hall	–	–	240[b] m²	240[c] m²	260[b] m²
SEN classroom	6	22	1	1	1
music group/practice rooms	5	6	3	6	6
music ensemble room (or recording studio)	7	20	1	2	2
small group room	3	6	1	1	1
heat treatment bay	4	16	1	1	1
food technology/testing area	5	15	1	1	1
kiln room or dark room	4	10	1	1	1
IT cluster/resource area	8	24	1	2	3
library resource centre	10% of NOR	1[a]	128m²	155m²	182m²
total teaching area			*2831m²*	*3956m²*	*5087m²*
non teaching areas					
dining areas	–	–	180m²	232m²	270m²
kitchen (incl. staff and stores)	–	–	90m²	116m²	135m²
lockers for personal storage		0.1	450	675	900
pupils' toilets (area per fitting) (area per locker)	–	3	29	43	57
changing facilities incl. showers	1 year group	–	60m²	90m²	120m²
science prep/store room	–	1[a]	64m²	89m²	115m²
multi-materials prep room	–	1[a]	46m²	48m²	52m²
walk-in teaching stores:					
general teaching/SEN/IT	–	2.5	40	47	56
off practical spaces	–	6	13	15	24
music and external	–	10	2	3	3
PE equipment	–	25	1	2	2
head's office/meeting room	–	24	1	1	1
senior management offices	–	8	6	7	8
librarian/SEN offices	–	12	2	2	2
admin/secretaries/reception	–	–	32m²	48m²	63m²
staff room (social)	–	–	32m²	48m²	63m²
staff work room(s)	–	–	40m²	60m²	75m²
reprographics	–	–	12m²	18m²	24m²
staff changing rooms	–	–	4m²	4m²	4m²
staff toilets (area per fitting)	–	3.5	6	8	11
central stock/exam store	–	5	2	3	4
MI room	3	12	1	1	1
cleaner's stores	–	1.5	4	6	8
caretaker's office/maintenance store	–	–	20m²	25m²	30m²
plant	–	–	60m²	85m²	110m²
corridors/circulation	–	–	760m²	1065m²	1320m²
internal partitions	–	–	120m²	167m²	212m²
total gross area			*4842m²*	*6669m²*	*8479m²*

a: 1 of each; b: partially timetabled for PE; c: partially timetabled for drama

25 Typical schedule of spaces for an 11–16 secondary school

Plumbing

Hot and cold water services and drainage will be required for all sanitary installations, cleaners' cupboards, tea kitchens, vending, restaurant and café areas. Some facilities in specialist organisations, such as laboratories, may also require sanitary provision, as will any day-care, health or fitness facilities. Taller buildings require protected risers for fire fighting.

For both single sex and unisex toilets, provision can be calculated at 1 person per 14 m² NIA, based on 120% of the population (60%:60% male-to-female ratio). Where toilets are unisex, the calculation is based on 100% of the population. However, to provide for maximum adaptability over time, higher occupancy rates and differing gender balances are worth considering.

Water storage is calculated as 10–20 litres per person per day, to reduce the risk of Legionnaires' disease through keeping the turnover high.

Lifts and escalators

The positioning of lifts and their lobbies, and their number and speed can be critical to how staff and visitors perceive the building. Lifts should move a minimum of 15% of the building's population within 5 minutes, with a maximum wait of 30 seconds and an actual car capacity of 80%.

For any building over 10 000 m² a separate goods lift is essential(with ease of access at all levels for bulky objects). Fire fighter's lifts may well be needed for high buildings.

Escalators can carry large numbers of people quickly, but they are expensive in terms of both money and space. They are thus generally only used in high-profile situations, such as to enter a first-floor office area from the street or to move large groups through a higher space.

SETTINGS

Furniture, fittings and decorative items are all included in settings.

Furniture, the primary element, should function well, look good, and be durable and replaceable. It must be also be possible to procure the specified items within the given timeframe. Testing out alternative workstations and chairs can prove a useful exercise.

European legislation now makes clear demands concerning the provision of suitable workplace design where VDUs are involved. Since nearly all workers in Europe now use VDUs for at least part of their working day, the relevant Directive covers the majority of workstations.

VDU Directive

EEC Directive 90/270 covers most aspects of workplace design associated with VDUs. It calls for:

- clear and controllable screen images
- movable base to the screen
- adjustable keyboard height and angle
- document holders
- adequate sized work surfaces
- low-reflectance surfaces
- stable and adjustable chairs
- footrests
- avoidance of glare and other environmental discomfort factors
- eye tests
- training in the use of equipment.

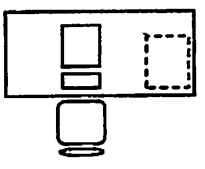
Workstations (see 22)

Workstations should be designed to provide maximum comfort. Adjustable height work surfaces are not obligatory, but common sense dictates that two people of quite different heights should not be forced to use the same height work surfaces. However, where desks are shared, heights are unlikely to be adjusted between occupancy by different users (though this does depend on the ease of adjustment). Adjustability to standing height is being adopted by many firms, particularly on the continent.

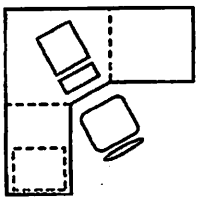
For general computer work, a boomerang shaped work surface can work well. The keyboard is positioned directly in front of the screen, with surfaces for reference material easily accessible on either side. Where alternative work settings are provided, minimum size workstations may prove adequate.

The classic 'systems furniture' workstation consists of one or more work surfaces, perhaps a movable table element for meetings, space for personal and business storage, screening which may be used as pin-up space, and a cable management system.

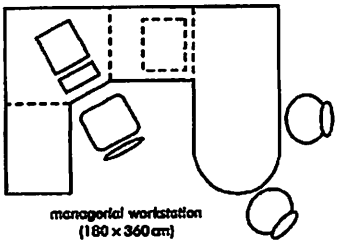
More mobile workstations may be made up of furniture which is configured to fit immediate needs. Alternatively, built-in workstations or standard elements put simply together may prove effective and economic.



minimum workstation (160 x 160cm)



maximum general workstation (160 x 160cm)



managerial workstation (160 x 360cm)

22 Typical workstations

Chairs (see 23)

A good chair is central to worker comfort. The VDU Directive requires that VDU operators be provided with fully adjustable chairs. The back and seat must be independently adjustable, as should seat(pan) and arm height. For those doing non-VDU centred tasks, seating is still important, though this will depend on length of use.

The occasional-visitor chair can be fairly basic, as can the seating in reception – though this should look good and not be too low. However, seating for meetings should be comfortable enough for several hours' use. This also applies to restaurant seating where it is also used for working, but it should be exceptionally durable and easily cleaned.

Storage (see 24)

Storage may be personal, group or general, and the amount and type will vary depending on business sector and department. It could be heavy, bulky or confidential, and may or may not require easy access. The more storage can be rationalised, the more flexible the organisation can become.

At the workstation, personal storage is needed for items including brief cases, handbags and other incidentals. Storage for stationery, small equipment, files and some reference material is also required within easy reach of the seating position. With shared desking, mobile pedestals, trolleys, bags or some other system should be provided, plus designated storage which is both neat and safe.

Groups require secure and tidy storage for coats and umbrellas. Space for reference material and files will also be needed, but in preference the majority of this is in a central resource centre.

Main storage areas include space for core business items, such as stationery and files (though dead files may well be stored off-site). Facilities management requires storage for housekeeping stores, cleaning equipment and materials.

Material may be accommodated on shelves, in cupboards or filing cabinets (vertical or horizontal). Bulk storage systems (sliding or revolving) can store large quantities of files and other information.

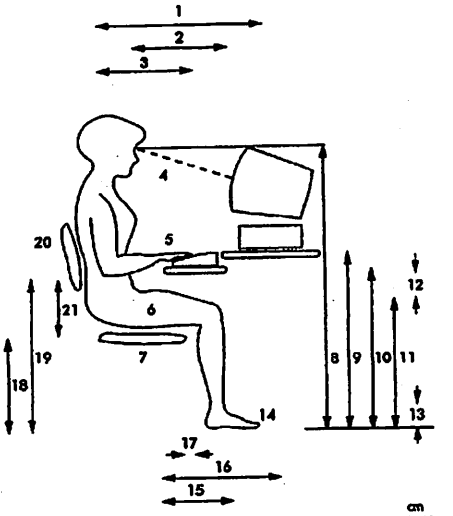
Paper storage

The average amount of paper storage per person varies from the academic at 12–15 linear meters to the mobile or space conscious groups at 0.5–2 linear meters. The average allowance in many businesses is 3–4 linear meters, though many staff use as much as 15 linear meters.

Capacities

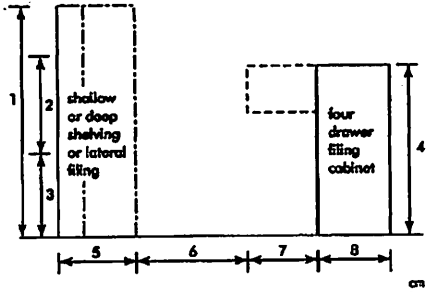
The capacities of different storage systems in linear meters are:

Two-drawer filing cabinet	1
Cupboard/shelving four rows high	4
Revolving	11
Moving aisle	5.5
Revolving	50



		cm
1	arm reach	40–60
2	distance to screen (more for large screens) plus document holder	50–75
3	elbow to keyboard reach	30–40
4	working angle from horizontal eye level to centre of screen	20–30°
5	neutral forearm and wrist angle	5–30°
6	open trunk to thigh angle	90–100°
7	adjustable seat (±5° from horizontal forwards and backwards)	40w x 36h x 40d
8	eye height to top of screen	100–140
9	general worktop height	65–76
10	keyboard height (rounded edges and wrist supports)	65–76
11	under desk knee clearance	50
12	clearance between thigh and work surface	20
13	under desk foot clearance	25
14	feet in firm contact with floor or footrest	
15	clearance for knees beneath desk	40–45
16	clearance for feet beneath desk	60
17	clearance between calf and front of seat	4–8
18	seat (pan) height	35–50
19	relaxed elbow height	55–75
20	seat back adjustable in height and angle (and position of lumbar support)	
21	armrest height above seat (adjustable and set back from seat edge 10cm)	20–25

23 Workstation ergonomics: average dimensions



		cm
1	maximum reach (for the average woman)	195
2	optimum shelving zone (for storage of heavy items)	75–80
3	low zone, easy reach	70–75
4	maximum height for seeing into a drawer	140
5	depth of shelving	30–60
6	aisle width (allowing for door opening)	90–120
7	clearance for filing drawer to open	45–75
8	filing cabinet	50–80

note: lateral storage has twice the capacity of filing cabinets, so floor loadings need consideration

24 Dimensions for storage

RESTAURANTS AND CATERING FACILITIES

F. Lawson

INTRODUCTION

The traditional divisions between formal restaurants, snack bars and pubs are now almost irrelevant as marketing trends dictate that many establishments are now given specific themes and cater for a particular sector of the market. In addition, following a general trend in the USA and as a result of time pressures in business life, many people wish to spend less time eating but this has not necessarily meant a deterioration in the quality of food offered. As well as moves towards themed restaurants and an expanded choice of cuisines from around the world, there has been huge growth in wine bars and coffee bars, generally also geared to specific markets.

Catering facilities are usually required in work-places and other institutions (factories, offices, schools, hospitals) but there is also increasing provision for eating in the leisure and retail market (i.e. restaurants and bars linked to shopping, sports and entertainment centres).

PLANNING FACTORS

Location and type of provision must be related (e.g. for shoppers in a retail area, tourists in historical settings, business entertainment in commercial centres, casual passing trade in the high street).

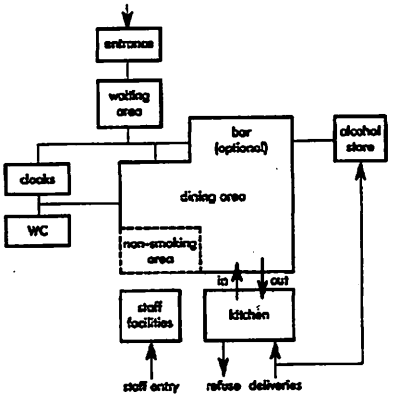
Public access must look inviting and be separate from service access and waste disposal. Similarly, the exterior appearance should communicate clearly, with signs, lighting and menu displays, and convey an image of cleanliness. From outside, people should be able to view the interior seating, style and features (e.g. theme or ethnic origin). Each type of restaurant needs a different identity.

Branding now plays a key part in catering for specific types of customer (e.g. exclusive, family, vegetarian) although the image needs to be reinforced through known menu, quality of food and service, etc., to ensure repeat custom. Detailed analysis of consumer trends is essential.

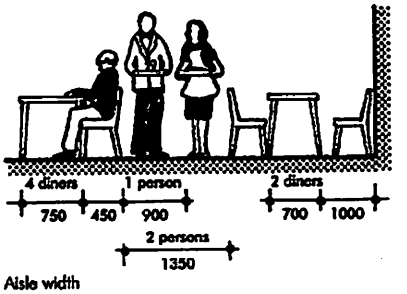
The interior should create a good impression and a suitable atmosphere. Comfort should be related to the cost of the meal and length of stay, which will influence seating, furnishings, decorations, lighting, noise level and toilet facilities. Unconventional spaces can produce enjoyable surroundings (e.g. old cellars and warehouses). Note that period between refurbishment is usually quite short: about 7 years, or 4–5 years for fast-food and speciality restaurants.

Ambience is an important factor in restaurant design. Large regular spaces should be broken up into smaller more intimate areas, if necessary by screens or decorative features. Changes of level are not usually favoured by caterers but are acceptable providing they make a positive contribution to design, do not involve more than two or three steps, and the main part of the restaurant is on the same level as the kitchen. Raised seating areas should be protected by balustrades. Many customers prefer a table at the side of a room, or in an alcove, rather than the central area; group bookings may require a more central position. The cash desk may be at the entrance, by service doors or within the kitchen area, depending on the management system.

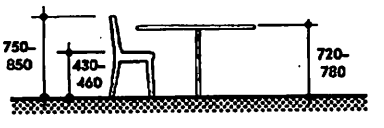
For the highest quality restaurants, the initial impression is very important, requiring sufficient seating/table space and privacy. A bar is probably essential because customers often study the menu before being seated and the food preparation will probably take longer. Adaptability may be needed (e.g. partitioning to create a separate function area) and a change of atmosphere between lunch and evening may be important, which could require changes to the seating layout.



1 Diagrammatic layout



2 Aisle width



3 Chair and table heights

Lighting The choice of lighting is very important in creating an atmosphere that can be varied to suit different times of day or different customers and menus. During the day, it should be at a higher level and spread more generally, whereas at night there should be lower background lighting with individual table lights.

Guide to lighting levels:

restaurant	50–100 lux
lounge and bar	100 lux
reception	400 lux
corridors etc.	100–200 lux

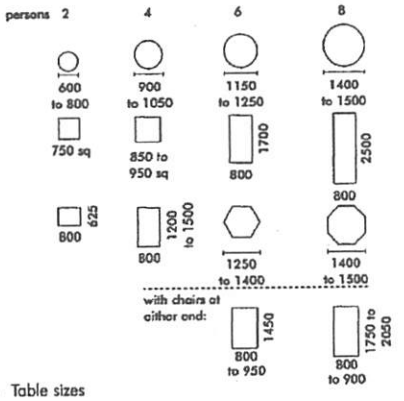
Use classes Restaurants and takeaway premises in the UK are planning class A3 (food and drink for consumption on the premises, or hot food for consumption off the premises). Cafés and coffee bars etc. are usually planning class A1 (shops, including sales of sandwiches and cold (not hot) food for consumption off the premises). Therefore, cafés opening in shop premises do not require planning permission for change of use. Class A1 restrictions are poorly defined in law so they are usually negotiable: 80% takeaway service is often required, with only coffee and other non-alcoholic drinks on sale and food restricted to cakes and pre-prepared snacks etc., which must not be prepared on the premises. Class A3 permission is often much harder to obtain than class A1, and requires much greater provision (e.g. in WC and staff facilities), which necessitates larger premises but no greater sales potential.

Interior planning

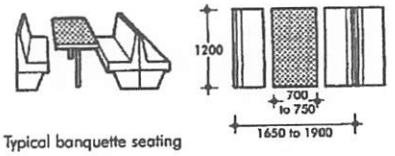
Relationship of main elements The layout and relationship between different areas is dependent on the type of facility. Despite separate functional requirements, all elements (customer area, food preparation area, and counter or – in exclusive restaurants – interface with waiter) are interdependent and must be successfully integrated. Customer circulation should be planned so that there cannot be any confusion with service access and there should be an acoustic lobby between service doors connecting the restaurant and kitchen. The kitchen and preparation areas will equal about 50% of the dining space and ancillary and storage will be about 1.5–2 times the kitchen area. Any reduction in kitchen area tends to reduce efficiency and speed of service.

Customer requirements Include a menu display near entrance, sheltered entrance and an internal waiting area. There must be clarity in organisation between self-service, fast food, etc., and a separate smoking area.

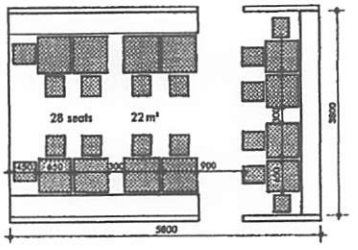
Seating Restaurants should be planned so that a variety of seating arrangements is possible (e.g. tables for two and four, which can be placed together to give six, eight and ten places). Banquette or booth seating (*5*) can be considered but should be supplemented by normal tables to give flexibility. (*7*) shows typical table and counter layouts and local densities. Service aisles (*6*, *7*) should be 900mm (minimum) to 1350mm wide if used both by trolleys and guests.



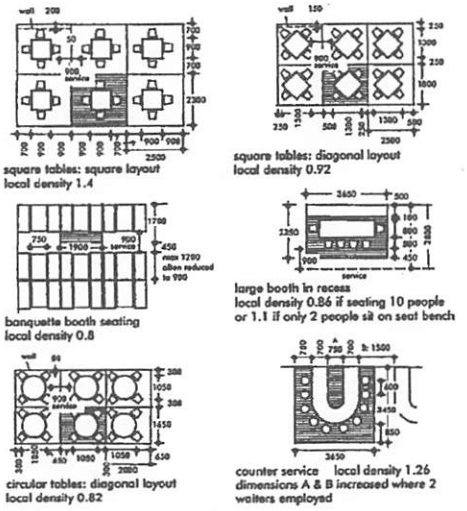
4 Table sizes



5 Typical banquette seating



6 Minimum layout for part of restaurant: local density excluding main circulation and waiter stations and service areas



7 Layout arrangement and densities

Waiter stations Located so as not to disturb the guests, the number will vary according to the standard of service. As a guide, use the following:

restricted menu 1 waiter/waitress per 12–16 covers
typical menu 1 waiter/waitress per 8–12 covers
à la carte/de luxe 1 waiter/waitress per 4–8 covers

Provide head waiter stand in à la carte or de luxe restaurants.

Bars

Traditional and speciality restaurants frequently have aperitif bar for waiting customers and pre-meal drinks. These should be planned so as to allow the head waiter to take orders and call forward customers when tables are ready. Other types of bar include: roof top, pool side, beach, club areas. Bars need to comply with licensing laws.

Cocktail or aperitif bar If required, these should provide a comfortable intermediate waiting area between the entrance lobby and restaurant. Service may be by waiter so a long bar counter might not be required.

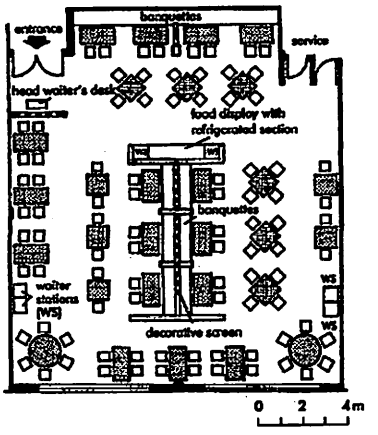
Main bar To encourage business from non-diners the main bar may have an external entrance. A fairly long bar counter supported by bar store with ice making machine and bottle cooler should be provided. The means to shut all bars securely during non-opening hours must be included, either by grill or shutter at the bar counter or by closing the room. The former has the advantage of allowing the room to be used as a lounge when the bar is closed. It should be possible to service bars without passing through public rooms. Space allowance for bars excluding counter:

cocktail lounge (comfortable)	1.8–2.0 m²/person
general bar (some standing and on stools)	1.3–1.7 m²/person

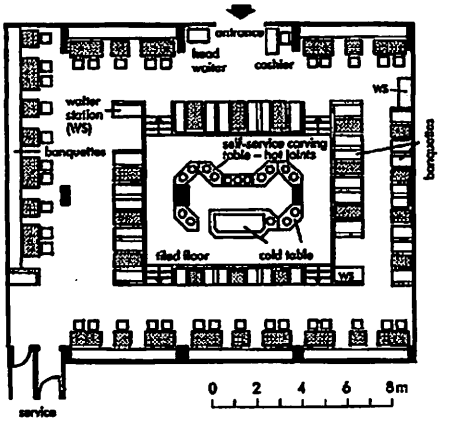
Cloakroom 0.04 m²/person. Probably unnecessary in a small restaurant or café, cloakrooms should be provided in higher quality restaurants, and are essential in function suites. Adequate security is essential: an attendant and ticket system may be necessary. Provision must allow customers to depart quickly after an event.

Furniture/equipment stores Allow 0.14 m²/person.

Other requirements Provision for dancing and live entertainment may need to be considered. A timber dance floor can be included either as a permanent area or one covered with carpet and used for other purposes. Timber floors require regular and careful maintenance. Allow 1.0–3.5 m²/couple. For live music, allow 1.5–2.0 m²/performer (more if a piano is needed), plus space for audio equipment and speakers etc.



8 Traditional restaurant: 110 seats



9 Restaurant seating 124 with self-service carving table

RESTAURANT TYPES AND SPACE ALLOWANCES

Traditional restaurant (8)

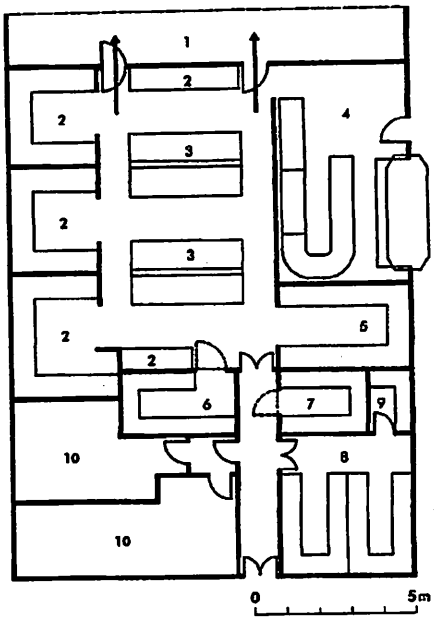
1.3–1.9 m²/person, according to type of business; formal atmosphere, with waiter service. There should be space for display table (e.g. flambé work) and the menu will include table d'hôte and à la carte. Tables will usually be for two persons with generous seating and spacing.

Carvery restaurant (9)

1.6 m²/person, including space for the carving table. The display table has hot and cold positions for self-service of joints, vegetables and sweets. Preparation, cooking and wash-up is done in the main kitchen.

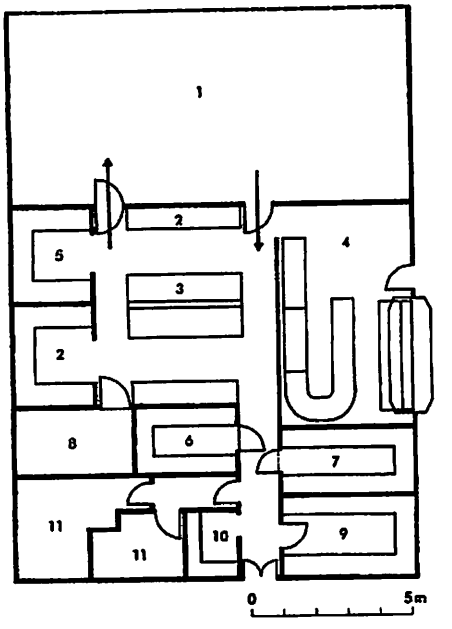
Speciality/themed restaurant (10, 11)

2.0 m²/person, but space requirements can vary widely. Special decorative effects and furnishings are required to reflect dining theme; usually a specific menu. There may be display cooking, grill and dance floor, and probably a bar.



1 serving area; 2 preparation; 3 production; 4 dishwashing; 5 pot-wash; 6 cold room; 7 deep freeze; 8 dry store; 9 cleaning materials; 10 washroom/changing

23 Conventional/convenience kitchen (600 meals): typical layout (excluding administration and chef's offices)



1 serving area; 2 preparation; 3 production/regeneration; 4 dishwashing; 5 pot-wash; 6 cold room; 7 deep freeze; 8 cold room; 9 dry store; 10 cleaning materials; 11 washroom/changing

24 Cook/chill kitchen (600 meals): typical layout (excluding administration offices)

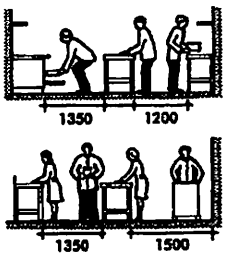
Main types of kitchen

Conventional Raw materials are brought into the kitchen, cleaned, prepared and cooked using conventional cooking equipment. The cost of skilled labour and additional space requirements usually limit this type of kitchen to high quality restaurants.

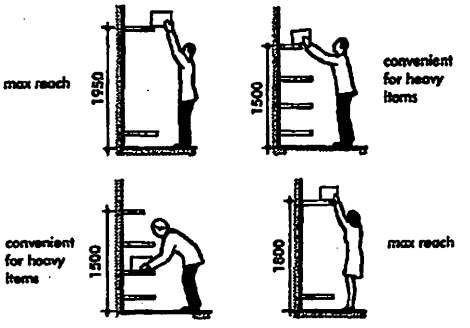
Conventional/convenience (see **23**) A type commonly adopted for mid-range restaurants, and also most staff restaurants. Pre-prepared raw materials are used with various mixes. Output is maximised while limiting labour, equipment and space costs.

Cook/chill (see **24**) Items are prepared and cooked in a remote kitchen. The food is chilled after cooking, and is kept at 0 to 3°C for 1 to 5 days maximum before being re-heated in specially designed ovens immediately before service. Benefits include reduction of kitchen space (although servery and dishwashing areas remain the same), and lower labour costs, especially in the evenings and when overtime rates are greatest. The greatest benefit occurs where several sites can be serviced from one unit (e.g. in hospitals and large factories).

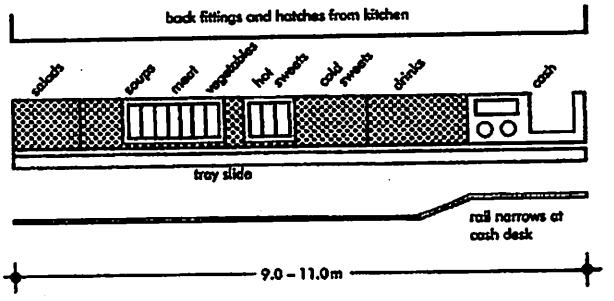
Cook/freeze Similar to cook/chill, but storage can be longer (up to 3 months) and frozen products are more robust (e.g. during transport). Note that temperature control (usually at -20°C) is very important and food can deteriorate dramatically when thawed.



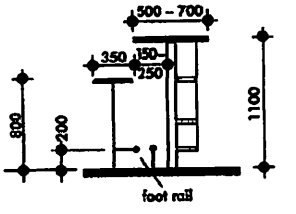
25 Minimum spaces between equipment to allow for circulation



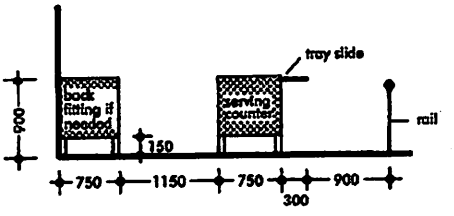
26 Limiting heights for store shelving



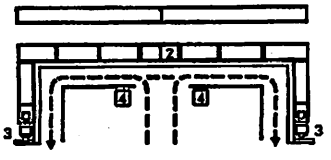
29 Self-service counter: single line arrangement



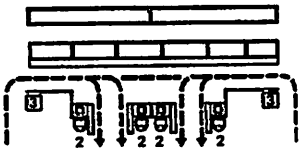
35 Bar counter: typical section



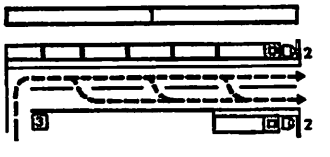
30 Self-service counter: typical section



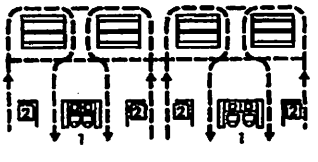
31 Self-service counter: divergent flow arrangement



32 Self-service counter: multiple outlet arrangement



33 Self-service counter: bypassing arrangement



34 Self-service counter: free-flow arrangement

COUNTERS/SERVING AREAS

Although not required in traditional restaurants with waiter service (except in bar area), in coffee bars and self-service restaurants the correct layout for counters or serving areas is a crucial part of the design. There is a fundamental difference between the counter in a snack/coffee bar (where customers are encouraged to remain at the counter) and the self-service counter (where customers must pass along the counter as quickly as possible). The layout of the menu, different foods, drinks and cash point at self-service counters follows established practice.

Self-service counters

Single-line arrangement is most common (***29***, ***30***); this has simplest flow, and requires only one cash desk, but can serve only 80 to 90 in 10 minutes. Parallel flow is similar but has two or more parallel counters.

Other layouts can be considered. Divergent flow (***31***) doubles the menu choice and customer flow. Multiple outlets (**32**) can increase customer flow by having several outlets and cash points; convergent flow is similar but has only one cash point. Bypassing (**33**) increases the flow by allowing customers to go to the cash point as soon as their choice has been made. Free-flow (linear) (***34***) has a separate counter for each menu; tray slides do not connect. Other free-flow patterns are also used (e.g. with counters not in line, or placed around perimeter).

Snack/coffee bar counters

Straight-run counters have the simplest layout, but greater service efficiency is obtained from U shapes (sec ***7***). For a typical cross-section see **35**.

- *Internet developments:* (e-tailing), whereby shoppers order on-line and the store delivers to the home. The longer term potential of this is still uncertain, but if it becomes very popular, areas in many stores will become redundant.

New forms of retailing Retail warehouse parks (which may have large showrooms), warehouse clubs and factory outlets are the major new forms of retailing currently emerging.

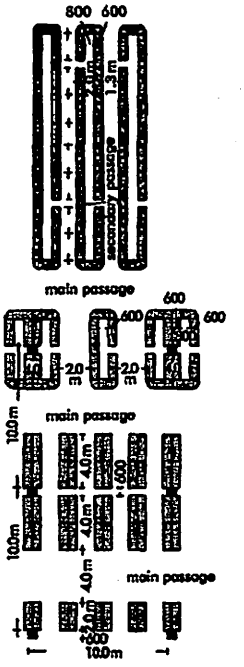
Shopping is now a leisure activity and a huge amount of marketing is aimed at identifying consumer trends and ensuring 'user satisfaction', attempting to give an emotional as opposed to a purely physical experience. Encouraging shoppers to spend, particularly in a very competitive environment, requires many subtle psychological techniques. Bookshops have coffee areas, with newspapers and magazines available, helping to increase 'dwell time'. Food supermarkets can display in the same area a different selection of food every day, sufficient for instance for a complete evening meal. The way that merchandise is arranged, the level and colour enhancement of artificial lighting, is very important.

While some stores have managed to reposition themselves to take advantage of changing trends, others – who a few years ago were household names, with apparently excellent management – have seemed unable to adapt and are suffering accordingly. Branding, rather than the product itself, is now seen to be increasingly important.

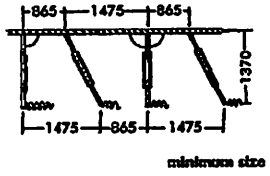
By the end of the 1990s, simple shed-like structures were no longer considered sufficiently inviting to customers, although there is an increasing need to standardise components in order to reduce costs and to allow the same components to be used on different sites.

Seventy per cent of the grocery trade is controlled by four retailers (and 96% by 12) and there is currently severe downward pressure on prices (partly due to governmental concerns; partly due to the entry of American stores).

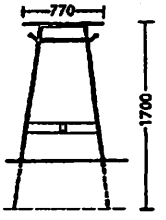
Space planning of retail areas can be greatly influenced by the occupancy totals requirements of fire regulations (see Fire, below) and access for people with disabilities is also becoming increasingly important.



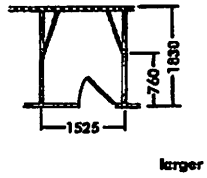
8 Typical arrangements of display units (solid squares represent structural columns)



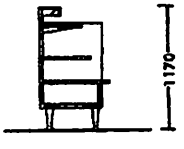
5 Fitting rooms

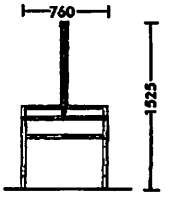


6 Free-standing hanging rack (length 1.525m)

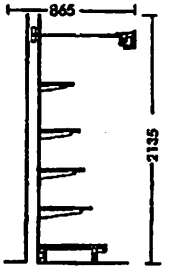


7 Self-selection unit (length varies); special merchandise needs special inserts

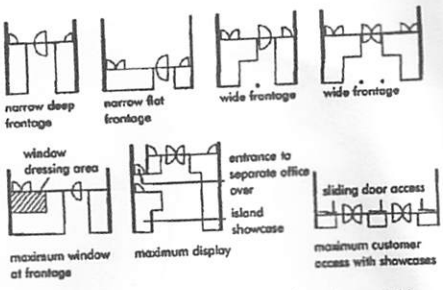




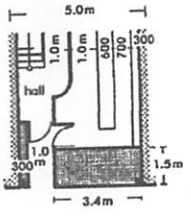
9 Millinery table



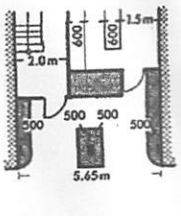
10 Back fixture with shelves only



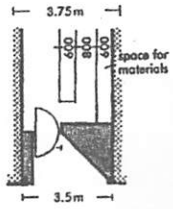
11 Shopfront layout variations: deep window plans suitable for fashion furniture etc.; shallow for jewellery, books, stationery etc.



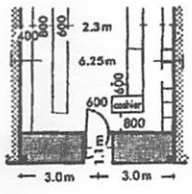
12 Display window extended by having shop entrance behind it and staircase to upper floors set back (minimum internal shop width 2.60 m)



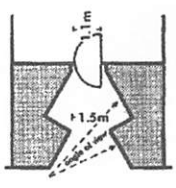
13 Very deep shops often permit extensive display windows; impressive even if shop itself is small



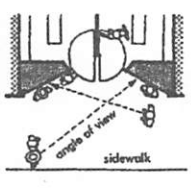
14 Deep shops may have wide vestibules with display windows at angles to entrance to attract customers from street traffic



15 Central doors suitable for shops ≥ 6.0–6.2 m wide; counters may be installed on both sides; cash/wrap should be near door



16 Narrow frontage: entrance can be recessed to provide larger display area with angled shopfront



17 By slanting entire window area and having doors in same line, idea of **16** is developed to its logical conclusion

TERMINOLOGY

Retail premises are traditionally classified in several different ways:

- food stores
- comparison goods (from town-centre malls to retail warehouses)
- types of centre (*e.g.* local, district or regional)
- location.

'*Comparison shopping*' is a term often used to describe centres which are individual shop units, many of which may be selling comparable goods; they are an essential part of traditional town centres.

'*Convenience shopping*' covers supermarkets where an edge-of-centre location may be best, with car parking that allows shoppers to walk to the town centre for other business. The maximum walking distance is usually around 300 m.

DETAILED DESIGN

Planning: use classes Three classes are used:

- A1: general retail
- A2: financial and professional services
- A3: food and drink.

These use classes are complex and must be taken to ensure accurate definition within use class A usually required. Changes although there are significant permission, from class A3 to A1 no longer e.g. change *Space planning and structural* mission).

	frontage width (m
■ large units	7.30–9.00
■ small units	5.30–6.00

Aisles Recommended minimum with subsidiary aisles 990 mm generally, 920 mm. System modules to type of shelving and bracketing.

Lifts and escalators These should visible from entrance. Lifts in large placed in the centre of the building 50 m from any part of the sales floor combined with escalators, which in people/hr or more must be transported should run in successive series (return sales floors, in both directions.

Food, alcohol, café, restaurant Particular hygiene and security legislation must be considered (see also Restaurants).

Staff facilities A rest room, lockers arrangements for outdoor clothes, drying WCs and washing facilities must be Separate entry to customers is desirable on size of premises.

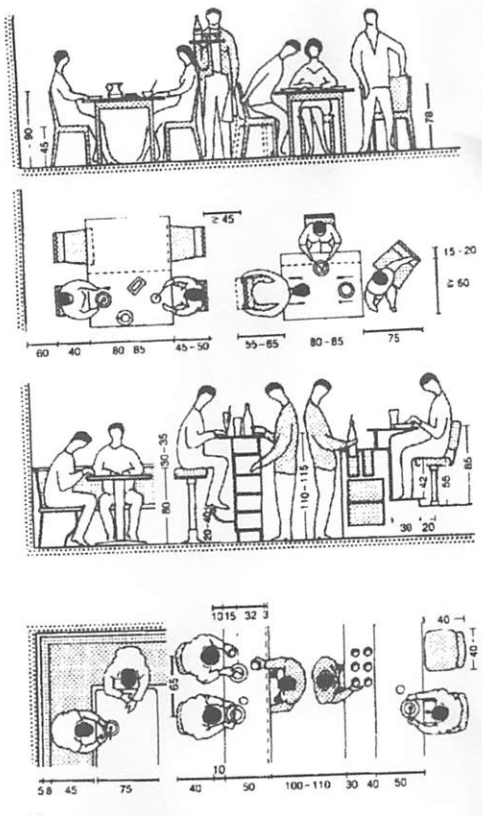
WCs Recommended provision is complex is needed to establish the correct category guidance is set out in BS 6465 (which information in the Offices, Shops and Premises Act, Factories Act, etc.). For small combined staff/customer WC may be (depending on the shop's area). If more staff are employed, or if in planning class and drink), higher provision is required.

RESTAURANTS: SPACEREQUIREMENTS

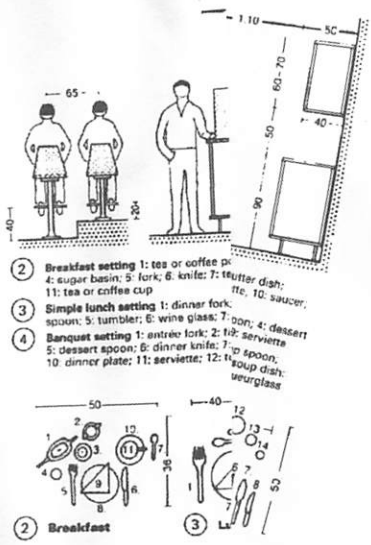
(See also pp. 255–6)

To be able to eat comfortat one person requires a table area of around 60cm v by 40cm deep. This provides sufficient clearance ween adjacent diners. Although an additional 20cmspace in the centre for dishes and tureens is sometimsirable, an overall width of 80–85cm is suitable for a ctable. Round tables, or tables with six or eight sides, diameter of 90 120cm are ideal for four people and o take one or two more diners.

The minimum spaces for ghfares, or between a table and a wall are shown lote that round tables require somewhat more floo



① **Space requirements for server and diner**

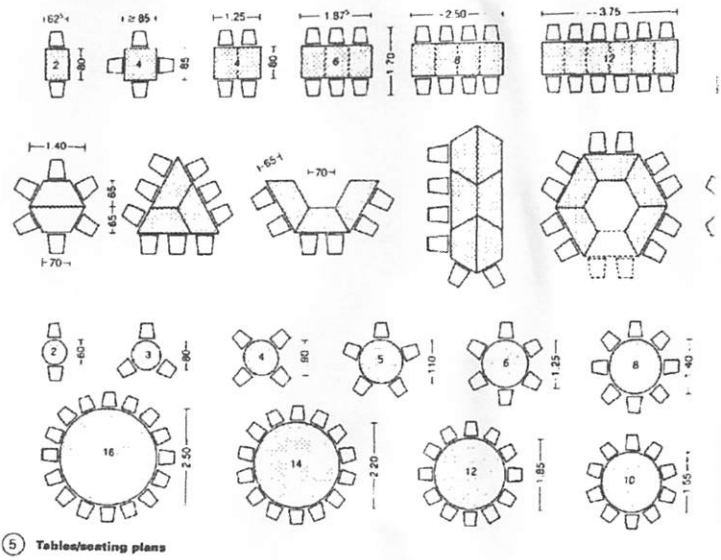


② **Breakfast setting 1:** tea or coffee p
4: sugar basin; 5: fork; 6: knife; 7: tutter dish;
11: tea or coffee cup
rfle, 10: saucer;

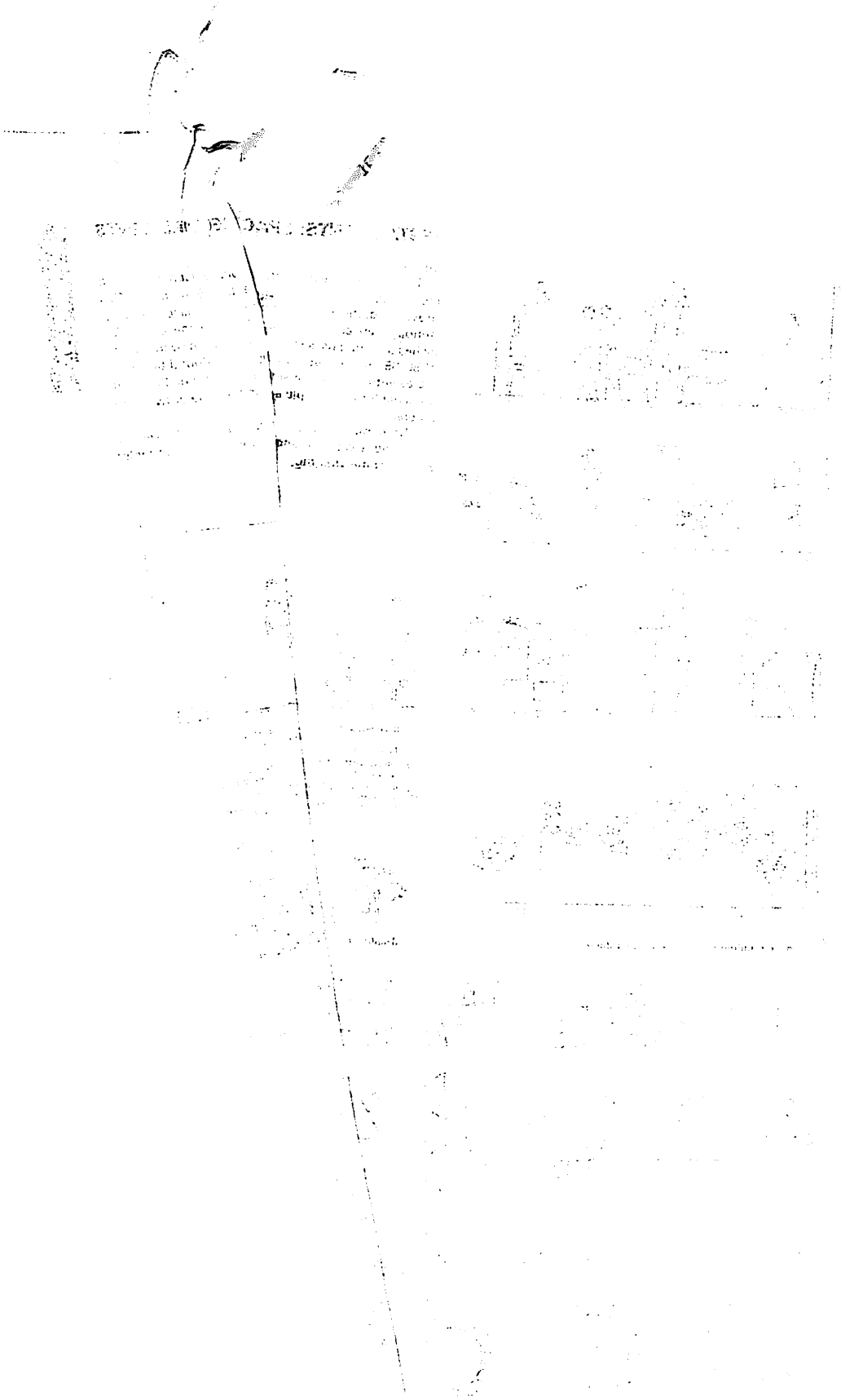
③ **Simple lunch setting 1:** dinner fork;
spoon; 5: tumbler; 6: wine glass; 7: oon; 4: dessert

④ **Banquet setting 1:** entrée fork; 2: fis: serviette
5: dessert spoon; 6: dinner knife; 7: p spoon;
10: dinner plate; 11: serviette; 12: soup dish;
eerglass

② **Breakfast** ③



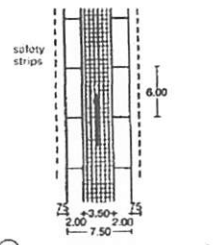
⑤ **Tables/seating plans**



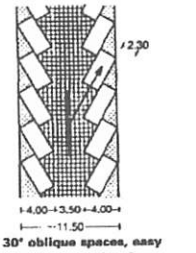
TURNING AND PARKING

Parking spaces are usually outlined by 12–20mm wide yellow or white painted lines. When parking is facing a wall, these lines are often painted at a height of up to 1 m for better visibility. Guide rails in the floor along the side have also proved popular for demarcation of parking limits, and can be about 50–60cm long, 20cm wide and 10 cm high. Where vehicles are parked in lines facing walls or at the edge of the parking deck in a multi-storey car-park, it is common practice to provide buffers, restraining bars or railings up to axle height to prevent cars from going over the edge. Where cars are parked face to face, transverse barriers about 10cm high can be used to act as frontal stops. Overhang on vehicles must be taken into account → ①. For lining up in front of a wall, a stop rail or rubber buffer will be sufficient → ①.

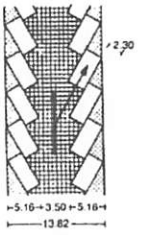
Garage parking spaces for cars should have an overall length of more than 5m and a width of 2.30m, but parking spaces for the disabled should be more than 3.50m wide.



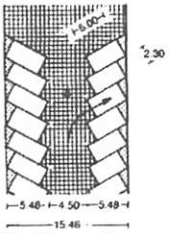
① **Parking parallel to the road**



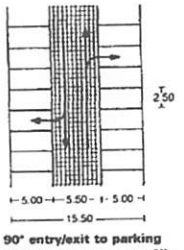
② **30° oblique spaces, easy entry and exit, but for use only with one-way traffic**



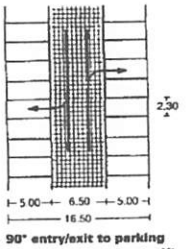
③ **45° oblique parking, one-way traffic only**



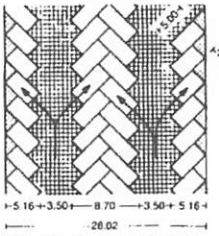
④ **60° oblique parking, one-way traffic only**



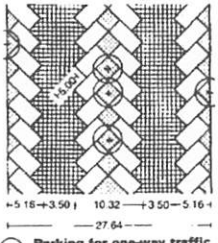
⑤ **90° entry/exit to parking spaces for two-way traffic Parking space 2.50 m wide**



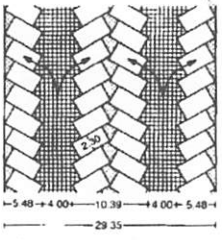
⑥ **90° entry/exit to parking spaces, for two-way traffic Parking space 2.30m wide**



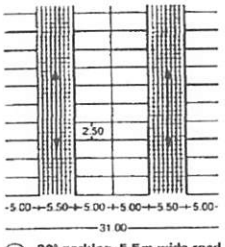
⑦ **45°-angled parking, one-way traffic only**



⑧ **Parking for one-way traffic (with spaces for plants)**

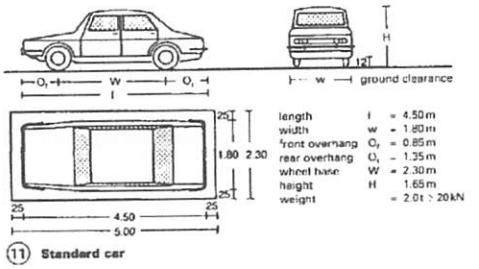


⑨ **60° angled parking, one-way traffic**

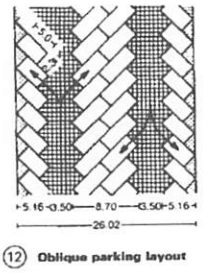


⑩ **90° parking, 5.5m wide road Parking spaces 2.5 m wide**

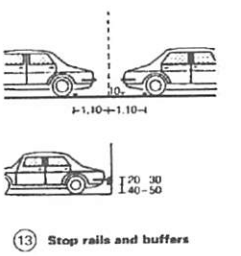
parking space arrangement	area/space (inc. open doors)	possible no. of spaces/100m² area	possible no. of spaces/100m of road (one side only)
· ① 0° - parallel to road. Entry and exit to parking bay difficult · suitable for narrow roads	2	4.4	17
· ② 30° -angle to access road. Easy entry to parking bay and exit. Uses a large area.	26.3	3.8	21
· ③ 45° -angle to access road. Good entry to parking bay and exit. Relatively small area/parking space. Normal type of layout	20.3	4.9	31
· ④ 60° angle to access road. Relatively good entry and exit to parking bay; small area/parking space. Arrangement often used	19.2	5.2	37
· ⑤ Right-angles to road (parking spaces 2.50m wide). Sharp turn needed for entry and exit	19.4	5.1	40
· ⑥ Right-angles to road (parking spaces 2.30m wide. Small area needed/parking space. Ideal for compact parking layouts, used frequently	19.2	5.2	37



⑪ **Standard car**



⑫ **Oblique parking layout**



⑬ **Stop rails and buffers**

2.2.Studi Banding Obyek

Studi banding obyek yang digunakan yaitu dari :

1.Internet

Data pembanding yang didapat dari internet adalah:

Deejay Domination's School of Higher Djing di North Miami Beach , USA

Di *Deejay Domination's School of Higher Djing ini dirancang dengan fasilitas yang lengkap dan dirancang dengan fasilitas lengkap dan dirancang untuk kenyamanan dalam kegiatan belajar dan berlatih sesuai dengan dunia kerja DJ.*

Ruang yang ada disekolah DJ ini adalah:

1. Ruang Kelas Teori

Ruang ini layaknya ruang-ruang kelas pada umumnya yang bertujuan menunjang kegiatan belajar mengajar. Akan tetapi jumlah muridnya sedikit sedikit karena sifatnya semi praktek, dimana instrukturnya menerangkan materinya secara teori dan praktek.

2. DJ Studio Personal

Ruang ini digunakan secara personal dan digunakan untuk latihan secara pribadi. Di studio ini terdapat perlengkapan DJ, meja DJ serta rak untuk menyimpan piringan hitam untuk sarana berlatih.

3. DJ Studio Group

Ruangan ini digunakan untuk berlatih bersama dan saling berinteraksi satu sama lainnya. Ruangan ini banyak terdapat peralatan DJ, Ruangan ini dirancang agar murid dapat berlatih dengan baik dan benar.

4. Studio Recording

Terdapat peralatan merekam seperti mixer dan multi track.

5. Record Shop

Dalam ruangan ini disediakan rak untuk menjual berbagai alat-alat maupun perlengkapan untuk DJ. Dan juga disediakan display piringan hitam atau record dan sofa panjang.

6. DJ Lounge

Disediakan berbagai jenis sofa untuk duduk sambil mendengarkan untuk Adanya mini stage untuk live performance DJ.

Foto 2.1. Kelas teori

Foto 2.2. DJ studio

Foto 2.3. DJ studio grup

Foto 2.4. Studio *Recording*

Foto 2.5. *Record shop*

Foto 2.6. DJ *Lounge*

(*sumber dari* www.schoolofhigherdjing.com)

Lantai

Ruangan pada *Deejay Domination's School of Higher Djing lantai untuk ruang kelas menggunakan vinyl sedangkan untuk ruang studio dan lounge menggunakan karpet, untuk ruang record shop menggunakan keramik warna putih dan karpet merah.*

Dinding

Pada ruang kelas menggunakan gypsum, pada pada ruang studio menggunakan gypsum dengan bahan akustik. Pada studio recording menggunakan bata bahan bata yang difinishing dengan plester. Sedangkan untuk ruang record shop dan Dj lounge menggunakan gypsum.

Plafon

Menggunakan gypsum khusus untuk studio menggunakan ceiling acoustic.

Pada ruang-ruang studio tidak memakai jendela karena berpengaruh pada system akustik didalam ruang serta konsentrasi latihan, hanya pada bagian pintu yang menggunkan jendela kecil.

2. Data hasil survey dan wawancara

C8 Disc Jockey Course, Jl. Comal no 8, Surabaya

1. Nama pemilik : DJ Gallan

2. Selain tempat kursus DJ juga menjual peralatan DJ, Piringan hitam dan cd.

3. Yang menarik adalah tempat kursus ini lebih maju dibandingkan dengan tempat lain dan dikenal dikalangan DJ Indonesia.

4.Ruangan dan yang ada di C8 Disc Jockey Course adalah:

- Lantai 1
  - Area tunggu
  - Penjualan
- Lantai 2
  - Area tunggu
  - Kelas teori
  - Studio Latihan
  - Area digital mixing dan recording

5. Murid yang datang berkisar antara 18 – 35 tahun.

6. Buka dari hari senin sampai sabtu , jam 10.00 – 18.00 wib.

7. lama latihan kurang lebih 1 jam dengan system bergantian.

Lantai pada record shop menggunakan terracotta sedangkan plafonya menggunakan plafon gantung yang terbuat dari gypsum berwarna putih. Dindingnya menggunakan plat besi yang dicat biru,

Untuk ruangan studio latihan, berada di lantai 2 dan dindingnya tidak di finishing jadi menggunakan warna asli plat besi. Lantainya menggunakan karpet berwarna merah gelap sedangkan plafonya hanya menggunakan kain berwarna hitam untuk system akustik. Di dalam studio latihan ini juga terdapat area digital mixing dan recording untuk area tunggu berada di lantai 2 diluar ruangan studio latihan karena bersifat semi outdoor.

Foto 2.12. Studio latihan

Foto 2.13. Plafon studio latihan

Besaran ruang pada kelas teori di De majors Dj Course adalah 8 m x 8 m hal ini dikarenakan jumlah murid yang dilatih sekitar 8 orang, sedangkan pada studio latihan berukuran 3 m x 3 m yang hanya digunakan untuk 1 orang murid dan pengajar, pada area digital mixing dan recording ukuran ruang yang dipakai yaitu 4 m x 5 m.

2.3. Kesimpulan

Berdasarkan data-data diatas dapat diketahui bahwa dalam merancang ruang untuk Sekolah DJ ini diperlukan material maupun bahan yang baik untuk mengatur akustik ruang yang dihasilkan oleh musik sehingga murid dapat mendengar dengan jelas dan baik.

BAB III

KAJIAN TEMA

3.1. Kajian Tema

Arsitektur modern itu timbul karena adanya kemajuan dalam bidang teknologi yang membuat manusia cenderung untuk sesuatu yang ekonomis, mudah dan bagus. Hal itu dapat dilihat dari adanya penemuan – penemuan seperti dinamit yang memudahkan manusia untuk menggali lubang atau penggunaan mesin yang dapat mempercepat produksi dan menghemat tenaga manusia. Tapi itu semua tidak membuat manusia senang karena penggunaanya yang disalahgunakan, karena dinamit yang mestinya membantu manusia malah mencelakakan manusia, yang memudahkan manusia malah menyulitkan manusia itu sendiri. Berarti apa yang dibuat didalam jaman modern itu belum tentu bagus/masih ada kekurangannya. Dikatakan masih ada kekurangannya karena yang diciptakan manusia itu pada dasarnya tidak ada yang sempurna selain itu penggunaan yang disalah gunakan bisa membuat karya manusia itu berbalik menjatuhkan manusia itu sendiri.

Arsitektur Modern sebelum Perang Dunia I dimulai dengan adanya pengaruh Art Nouveau yang banyak menampilkan keindahan plastisitas alam, dilanjutkan dengan pengaruh Art Deco yang lebih mengekspresikan kekaguman manusia terhadap kemajuan teknologi. Konsep tersebut kemudian dimanifestasikan ke dalam media arsitektur dan seni, serta gaya hidup.

Bagian-bagian dalam arsitektur modern adalah :

1. arsitektur modern
2 arsitektur art Nouveau
3 arsitektur brutalist
4. arsitektur konstruksi
5. arsitekturEkspresionist
6. arsitektur futurist

7. arsitektur fungsional
8. gaya internasional
9. gaya organik
10.gaya post modern
11.gaya visionari

3.2. Pengertian Arsitektur Modern

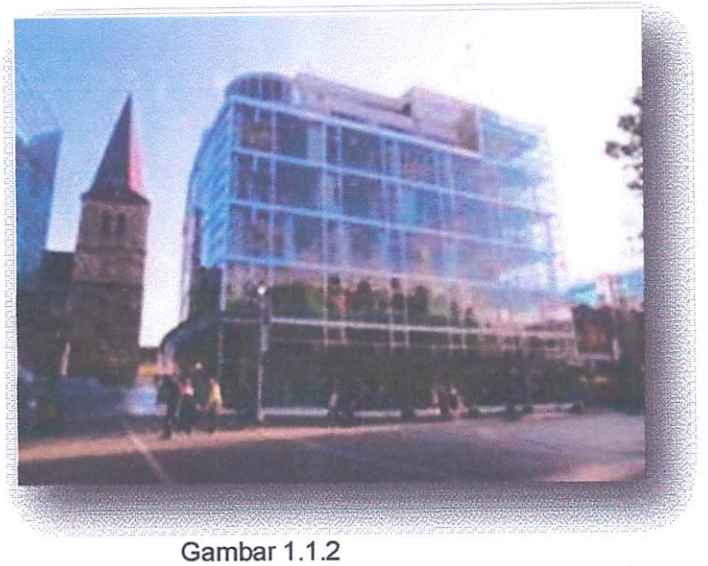
Arsitektur modern adalah suatu istilah yang diberikan kepada sejumlah bangunan dengan gaya karakteristik serupa, yang mengutamakan kesederhanaan bentuk dan menghapus segala macam ornamen. Pertama muncul pada sekitar tahun 1900. Pada tahun 1940 gaya ini telah diperkuat dan dikenali dengan Gaya Internasional dan menjadi bangunan yang dominan untuk beberapa dekade dalam abad ke 20 ini. Asal dan karakteritis arsitektur modern sampai sekarang ini masih di perdebatkan dalam kalangan arsitek.

Beberapa sejarawan melihat perkembangan arsitektur modern sebagai perihal sosial yang kelat kaitannya terhadap pembaharuan dan keringanan, suatu hasil dari perkembangan sosial dan politis. Arsitektur lainnya yang melihat gaya modern sebagai sesuatu yang di kendalikan oleh teknologi dan pengembangan produk dan dengan munculnya bahan-bahan yang dipakai dalam membangun gaya bangunan modern seperti material besi, baja, kaca dan beton menambahkan pengetahuan bahwa gaya modern adalah sebuah penemuan baru dalam bidanga Revolusi Industri. Pada tahun 1796, Shrewsbury dengan gaya desainnya ohwis yang ' tahan api', yang mana gaya ini bersandar pada besi cor dan batu bata. Konstruksi seperti itu sangat memperkuat struktur bangunan, yang memungkinkan mereka untuk mengakomodasi banyak mesin yang lebih besar. Sejarawan lain menghormati pandangan moderen sebagai suatu reaksi melawan terhadap gaya ekletik dan mencurahkan perhatian mereka kepada gaya Jaman Victorian dan gaya Seni Nouveau.

Apapun yang menjadi penyebab pada tahun 1900 sejumlah arsitek di seluruh muka bumi mulai mengembangkan gaya arsitektur mereka beralih dari arsitektur yang klasik (Gotik sebagai contoh) dengan berbagai kemungkinan teknologi baru. Arsitek

Louis Sullivan dan Frank Llyod Wright di Chicago, Viktor Horta di Brussels, Antoni Gaudi di Barselona, Otto Wagner di Vienna dan Charles Rennie Mackintosh di Glasgow, dan masih banyak lagi arsitektur modern lainnya berusaha membangun gaya modern pada bangunan dengan meninggalkan gaya lama.

Contoh bangunan gaya modern :



Gambar 1.1.2
Istana Kaca (1935) di belanda arsitektur Frits Peutz, dibuat dengan konsentrasi kaca dan baja

3.3 Teori Arsitektur Modern Menurut Mies Van Der Rohe

Mies Van Der Rohe menyakini bahwa sebuah benda adalah sebuah simbol dari realitas yang tersembunyi. Arsitektur menurut pandangannya adalah semangat dan keinginan untuk menerjemahkan zaman kedalam ruang esensi dari teknologi modern, merupakan bagian penting yang harus bermakna dalam karya arsitektur. Hal ini terungkap karena pemikirannya bahwa teknologi dalah ungkapan intelektualitas manusia modern dan teknologilah yang mendominasi kecendrungan mendatang.Pada sekitar tahun 1919 Mies mencurahkan perhatiannya untuk mempelajari masalah modern design, setelah sebelumnya memakai gaya neo classic.

Tiga tema pokok dalam rancangannya adalah:

1. Pengaruh kaca sebagai pelindung.
2. Penekanan bangunan dengan arah horizontal.
3. Pengembangan bangunan sesuai dengan fungsi.

Konsep yang dikembangkan adalah flowing space (ruang mengalir) seperti yang terlihat pada karyanya: German Pavillon International Exhibition di Barcelona (1929) dan Tugendhat House (1930), dengan ciri-ciri :

- Pembagian ruang dengan dinding berdiri sendiri.
- Atap ditopang oleh kolom baja.
- Pembagian ruang dengan partisi merupakan perwujudan idenya tentang flexibility (ruang flreksibel).
- Penggunaan bahan yang mahal pada partisi.

Konsep-konsep Mies yang terpenting yang dipakai dalam merancang :

- Konsep ruang tunggal (Universal Space). Merupakan pengembangan dari konsep flowing space yaitu ruang-ruang universal yang terbagi oleh partisi dengan kolom bagian sisi sehingga rating bebas kolom.
- Penggunaan bahan baja sebagai struktur utama mencerminkan suatu kesederhanaan dari bentuk-bentuk persegi panjang. Kesederhanaan itu sendiri bukan suatu kesederhanaan yang tidak bernilai tetapi suatu kesederhanan yang

berlandaskan suatu pemikiran untuk mremecahkan masalah lebih sederhana lagi yang terkenal dengan semboyan 'Less is More'.

Menurut pandangan Charles Jends, Mies menuntut orang menilai bangunannya secara sempurna seperti halnya pandangan Plato.

Pandangan-pandangan lain oleh beberapa ahli :

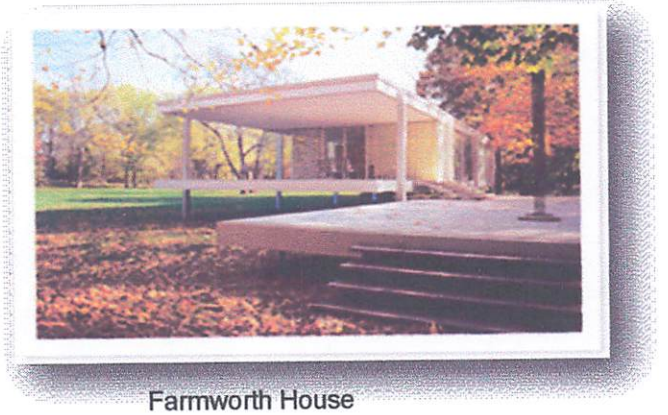
Lewis Numford. "Karya Mies tidak dapat dinilai pada tingkat harfiah, ia harus dinilai bagaikan sebuah puisi. Karena penilaian harfiah akan membuka kelemahan pada karyanya."

Sigfried Gidieon. "Karyanya membawa esensi kualitas tiap material dan detail konstruksi yang diolah sehingga mencapai tingkat yang menakjubkan."

William Jordi. "Karyanya merupakan hasil kesempurnaan visual dan berhasil memecahkan persoalan sudut massa bangunannya."

Peter & Allison Smithson. "Keabadian penampilan kulit bangunannya yang netral dengan struktur ruang terbuka dari tiap lay outnya. Bentuk dan ruangnya universal, dapat dimanfaatkan bagi segala keinginannya."

Paul Rudolf. "Bangunan Mies menakjubkan hanya karena ia mengabaikan banyak aspek dari bangunan."



Farmworth House

Rumah tempat peristirahatan Dr. Farmworth. Bangunan dibuat kontras dengan lingkungan, dengan bentuk giometris, pilihan warna (putih) serta bidang sejajar besar yang mencerminkan ruang terbuka. Bangunan ini menonjolkan teknologi dengan bidang kaca yang besar serta struktur baja I sebagai pendukung dan pembagi visual. Baja dan

kaca tidak dirubah, tetap seperti aslinya (machine fonn), dengan kepandaiannya mengolah maka semua unsur terpadu menjadi sebuah karya monumental yang elegan.

Mies Van Der Rohe merupakan salah satu arsitek yang telah ikut berperan serta didalam dunia Arsitektur Modern, dimana dalam setiap karyanya, bangunan yang dihasilkan lebih sering mengacu pada dirinya sendiri dan tak jarang pada setiap ciptaannya selalu melekat dan dijiwai oleh pernyataan **LESS is MORE**.

Salah satu karyanya yang terkenal adalah Seagram Building, New York yang dirancang sedemikian mewah dengan clad yang terbuat dari perunggu padu, dinding-dinding kaca, baja yang diekspos penampilannya. Dapat dikatakan bahwa setiap detail dari Seagram Building ini di desain khusus, sehingga keberhasilan Mies Van Der Rohe terdapat pada pengolahan fasade bangunan. (sumber diambil dari http://www.arsiteka.com/2008/11/mies-van-der-rohe-pelopor-arsitek.html)

3. 4. Kesimpulan

berkaitan dengan judul yang akan dipakai pada konsep skripsi kali ini yaitu Sekolah Disc Jockey di malang karena kebutuhan akan ruang kosong sangat dibutuhkan agar para pendengar musik tidak merasa terganggu oleh kolom yang akan mempengaruhi kenyamanan ruang itu sendiri. Konsep-konsep yang dipakai oleh mies van de rohe sangat mendukung dengan kajian judul yang akan di pakai karena kebutuhan akan ruang yang sangat diperlukan untuk perancangan Sekolah Disc Jockey di malang.

BAB IV

TINJAUAN LOKASI

4.1.LOKASI SITE

4.1.1. GAMBARAN TENTANG LOKASI SITE

Lokasi site yang diusulkan di dalam proses perancangan Sekolah Disc Jockey berada di kota Malang. Adapun pertimbangan-pertimbangan yang mendasari pemilihan lokasi site ini adalah karena kota Malang merupakan salah satu kota yang berpotensi untuk pengembangan fasilitas-fasilitas seperti halnya tempat penjualan maupun tempat pamer alat-alat musik. Mengingat perkembangan di kota ini sangat pesat. Banyak sekali pendatang yang berasal dari luar kota Malang. Baik untuk keperluan pendidikan maupun pekerjaan. sehingga di kota tersebut perlu adanya suatu bangunan yang dapat menampung seluruh kegiatan yang berkaitan dengan musik.

Pemilihan lokasi yang tepat, akan sangat mempengaruhi kelangsungan berkembangnya bangunan Sekolah Disc Jockey ini, dan juga mempengaruhi perkembangan kawasan sekitar site tersebut. Lokasi yang dipilih berada pada Jl. Soekarno-Hatta, kawasan tersebut merupakan tempat area perdagangan dan juga sebagai pusat aktivitas warga Malang dan sekitarnya, terdapat banyak ruko, fasilitas hiburan, dan dekat dengan beberapa perguruan tinngi yang ada di kota Malang.

Adapun data-data dan wilayah administratif site:

- Luas site : 18.736 m²
- Kelurahan : Mojolangu
- Kecamatan : Lowokwaru
- Batas sebelah utara : Perum Griya Shanta
- Batas sebelah selatan : Ruko Soekarno-Hatta
- Batas sebelah timur : Perumahan warga
- Batas sebelah barat : Ruko Soekarno-Hatta

Pada bangunan yang terdapat disekitar lokasi banyak dijumpai bangunan bergaya arsitektur modern, sehingga lokasi site yang diambil sesuai dengan tema perancangan Sekolah Disc Jockey yaitu "arsitektur modern".

Site yang direncanakan untuk perancangan galeri musik tersebut relatif tidak berkontur, hal ini dapat menjadi pedoman dalam penataan masa bangunan dan untuk memaksimalkan pandangan (view) ke dalam bangunan.

4.2 Data-data Lingkungan

4.2.1 Data fungsi sekitar tapak

Pada sebelah utara dan barat tapak, terdapat perumahan Griya Shanta yang padat penduduk. Keadaan yang terlihat pada perumahan tersebut adalah sepi ketika pagi dan sore hari, hal ini dikarenakan hampir seluruh penghuni kawasan tersebut melakukan aktivitas bekerja dan bersekolah. Terdapat jalan di perumahan tersebut yang dapat dimanfaatkan untuk akses menuju ke site.

Batas sebelah selatan tapak terdapat beberapa ruko yang menyediakan berbagai keperluan sehari-hari, distro pakaian, dan fasilitas hiburan seperti tempat bilyard. Ruko tersebut beraktivitas mulai dari pagi hari hingga sore hari, sehingga daerah sekitar menjadi ramai pengunjung dengan lalu lintas yang sangat padat.

Pada bagian sebelah timur terdapat Taman Krida Budaya, salah satu bangunan yang terkenal di kota Malang. Bangunan bergaya arsitektur Jawa tersebut sering sekali digunakan untuk berbagai acara, seperti pameran, sendratari, pertunjukan musik, dsb. Taman Krida Budaya hanya digunakan pada even-even tertentu, namun ketika berlangsungnya acara lokasi tersebut menjadi sangat ramai pengunjung dan tak jarang menimbulkan kemacetan lalu lintas.

4.2.2 Analisa Vegetasi

Ada beberapa vegetasi yang sudah eksisiting pada lokasi site dan sekitarnya. Di sekitar lokasi site terdapat beberapa pohon palm yang tertata pada koridor jalan menuju lokasi site. Seperti yang terlihat pada gambar di bawah ini. Pohon palm memang sangat cocok dengan kondisi site dan keadaan sekitar lokasi site.

Selain pohon palm juga ada beberapa deretan pohon

Pohon palm yang terdapat pada pedestrian jalan raya Soekarno-Hatta tersebut dapat dimanfaatkan sebagai tanaman pembatas, dan akan tetap dipertahankan kelestariannya. Pohon tersebut juga menjadi citra kawasan sepanjang jalan arteri tersebut.

4.2.3 Sirkulasi Lalu Lintas

Terdapat tiga macam sirkulasi:

- Pergerakan manusia, cenderung menuju ke arah kantor-kantor dan perguruan tinggi yang terdapat di ujung jalan tersebut, seperti Politeknik Negeri Malang, Universitas Brawijaya, ITN Malang, UIN Malang, dan beberapa universitas tinggi lainnya. Pejalan kaki memanfaatkan pedestrian yang terdapat disepanjang jalan tersebut.
- Kendaraan pribadi yang melintas baik dari arah pasar Blimbing maupun dari arah kota bergerak menuju dan meninggalkan kota.
- Beberapa kendaraan umum melintasi jalan tersebut bergerak cenderung menuju ke arah kota dan beberapa instansi pendidikan.
- Sering terjadi kemacetan terutama pada daerah yang terdapat di sekitar tapak, jika terdapat berbagai macam acara di Taman Krida Budaya.

4.2.4 Utilitas Lingkungan

Gambar di atas menunjukkan sistem buangan air kotor dan air hujan yang berasal dari perumahan warga dan jalan perumahan serta jalan arteri Soekarno-Hatta. Selokan tersebut memiliki kedalaman berkisar antara 50-60 cm, dapat dimanfaatkan untuk sistem buangan air kotor dari bangunan music centre. Sistem buangan air kotor tersebut disalurkan secara langsung menuju riol kota.

4.3 Foto-Foto Lokasi Site

Tampak Depan Lokasi

Tampak Samping kanan

Keadaan site

Jalan Raya menuju site

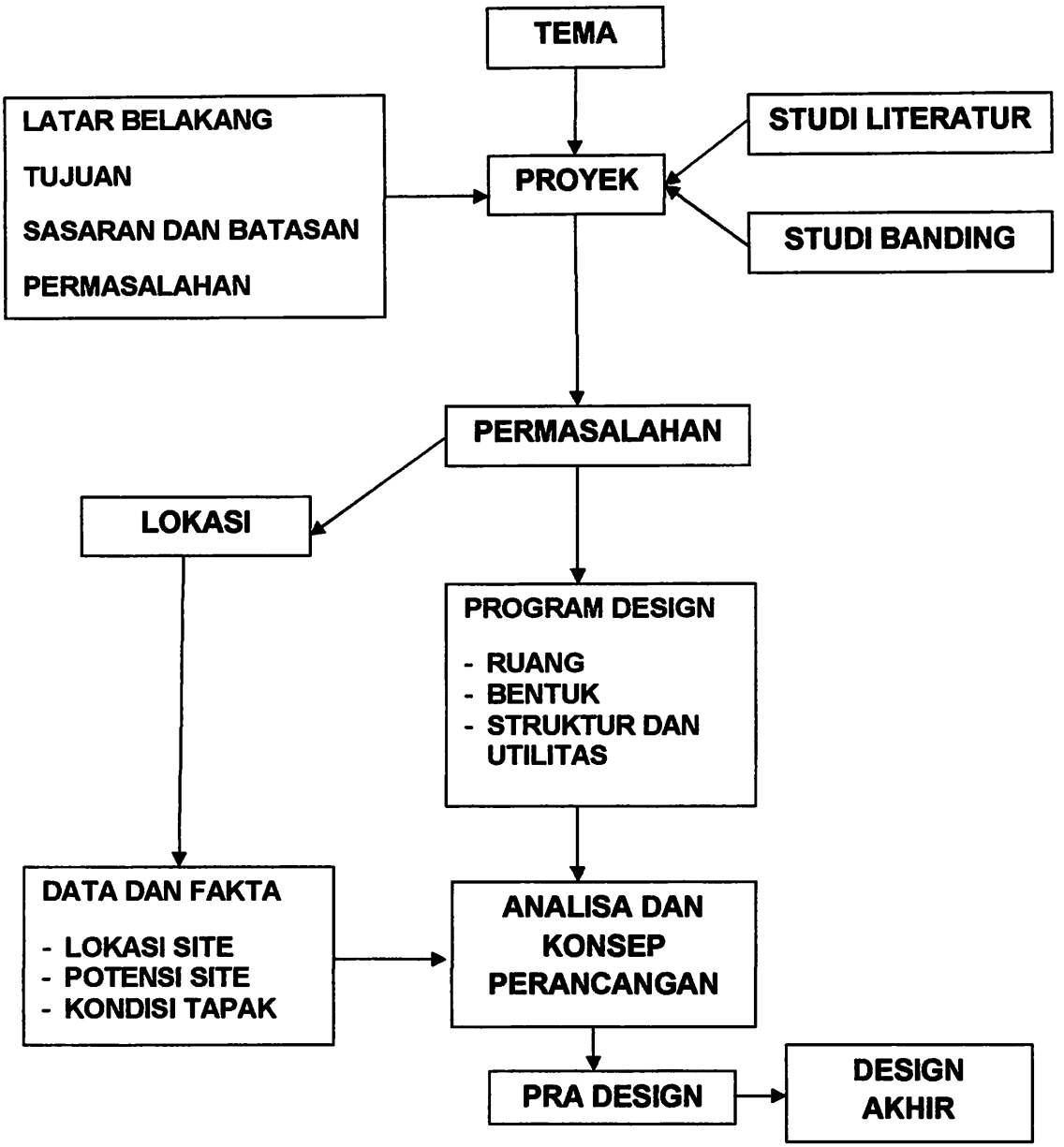
4.4. Potensi Tapak

Jl.Soekarno Hatta merupakan tempat area perdagangan dan juga sebagai pusat aktivitas warga Malang dan sekitarnya, di loasi ini terdapat banyak ruko, fasilitas hiburan, dan dekat dengan beberapa perguruan tinngi yang ada di kota Malang sehingga dapat memudahkan para murid yang ingin belajar dan juga warga yang ingin melepas kepenatan tanpa harus jauh dari tempat ramai.

4.5. Permasalahan Tapak

Adanya hunian dan permukiman penduduk di sekitar lokasi membuat masalah dalam perencanaan ini karena dapat menggangu aktivitas yang ada pada sekolah Disc Jockey ini.

5.1. Diagram Proses Perancangan

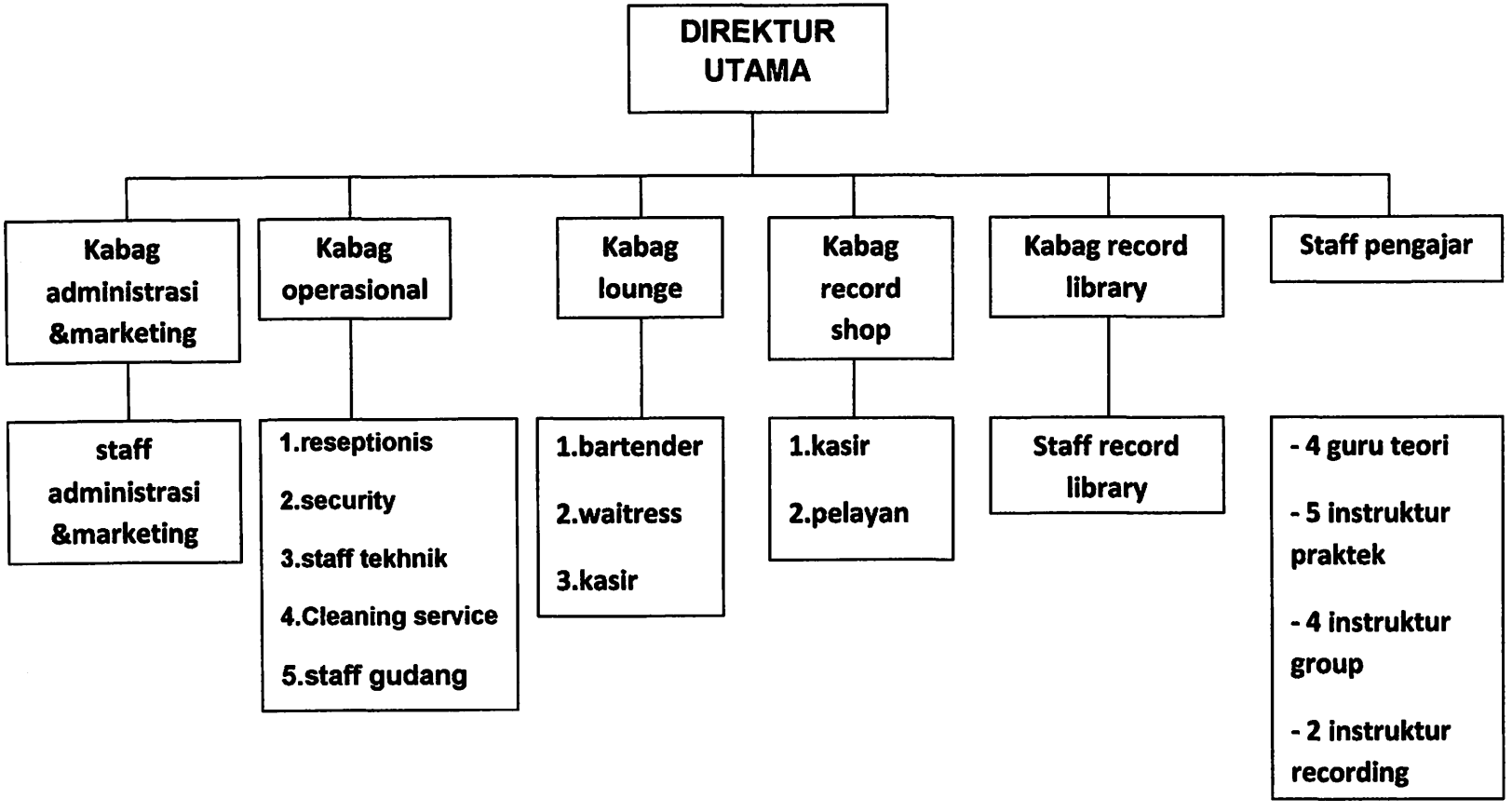


BAB VI

ANALISA PERANCANGAN

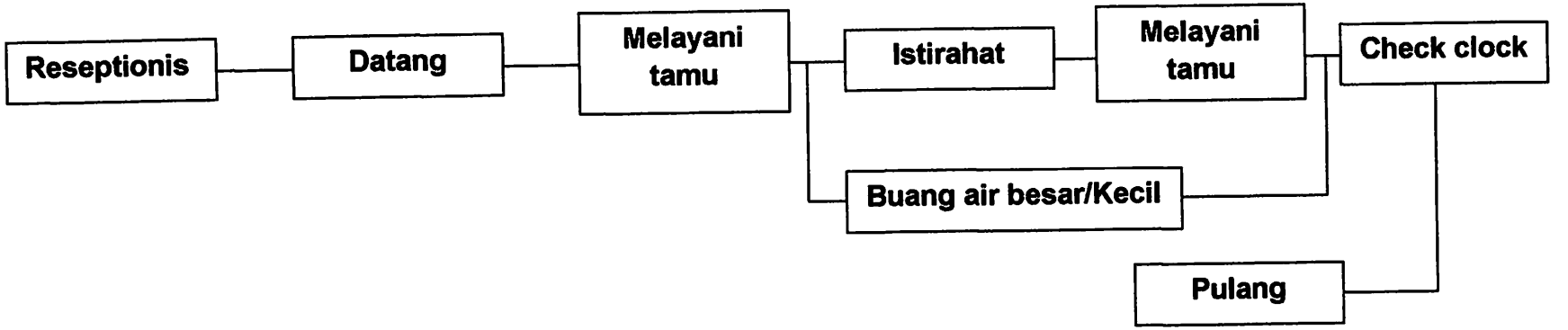
6.1. Analisa Ruang

6.1.1. Struktur Organisasi

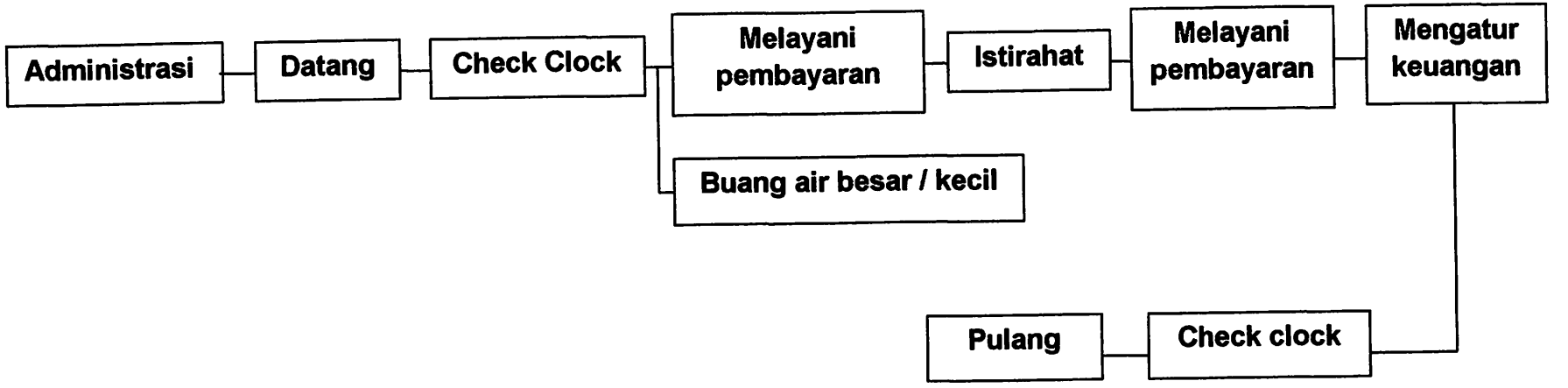


6.1.2. Pola Aktivitas

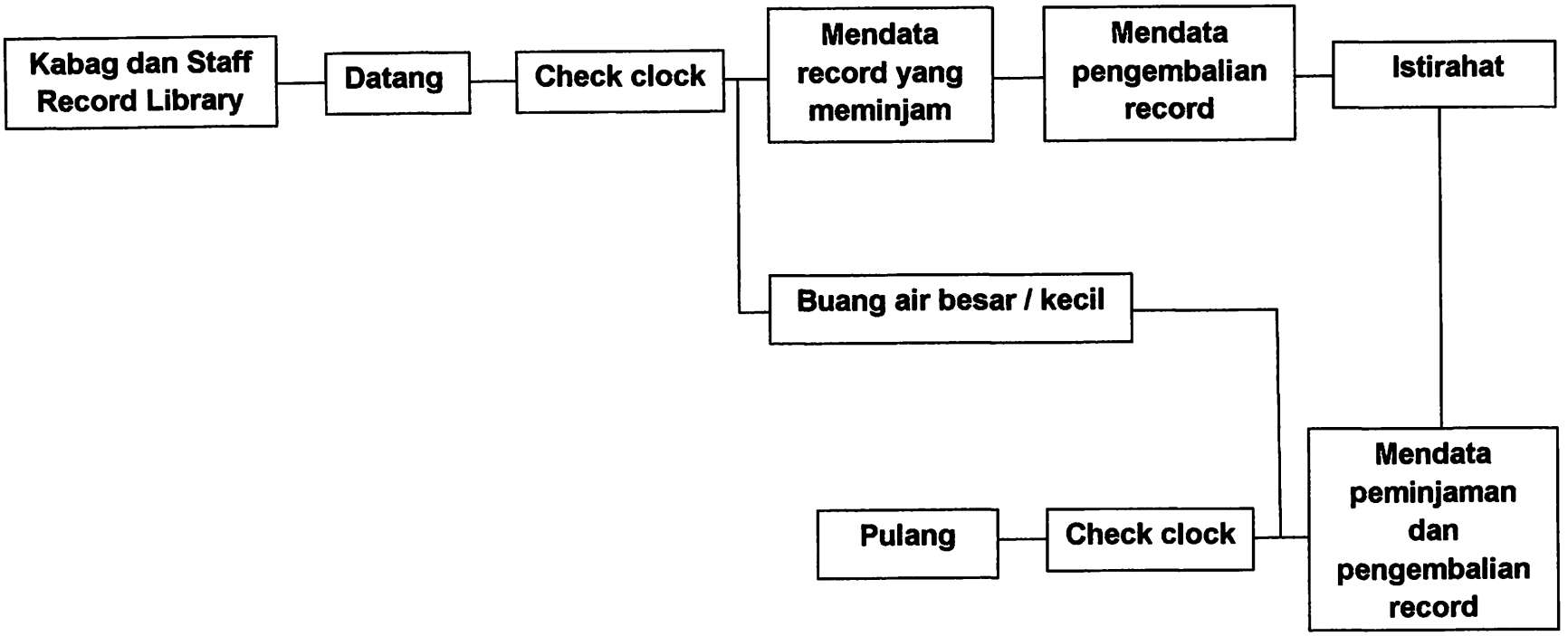
- **Pola Aktifitas Reseptionis**



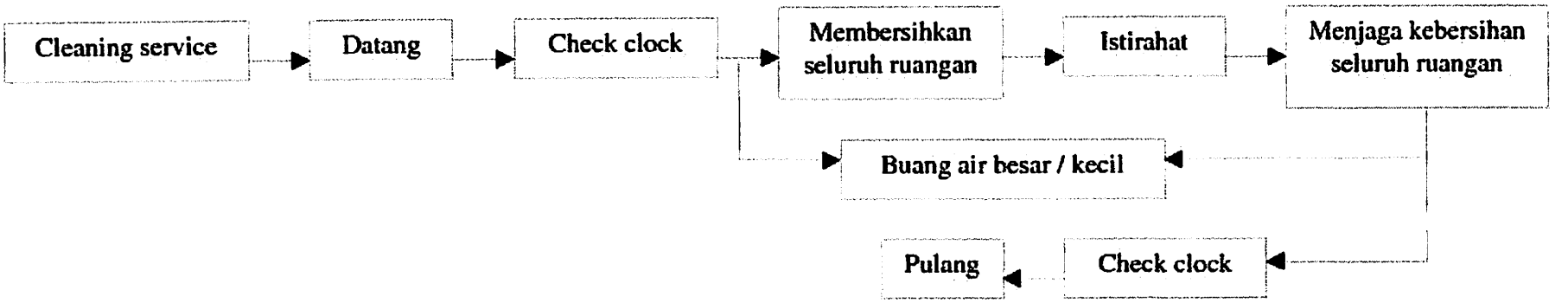
- **Pola Aktifitas Staff Administrasi**



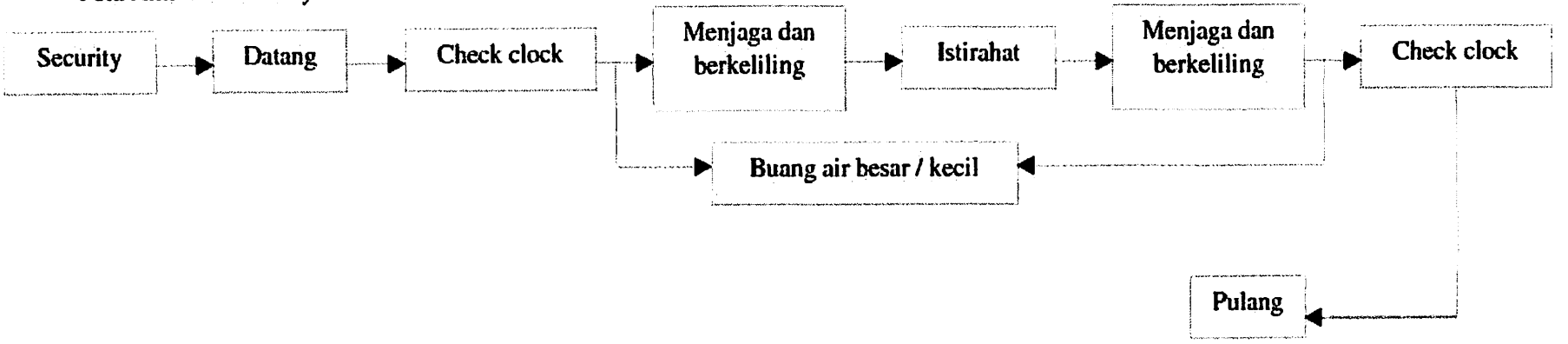
- **Pola aktifitas Kepala Bagian dan Staff Record Library**



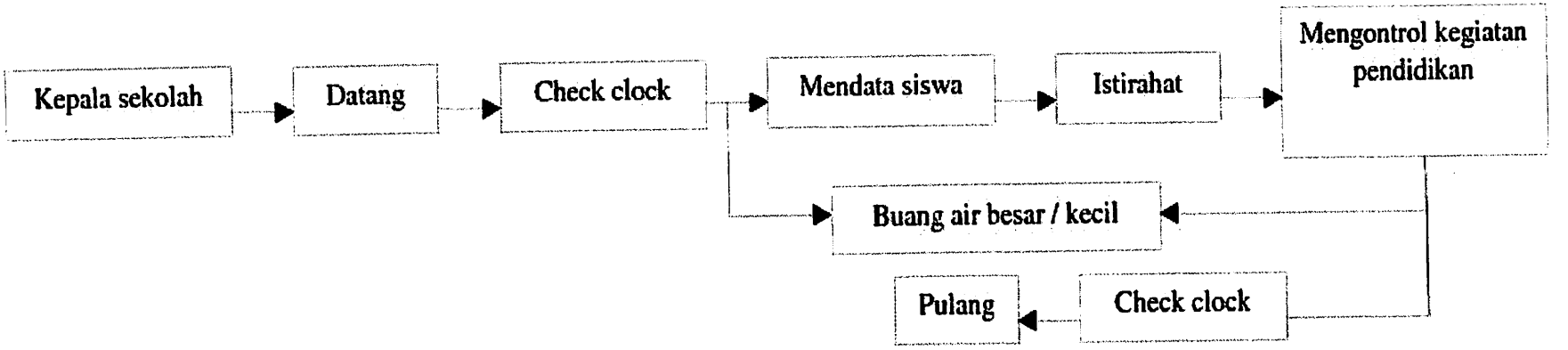
- Pola Aktivitas *Cleaning Service*



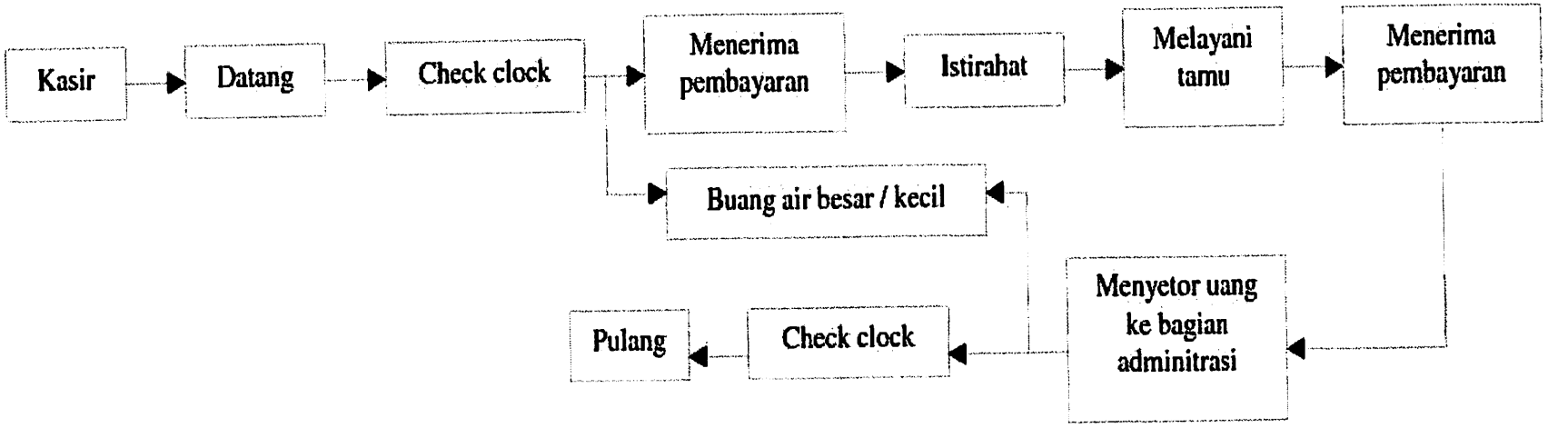
- Pola Aktivitas *Security*



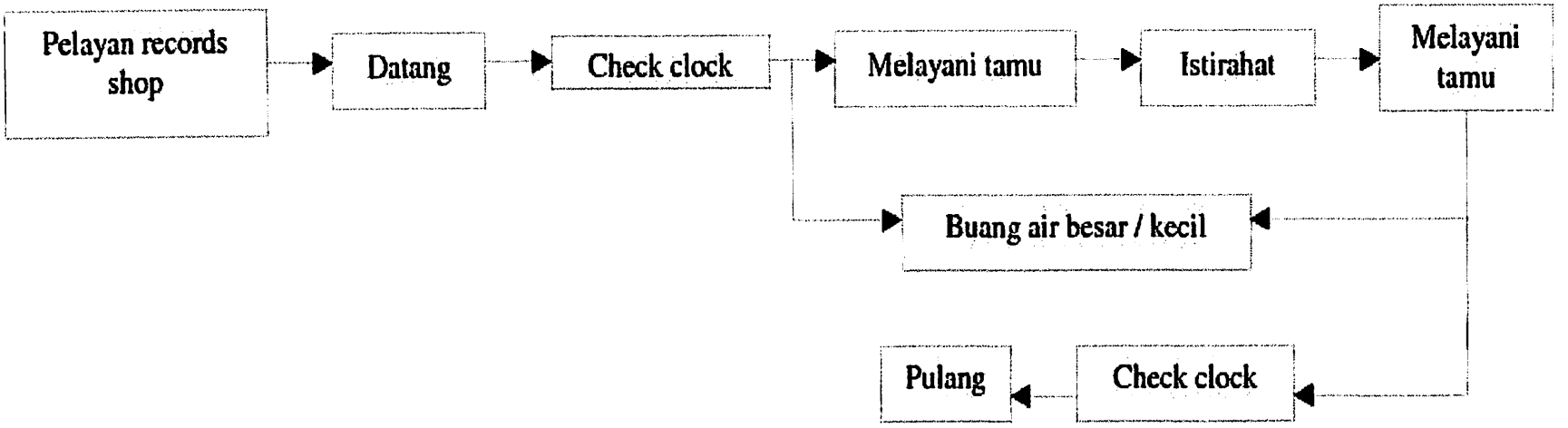
- Pola Aktivitas Kepala Sekolah



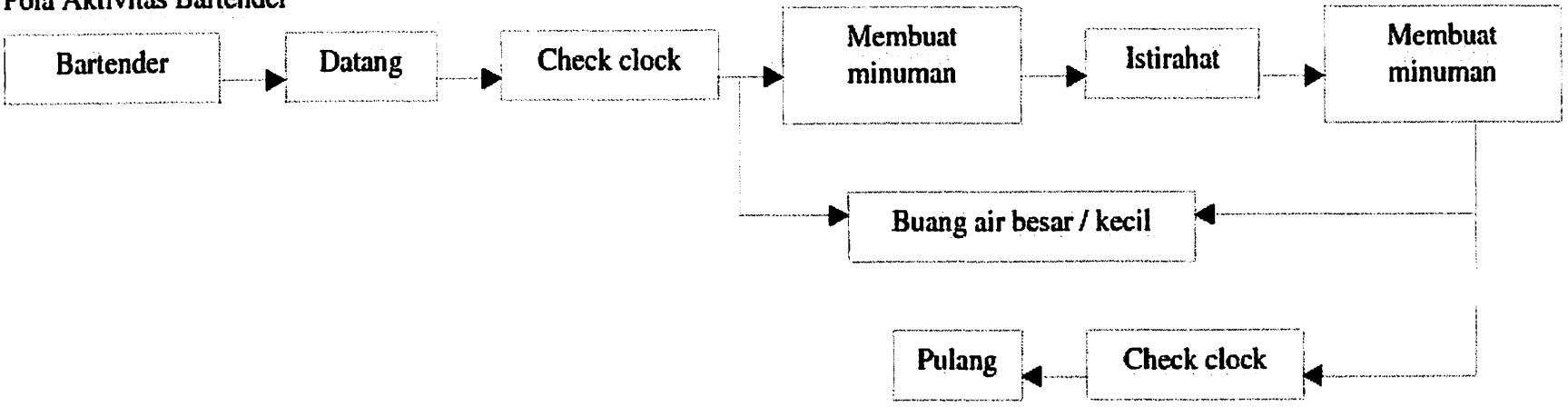
- Pola Aktivitas Kasir



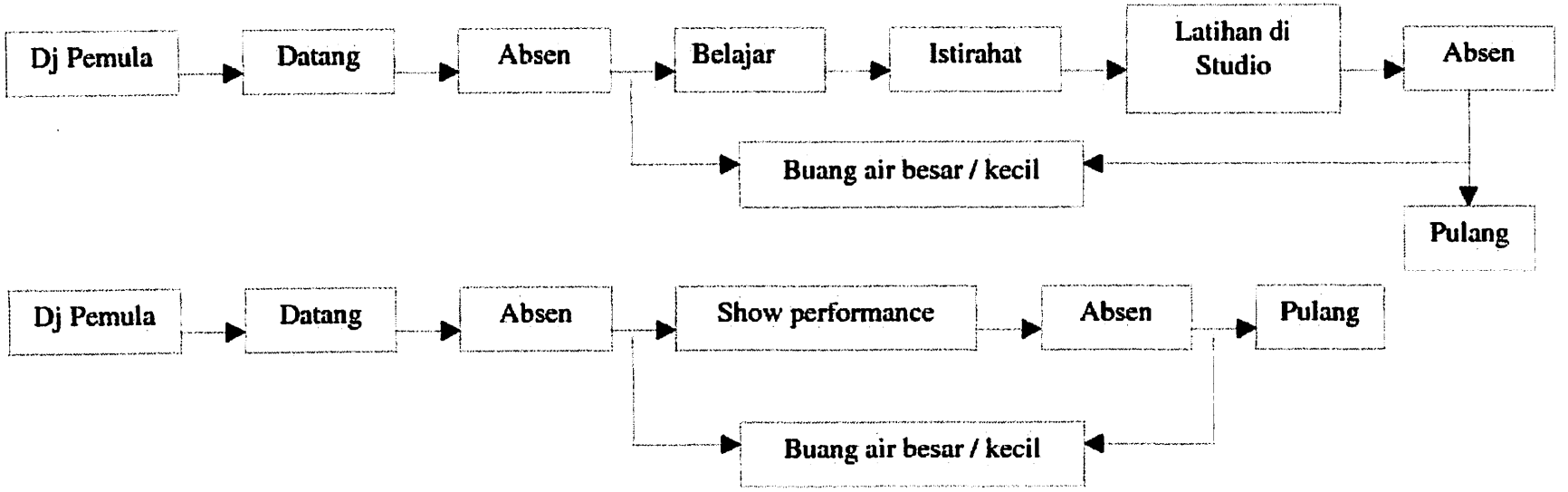
- Pola Aktivitas Pelayan *Records Shop*



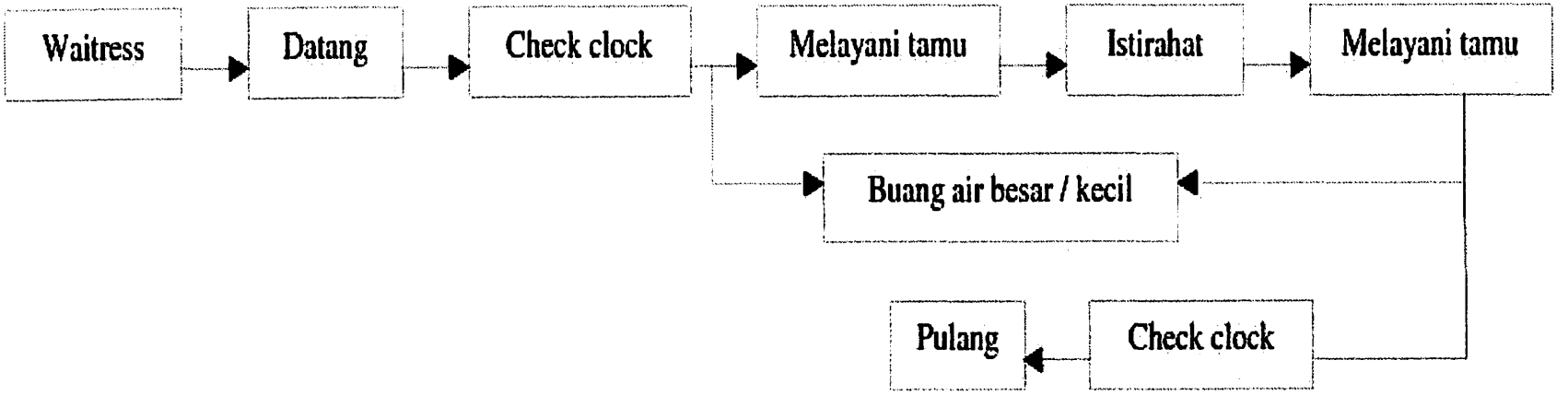
- Pola Aktivitas Bartender



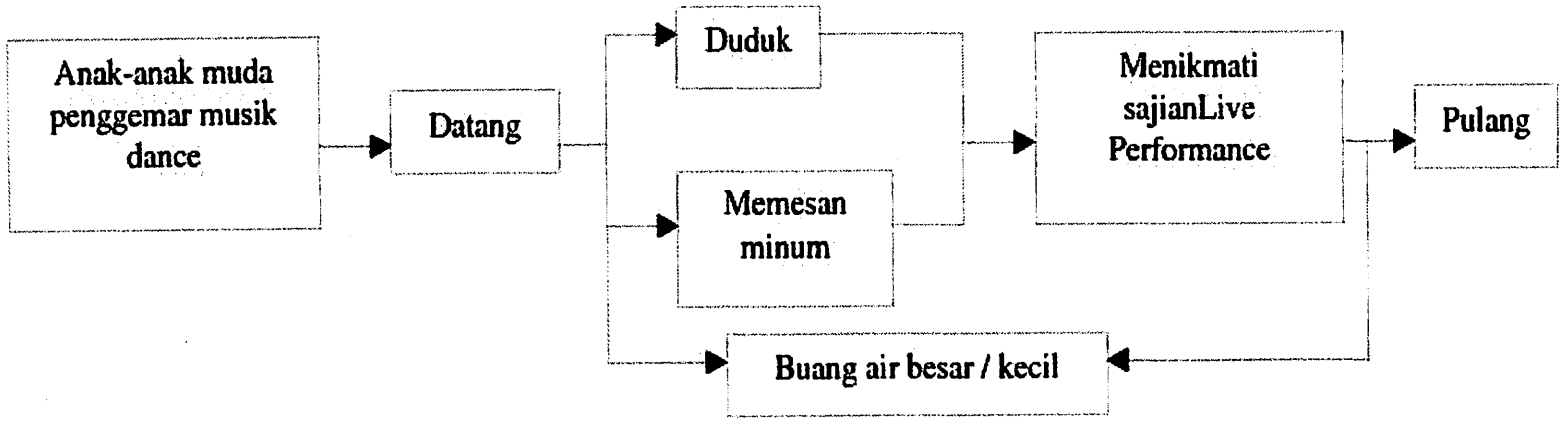
- Pola Aktivitas DJ Pemula



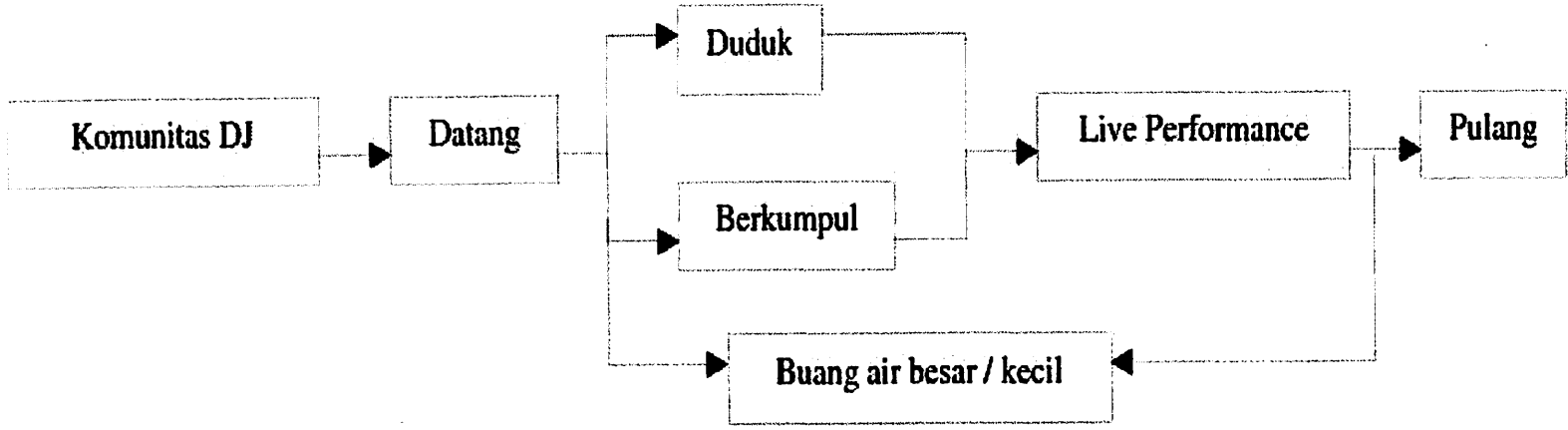
- Pola Aktivitas *Waitress*

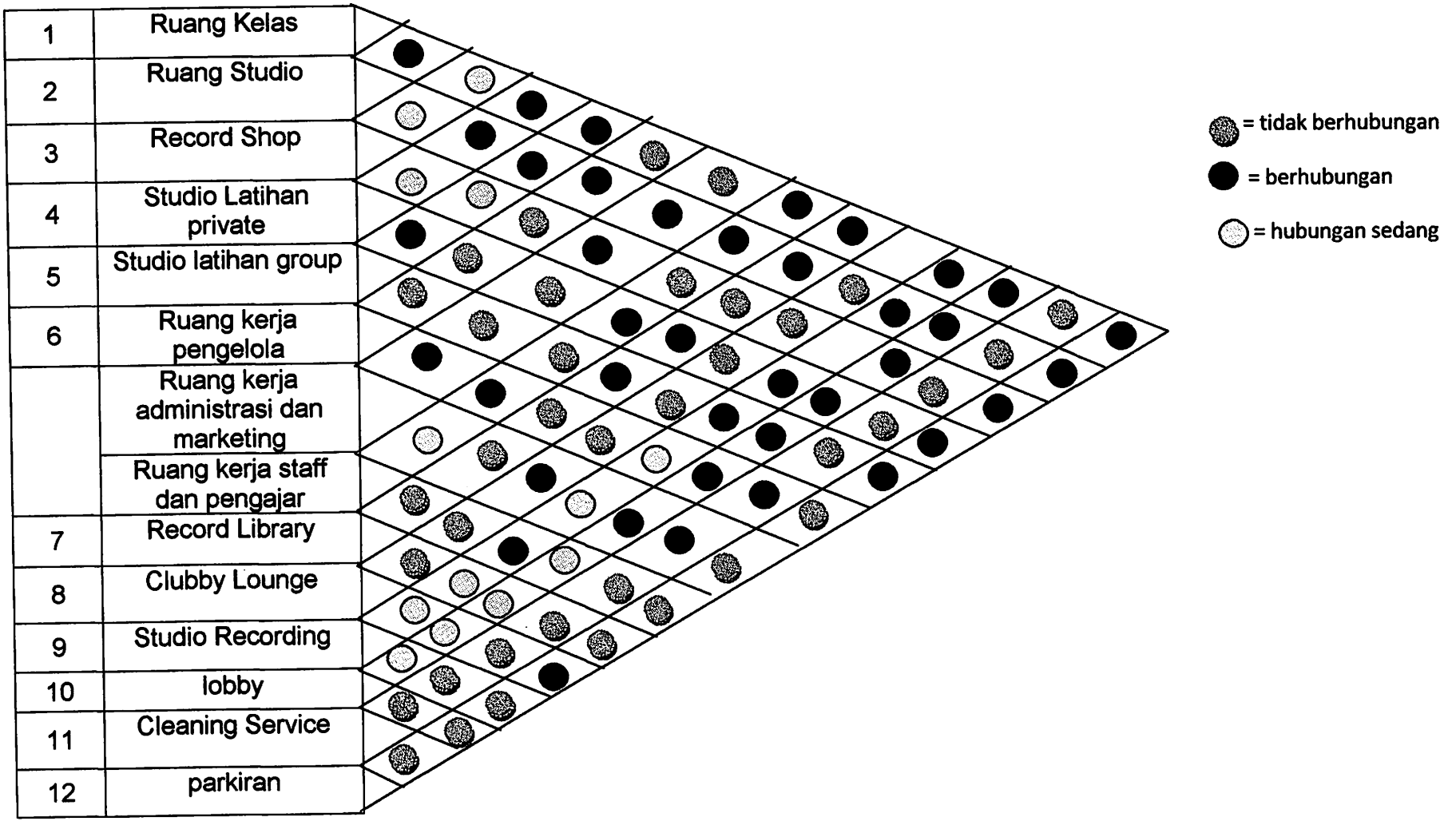


- Pola Aktivitas Anak Muda Penggemar Musik *Dance*



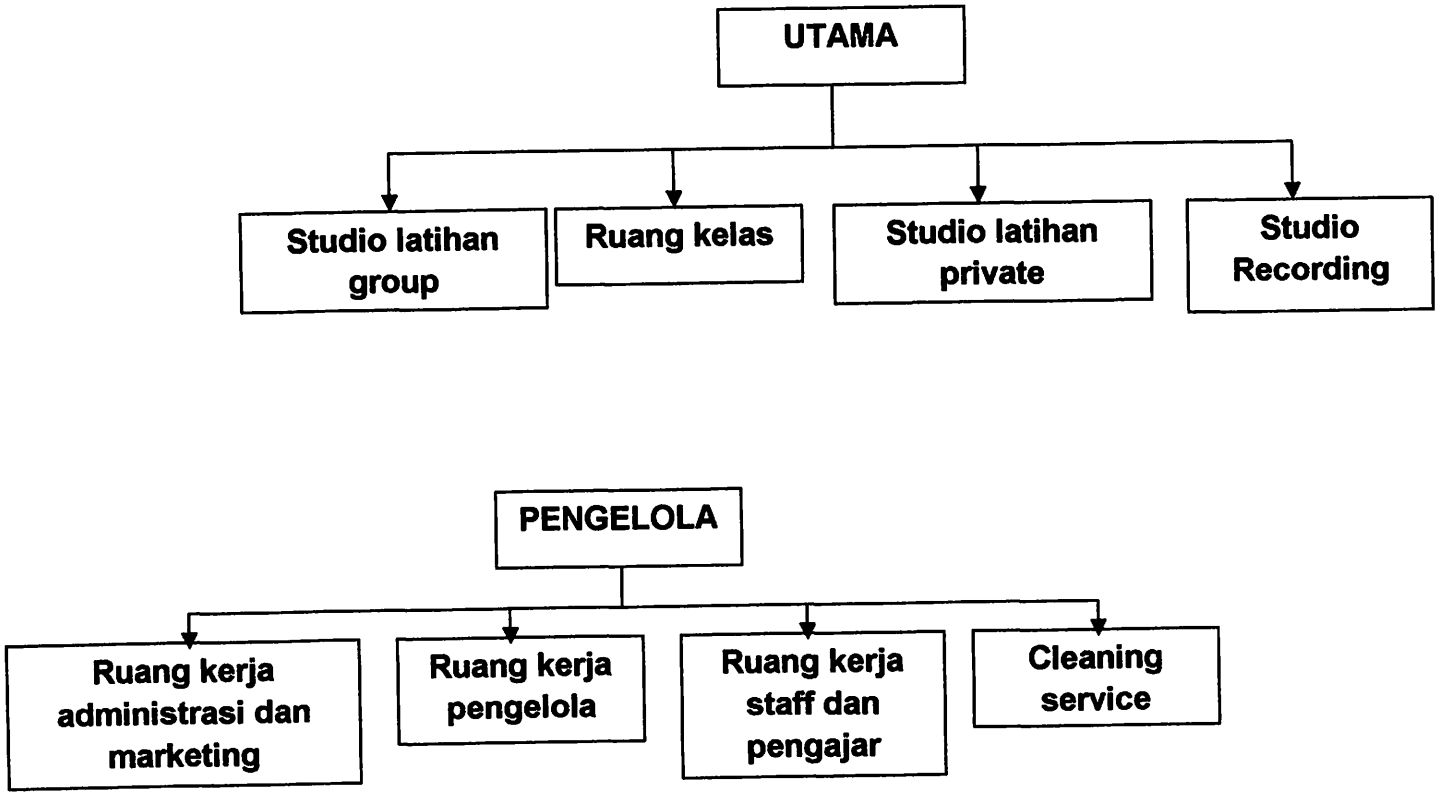
- Pola Aktivitas Komunitas DJ

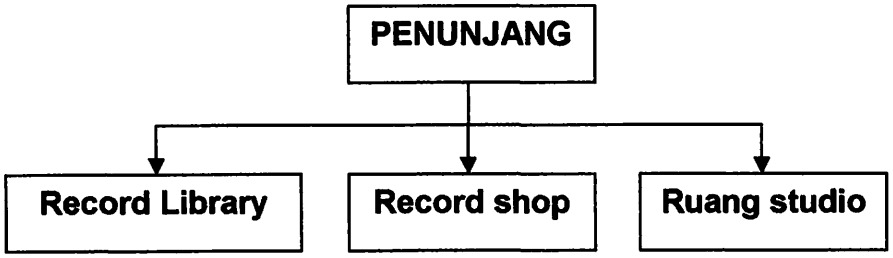


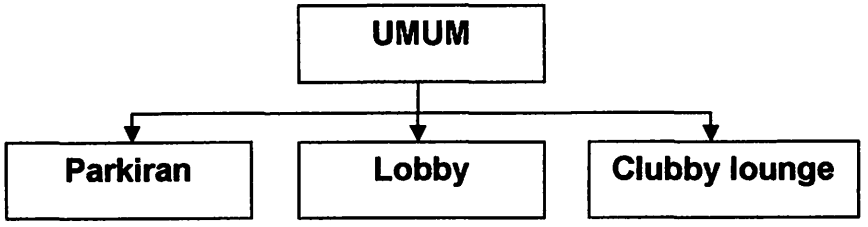


Gambar : hubungan Ruang

6.1.3. Pengelompokan Ruang




PENUNJANG
Record Library
Record shop
Ruang studio


UMUM
Parkiran
Lobby
Clubby lounge

6.1.4. Program Kebutuhan Ruang

NO	Spesifikasi	Pengguna	Aktifitas	Jenis Ruang
1	Ruang Kelas	Siswa dan Pengajar	Belajar dan Latihan	kelas
2	Ruang Studio	Siswa , Pengajar , umum	Latihan mixing	studio
3	Record Shop	Siswa , pengajar , umum	Menjual dan membeli	penjualan
4	Studio Latihan private	Siswa dan Pengajar	Latihan scratching dan mixing untuk 1 orang	Studio private
5	Studio latihan group	Siswa dan pengajar	Latihan scratching dan mixing untuk beberapa orang	Studio group
6	Ruang kerja pengelola	Pemilik	bekerja	Ruang kerja
	Ruang kerja administrasi dan marketing	Staff marketing	Melayani pembayaran, mengatur keuangan	-
	Ruang kerja staff dan pengajar	Pengajar dan staff	Mengajar , mengatur jadwal dan mengatur aktivitas siswa	-
7	Record Library	Pengajar dan siswa	Menyimpan alat untuk siswa	Ruang penyimpanan alat
8	Clubby Lounge	umum	Santai, berkumpul, mendengarkan music	Cafe
9	Studio Recording	Siswa level 5 dan umum	Merekam hasil mixing.	Recording
10	lobby	Siswa , pengajar , umum	Menerima tamu	Receptionist
11	Cleaning Service	Staff security	Menyimpan alat kebersihan , menjaga keamanan	Gudang

12	parkiran	Siswa , Pengunjung , Pengajar , umum	Memarkir kendaraan bermotor	parkiran

Dari 13 jenis spesifikasi pada bagian-bagian yang akan dirancang, dengan adanya aktifitas yang dihasilkan pada bagian tadi akan ditemukan jenis ruang apa saja yang akan ada di sekolah Disc Jockey ini.

6.1.5. Analisa Besaran Ruang

1. Ruang Kelas/10 orang : a. kursi dan meja = 5.1 m2 /per orang (B)

b. Meja Alat = 1,5 m x 1 m = 1.5 m2 (s)

c. jumlah siswa per kelas = 10 orang

sirkulasi = 66 m2 x 30% = 15.6 m2

Total per ruang = 66 m2 + 15.6 m2 = 81.6 m2

Jumlah untuk 15 ruang = 20 x 81.6 = **1461 m2**

(keterangan: (B) = The Architect's Handsbook edited by Quentin Pickard. (S) = Survey)

2. Ruang Studio : a. kursi dan meja = 5.1 m2 /per orang (B)

b. meja alat = 1.5 m x 1 m = 1.5 m2 (s)

c. sound = 1 m x 1 m = 1 m2 (s)

sirkulasi = 7.6 m2 x 30% = 2.28 m2

total per ruang = 7.6 m2 + 2.28 m2 = 9.88

total ruang studio untuk 40 unit = 962 m2

(keterangan: (B) = The Architect's Handsbook edited by Quentin Pickard. (S) = Survey)

3. Record Shop : a. Meja Display tinggi (t1) = 0.60 m x 1.2 m = 0.72 m2

b. Meja Display Rendah (t1) = 0.76 m x 2 m = 1.52 m2

c. Kasir (s) = 1 m x 2 m = 2 m2

total ruang = (0.72 x 10 unit) + (1.52 x 10 unit) + 2 m = 24.4 -> 24 m2

sirkulasi = 24 m2 x 30% = 7.2 m2

total ruang = 24 m2 + 7.2 m2 = 31.2 m2 -> **31 m2**

(keterangan: (t1) = Ernst neufert arsitektur data jilid 3. (S) = Survey)

4. Studio Latihan private : a. kursi dan meja = 5.1 m2 /per orang (B)

b. meja alat = 1.5 m x 1 m = 1.5 m2 (s)

c. sound = 1 m x 1 m = 1 m2 (s)

Total : 5.1 m2 + (1.5 m2 x 2 unit) + 1 m2 = 9.1 m2 -> 9 m2

sirkulasi : 9 m2 x 30% = 2.7 m2

Total besaran Ruangan = 9 m2 + 2.7 m2 = 11.7 m2 -> **12 m2**

5. Studio latihan group : a. kursi dan meja = 5.1 m2 /per orang (B)

b. meja alat = 1.5 m x 1 m = 1.5 m2 (s)

c. sound = 1 m x 1 m = 1 m2 (s)

Total : (5.1 m2 x 10 orang) + 1.5 + 1 m2 = 53.5 m2

Sirkulasi : 53.5 m2 x 30% = 16 m2

Total ruangan = 53.5 m2 + 16 m2 = 69.5 m2 -> 69 m2 (1 ruangan)

Total Jumlah untuk 10 ruangan = 36 m2 x 10 ruangan = **360 m2**

(keterangan: (B) = The Architect's Handsbook edited by Quentin Pickard. (S) = Survey)

6.Ruang Kerja: a. Ruang Kerja Pengelola = meja-kursi 1.8 m x 1.8 m = 3.24 m2 (B)

= lemari file 0.4 m x 0.6 m = 0.24 m2 x 2 unit = 0.48 m2 (t1)

Sirkulasi 30% = 3.72 x 30% = 1.1 m2

Total = 3.72 m2 + 1.1 m2 = **4.82 m2**

(keterangan: (B) = The Architect's Handsbook edited by Quentin Pickard. (t1) = Ernst neufert arsitektur data jilid 3)

b. Ruang Kerja administrasi = 4.80 m2 x 5.00 m2 = 24 m2 (2 0rang) (t1)

jumlah pegawai asumsi yaitu = 40 pegawai / 2 x 24 m2 = 480 m2

Total luasan Ruang = **480 m2**

(keterangan: (t1) = Ernst neufert arsitektur data jilid 3)

c. Ruang Kerja Staff dan pengajar untuk 4 orang + sirkulasi

2 pegawai = 1.87 m x 5 m = 9.35 m2 untuk 1 pegawai = 9.35 m2 / 2 = 4.67 m2

Total luasan ruang untuk 10 orang pegawai = 4.67 m2 x 10 pegawai= **46.7 m2**

d.Wc / Km = 2 m x 3 m = 6 m2 → jumlah total untuk 5 Wc / Km = 6 m2 x 5 = **30 m2**

Total Ruang Kerja = 4.82 m2 + 480 m2 + 46.7 m2 + 30 m2 = 561.62 m2

7. Record Library: a. Lemari penyimpanan alat = 5 m x 1 m = 5 m2 (s)

Untuk 5 unit = 5 m2 x 5 unit = 25 m2

b. Meja dan Kursi Kasir = 1.63 m x 1.56 m = 2.54 m2

Total Perabot = 25 m2 + 2.54 m2 = 27.54 m2

Sirkulasi = 27.54 m2 x 30% = 8.26 m2

Total Ruang = 27.54 m2 + 8.26 m2 = 35.8 m2 -> **36 m2**

(sumber dari Ernst neufert arsitektur data jilid 3)

8. Clubby Lounge :

a. meja dan kursi untuk 4 orang + sirkulasi → 1.50 m x 1.82 m = 2.73 m2 (t1)

50 unit → 2.73 m2 x 50 unit = 136.5 m2 → **136 m2** (t1)

b. Meja dan kursi untuk 2 orang sirkulasi → 0.80 m x 0.62 m = 0.49 m2 (t1)

50 unit → 0.49 m2 x 50 unit = **24.5 m2** (t1)

c. meja Bartender dan perabot + sirkulasi → 2.35 m x 3.25 m2 = **7.63** m2 (t1)

d. Meja alat Dj untuk 4 CDJ + 1 Mixer → 3 m x 1 m = 3 m2 (Survey)

Sirkulasi → 3 m2 x 30% = 0.9

Total → **3.09 m2**

e. Wc / Km → 2 m x 1.5 m = 3 m2 (asumsi)

5 unit → 3 m2 x 5 unit = **15 m2**

Total Luasan Ruang = 136 m2 + 24.5 m2 + 7.63 m2 + 3.09m2 + 15 m2 = 186 m2

(Keterangan: (t1) Emst neufert arsitektur data jilid 3)

9.Studio Recording :

a. kursi dan meja = 5.1 m2 /per orang (B)

b. meja alat = 1.5 m x 1 m = 1.5 m2 (s)

c. sound = 1 m x 1 m = 1 m2 (s)

d. Meja Komputer = 1.4 m x 0.53 m = 0.74 m2 (t1) +

total = 8.34 m2

Sirkulasi 30% = 8.34 m2 x 30% = 2.5 m2

Total = 8.34 m2 + 2.5 m2 = 10.84 m2 → 11 m2

Jumlah Studio yang ada : 11 m2 x 10 unit = 110 m2

(keterangan: (B) = The Architect's Handsbook edited by Quentin Pickard.(s) = Survey)

10. Lobby : a. Meja dan Kursi receptionis = 1.56 m x 1.63 m = 2.54 m2 (t1)

b. Kursi tamu untuk 1 orang = 0.8 m x 0.6 m = 0.48 m2 (asumsi)

kursi tunggu untuk 5 orang = 0.48 m2 x 5 Kursi = 2.4 m2

Total = 2.54 m2 + 2.4 m2 = 4.94 m2 → 5 m2

Sirkulasi = 30 % x 5 m2 = 1.5 m2

Total Luasan = 5 m2 + 1.5 m2 = **6.5 m2**

(Keterangan: (t1) Ernst neufert arsitektur data jilid 3)

11.Service : a. Ruang mesin = 10 m x 5 m (studi banding)

= 50 m^2 → 50 x 30% = 15 m^2

Jadi 50 m^2 + 15 m^2 = 65 m^2

b. Ruang cleaning service = 2 m x 3 m = 6 m2

c. Gudang = 3 m x 3 m = 6 m2

Total Luasan = 65 m2 + 6 m2 + 6 m2 = **77 m2**

12.Parkiran : a. Mobil : @ mobil BMW 5 series = 4.42 m x 1.68 m = 7.42 m2

Dengan 45 derajat 2 arah dengan lebar jarak antar mobil 5.50 m

Luas area parkir untuk 2 mobil dengan 2 arah yaitu :

(7.42 x 2 unit) + 5.50 = 20.34 m2 jadi untuk 1 mobil = 20.34 / 2 = 10.18 m2

Total luasan parkiran untuk 20 mobil =20 unit x 10.18 m2 = **203.60 m2**

b. Sepeda Motor : @ 2.25 m x 0.75 m = 1.68 m2

Dengan 45 derajat 2 arah dengan lebar jarak antar motor 2.5 m

Luas area parkir untuk 2 motor dengan 2 arah yaitu :

(1.68 m2 x 2 unit) + 2.5 m = **5.86 m2** jadi untuk 1 motor = 5.86 / 2 = 2.93 m2

Total Luasan Parkiran untuk 30 motor = 2.93 m2 x 30 unit = 87.9 m2 → **88 m2**

Total Luasan pakiran : 203.60 m2 + 88 m2 = 291.6 m2

(sumber dari Ernst neufert arsitektur data jilid 3)

Dari analisa diatas jadi luasan yang akan direncanakan di area site nanti yaitu :

Total : 1632 + 2500 + 31 + 12 + 360 + 561.62 + 36 + 186 + 110 + 6.5 + 77 + 291.6 = 5803.72 → 5804 m2

6.2. Analisa Site

Lokasi site yang diusulkan di dalam proses perancangan Sekolah Disc Jockey berada di kota Malang. Adapun pertimbangan-pertimbangan yang mendasari pemilihan lokasi site ini adalah karena kota Malang merupakan salah satu kota yang berpotensi untuk pengembangan fasilitas-fasilitas seperti halnya tempat penjualan maupun tempat pamer alat-alat musik.

Adapun data-data dan wilayah administratif site:

- Luas site : 18.736 m²
- Kelurahan : Mojolangu
- Kecamatan : Lowokwaru
- Batas sebelah utara : Perum Griya Shanta
- Batas sebelah selatan : Ruko Soekarno-Hatta
- Batas sebelah timur : Perumahan warga
- Batas sebelah barat : Ruko Soekarno-Hatta

6.2.1. Analisa Vegetasi

Ada beberapa vegetasi yang sudah eksisiting pada lokasi site dan sekitarnya. Di sekitar lokasi site terdapat beberapa pohon palm yang tertata pada koridor jalan menuju lokasi site. Seperti yang terlihat pada gambar di bawah ini. Pohon palm memang sangat cocok dengan kondisi site dan keadaan sekitar lokasi site.

Selain pohon palm juga ada beberapa deretan pohon

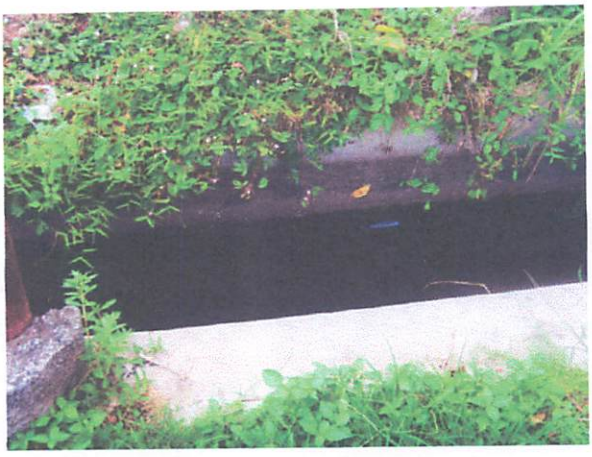
Pohon palm yang terdapat pada pedestrian jalan raya Soekarno-Hatta tersebut dapat dimanfaatkan sebagai tanaman pembatas, dan akan tetap dipertahankan kelestariannya. Pohon tersebut juga menjadi citra kawasan sepanjang jalan arteri tersebut.

6.2.1. Sirkulasi Lalu Lintas

Terdapat tiga macam sirkulasi:

- Pergerakan manusia, cenderung menuju ke arah kantor-kantor dan perguruan tinggi yang terdapat di ujung jalan tersebut, seperti Politeknik Negeri Malang, Universitas Brawijaya, ITN Malang, UIN Malang, dan beberapa universitas tinggi lainnya. Pejalan kaki memanfaatkan pedestrian yang terdapat disepanjang jalan tersebut.
- Kendaraan pribadi yang melintas baik dari arah pasar Blimbing maupun dari arah kota bergerak menuju dan meninggalkan kota.
- Beberapa kendaraan umum melintasi jalan tersebut bergerak cenderung menuju ke arah kota dan beberapa instansi pendidikan.
- Sering terjadi kemacetan terutama pada daerah yang terdapat di sekitar tapak, jika terdapat berbagai macam acara di Taman Krida Budaya.

6.2.2. Utilitas Lingkungan



Gambar di atas menunjukkan sistem buangan air kotor dan air hujan yang berasal dari perumahan warga dan jalan perumahan serta jalan arteri Soekarno-Hatta. Selokan tersebut memiliki kedalaman berkisar antara 50-60 cm, dapat dimanfaatkan untuk sistem buangan air kotor dari bangunan music centre. Sistem buangan air kotor tersebut disalurkan secara langsung menuju riol kota.

6.3. Analisa Struktur

Pemilihan struktur dan konstruksi berpengaruh besar dalam perancangan sekolah khusus disc jockey, yaitu sebagai bentuk kerangka dasar pembentuk ruang dan sebagai pendukung dan penyalur beban yang ada.

Penentuan Struktur berdasarkan hasil dari ide bentuk yang telah di tetapkan pada proses analisa bentuk. Dari proses analisa bentuk yang telah disesuaikan, struktur pada bangunan sekolah khusus disc jockey mengikuti masa bangunan/pola Linier.

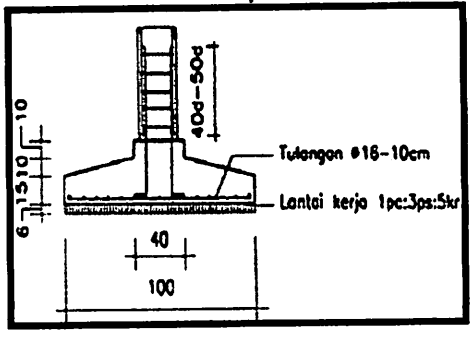
Bangunan sekolah khusus disc jockey ini menggunakan Sistem struktur dari bagian badan bangunan menggunakan sistem rangka, yang terdiri dari pelat lantai, balok, dan kolom yang tersusun beraturan, saling tegak lurus. Dan beban / gaya vertikal dan horizontal disalurkan melalui tiang / kolom untuk disalurkan menuju fondasi. Sistem rangka ortogonal menggunakan sistem tiga lapis (thre layer) pelat lantai yang didukung oleh balok-balok anak yang ditumpu oleh balok induk yang menyalurkan bebannya ke kolom.

Perencanaan struktur pada sekolah khusus disc jockey dengan menggunakan model struktur modern, hal ini dikarenakan untuk menunjang fasilitas yang diterapkan di dalamnya.

6.3.1 Sub Struktur

Pada perancangan sekolah khusus disc jockey, struktur bawah yang di gunakan adalah pondasi Foot Plat yang Merupakan bagian kaki bangunan yang berfungsi menyalurkan beban bangunan ke tanah.

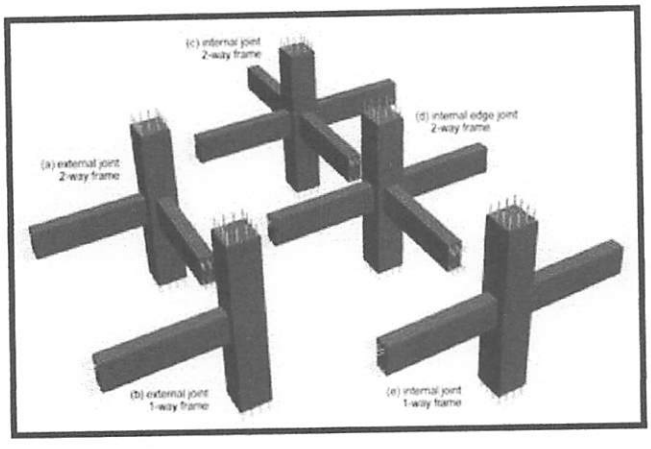
Pondasi foot plat



Gambar 6.26 pondasi footplat

6.3.2. Main Struktur

Merupakan bagian badan bangunan dimana terdapat dinding, kolom, balok, plat lantai yang merupakan kerangka utama bangunan. Struktur yang dibentuk dengan cara meletakkan elemen kaku horisontal di atas elemen kaku vertikal adalah struktur yang umum dijumpai. Elemen horizontal (balok) sering disebut sebagai elemen lentur, yaitu memikul beban yang bekerja secara transversal dari panjangnya dan mentransfer beban tersebut ke kolom vertikal yang menumpunya.



Gambar 6.27 Rangka kaku

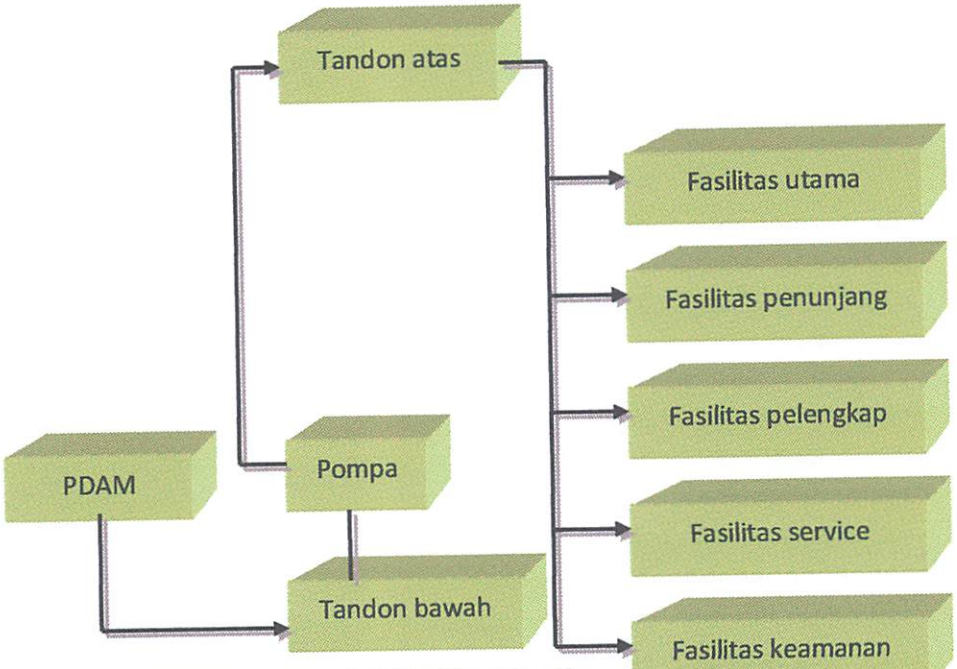
6.3.3. Upper Struktur

Pada Bagian atap di sesuaikan dengan bentukan yang ada pada ide bentuk pada tahap analisa bentuk. Dari analisa bentuk yang ada struktur atap menggunakan Dag Betton.Selain kemampuan memenuhi fungsinya, dalam memilih atap perlu juga dipertimbangkan soal estetika. Atap dikatakan baik jika memenuhi tiga hal, yaitu: komposisi, skala, dan keindahan itu sendiri. Keseluruhan bahan struktur atapnya menggunakan **Dag** untuk memperoleh bentuk yang diinginkan sekaligus memberikan kesan modern secara eksterior dan interior.

6.4. Analisa Utilitas

6.4.1. Distribusi air bersih

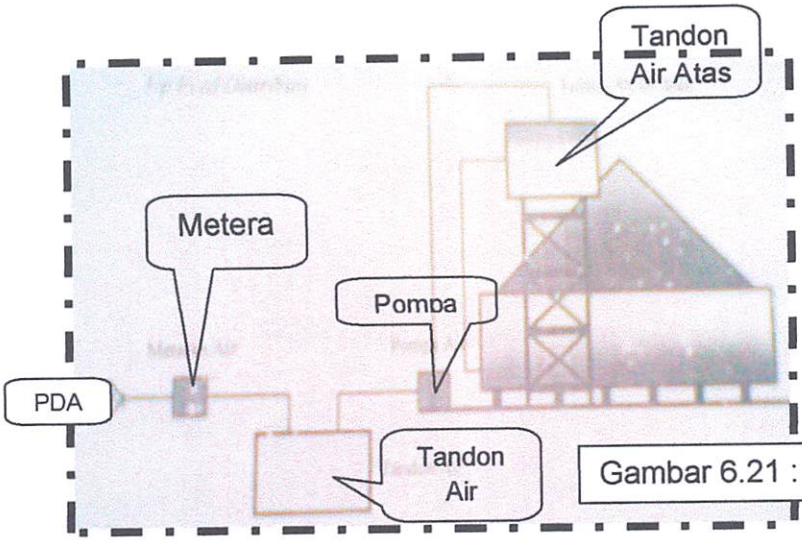
Air bersih yang digunakan di dalam Sekolah Khusus Disc Jockey bersumber dari PDAM yang ditampung di tandon bawah. Dari tandon bawah, air dipompa menuju ke tandon atas dan kemudian di distribusikan kembali ke daerah bangunan fasilitas utama. Untuk daerah bangunan yang fungsinya sebagai fasilitas penunjang seperti, fasilitas servis,fasilitas kemanan dan fasilitas umum lainnya air juga didistribusikan dengan cara yang sama.



Gambar 6.20 Skema Distribusi Air

Untuk Hydran, sprinkler, penyiraman taman dan fasilitas lainnya sistim penggunaan buatan (AC) dan kebutuhan gedung dan penggunaannya, maka cara pengalirannya seperti berikut

:

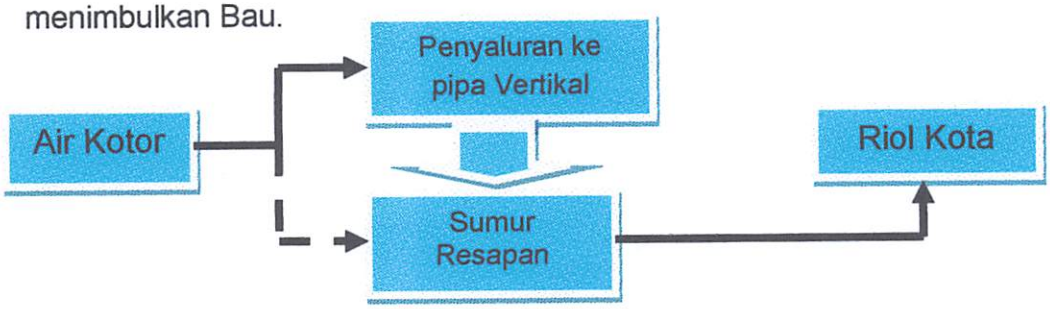


Gambar 6.21 : Distribusi Air

- Keuntungan menjamin kelancaran distribusi air terutama pada saat listrik padam
- Kerugian, Resevoir di atas berat sehingga perlu perancangan struktur yang efesiensi.
-

6.4.2. Distribusi Air Kotor

Disalurkan melalui pipa vertical yang ada di dalam shaft ke suatu bak control sebelum di salurkan ke Riol Kota, melalui saluran tertutup agar tidak menimbulkan Bau.

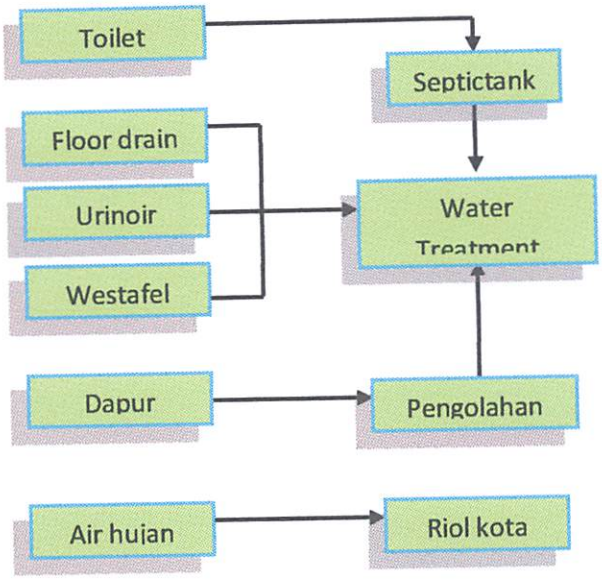


Gambar 6.22 Distribusi air Kotor

Untuk system pembuangan air kotor, kotoran dari toilet diuraikan menjadi *black water* sadangkan dari urinoir, westafel dan floor drain diuraikan menjadi *grey water.* Untuk *black water* sendiri disalurkan menuju ke septictank dengan kemiringan pipa 2 % dan jarak maksimum pipa ± 15 m. Dari septictank *black water* tadi kemudian disalurkan

lagi ke sumur resapan atau menuju ke unit pengolahan limbah Bangunan Sekolah Khusus Disc Jockey. Sedangkan untuk *grey water*, air kotor lansung di buang menuju sumur resapan atau unit pengolahan limbah bangunan Sekolah Khusus Disc Jockey.

Untuk pembuangan air hujan, aliran air diarahkan menuju riol kota yang aliran airnya menuju ke Sungai.



Gambar 6.23
Skema Air kotor

Skema Pembuangan Air Kotor

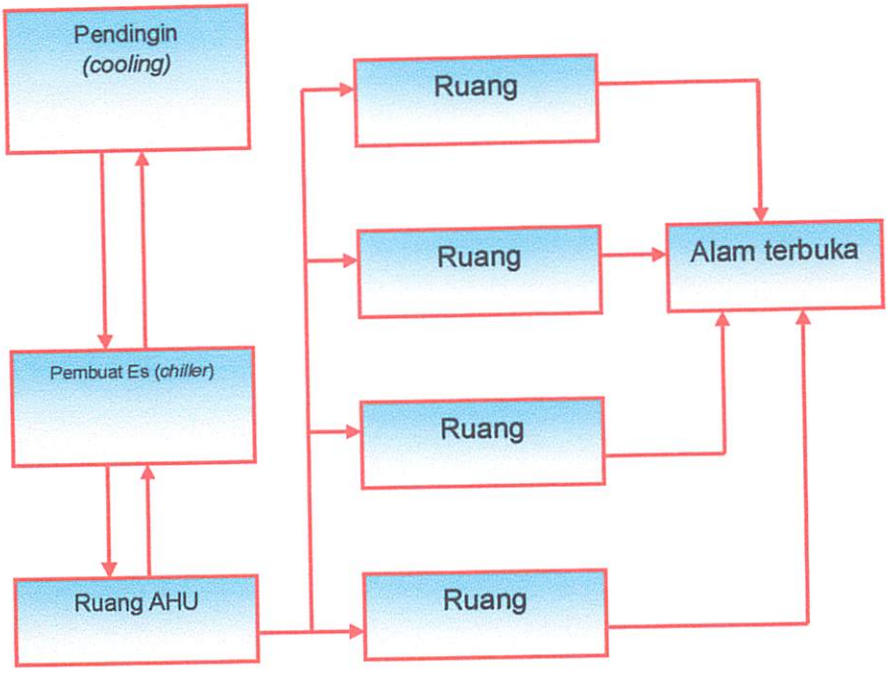
6.4.3. Fire Protector

Smoke Detectore

Alat ini ditempatkan pada langit-langit ruangan dan akan memberi tanda berupa sirine pada Sekolah Khusus Disc Jockey jika sensornya menangkap asap, panas atau api. Jenis – jenis detectore antara lain *Smoke Detectore* atau pengindra asap, *Heat Detectore* atau pengindra panas, dan *Fire Detectore* atau pengindra api.

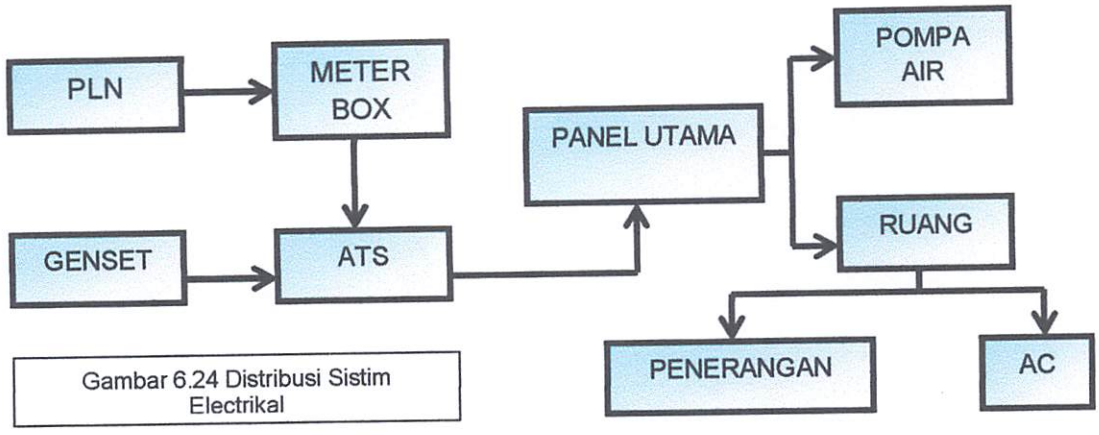
6.4.4. Sistim Penghawaan

System penghawaan yang digunakan yaitu sitem penghawaan alami dan buatan. Penghawaan alami digunakan pada ruangan yang berhubungan langsung dengan ruang terbuka, seperti pada Fasilitas Utama Bangunan Sekolah Khusus Disc Jockey



6.4.5. Sistim Electrikal

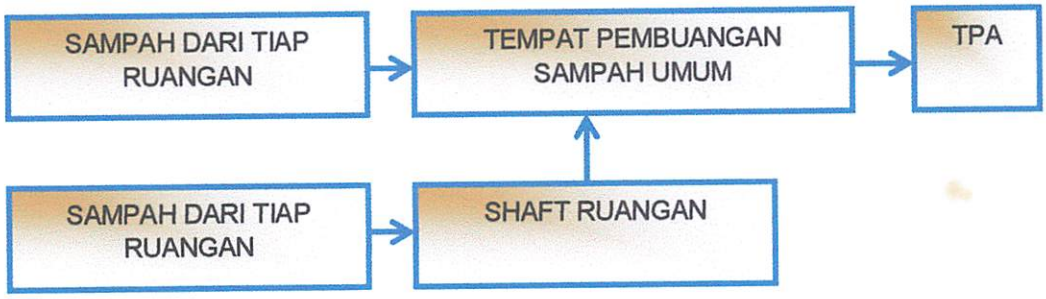
Listrik yang didapat bersumber dari PLN dengan back-up gengzet. Sumber daya tegangan menengah yang diambil dari genzet pada gardu yang terpisah dekat dari bangunan Galeri Seni Rupa diubah dengan menggunankan trafo menjadi tegangan rendah 220 Volt. Setelah itu listrik tadi disalurkan menuju panel utama dan kemudian disalurkan lagi ke kontrol-panel control panel yang mengatur pengeluaran dan tegangan listrik pada satu cabang bangunan, dan kemudian didistribusikan ke semua unit yang membutuhkan tenaga listrik.



Gambar 6.24 Distribusi Sistim Electrikal

6.4.6. Sistim Pembuangan Sampah

Untuk pembuangan sampah digunakan sistem carry out. Dimana pada setiap harinya ada petugas kebersihan (karyawan) yang akan membersihkan setiap bangunan kemudian samphnya dikumpulkan di tempat pembuangan sementara dalam bangunan kemudian diangkut menuju TPA kota. Untuk penyaluran sampah dalam bangunan secara vertical digunakan shaft.



6.4.7. Sistem Komunikasi

Beberapa sistem komunikasi yang digunakan dalam bangunan:

- Sistem komunikasi internal : terdiri dari Intercom (sistem komunikasi 2 arah).
- Sistem komunikasi external : yaitu sistem komunikasi yang digunakan untuk berhubungan diluar bangunan yaitu: telepon, Internet, HT, Radio.

BAB VII

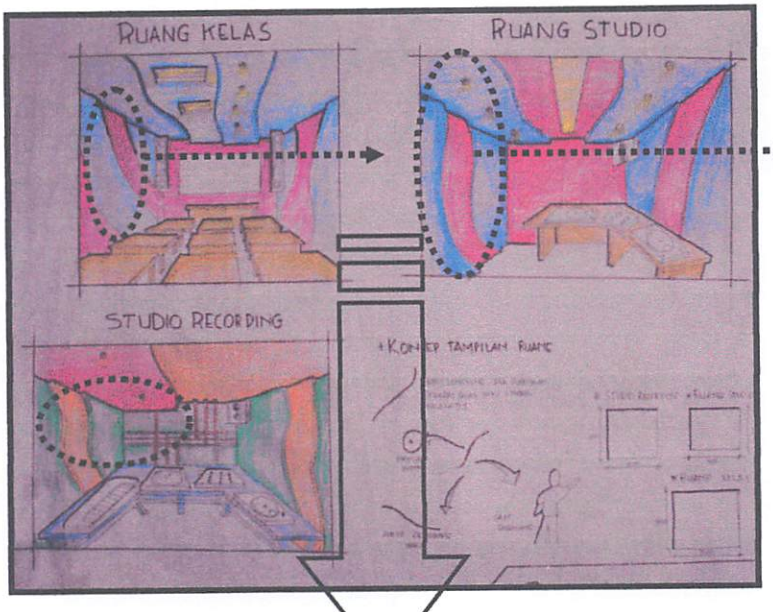
KONSEP PERANCANGAN

Pembahasan mengenai kesimpulan yang berasal dari hasil analisa akan dijadikan sebuah acuan untuk membuat konsep perancangan. Dari hasil analisa tersebut yang meliputi analisa ruang, analisa tapak dan analisa bentuk, akan diperoleh sebuah keterkaitan antara ruang, tapak, dan bentuk.

7.1 Konsep Ruang

Konsep ruang merupakan hasil dari analisa mengenai suatu kegiatan yang ada di selolah musik DJ beserta kegiatan penunjang. Adanya aktifitas, dimensi manusia, dan kapasitas akan menentukan suatu bentuk ruang yang .Pada dasarnya konsep penataan ruang koleksi harus memiliki kemudahan dalam merubah pola penataan antara ruang baca dan ruang koleksi.

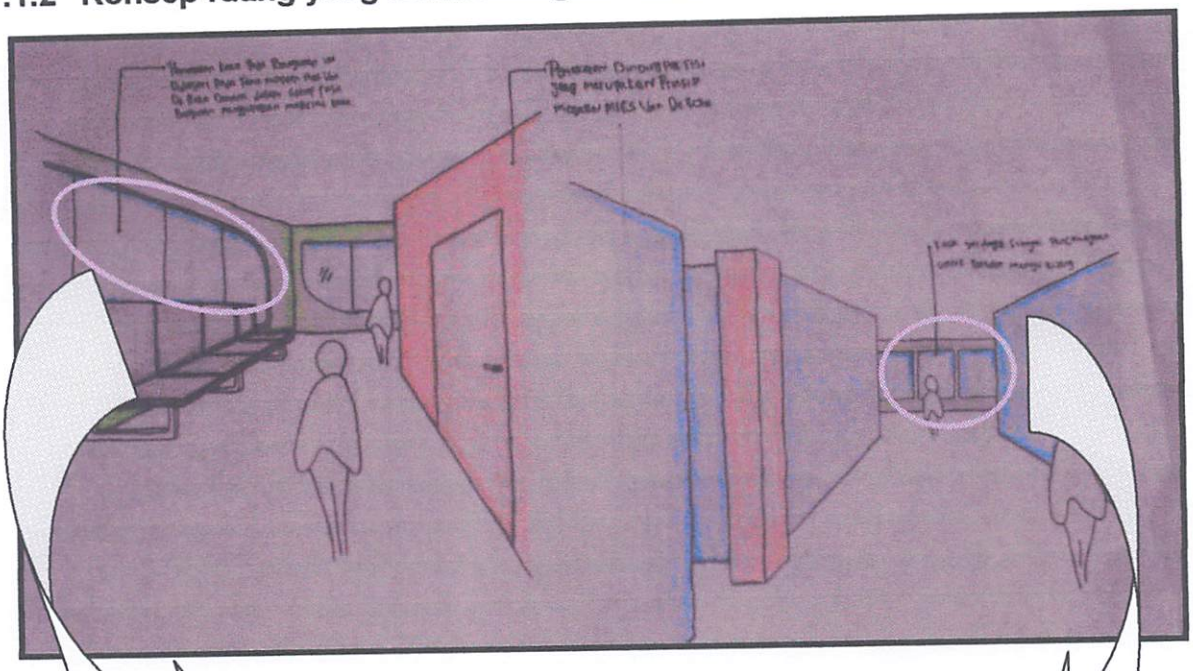
7.1.1 Konsep Ruang Studio Reccording, Ruang Kelas, dan Ruang Studio



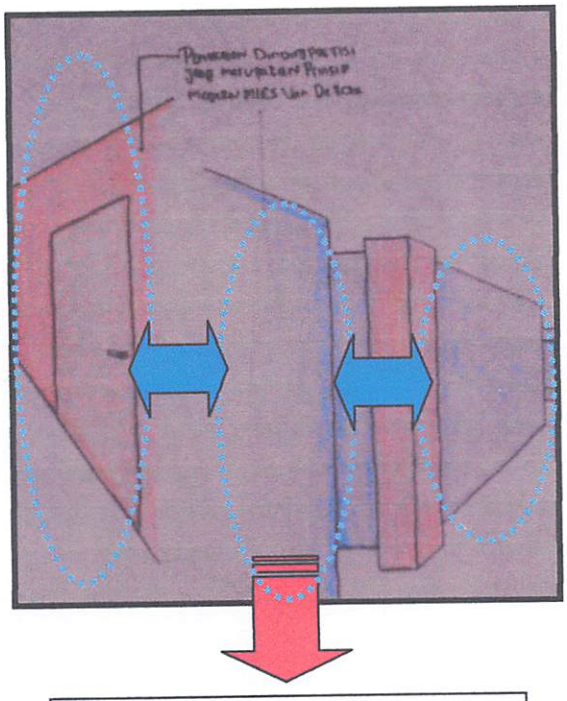
Unsur garis Lengkung yang bias diartikan Sebagai salah satu symbol dalam DJ.

Keterkaitan Ruang sangat berpengaruh terhadap bunyi music yang berada dalam ruang kelas, studio dan recording.

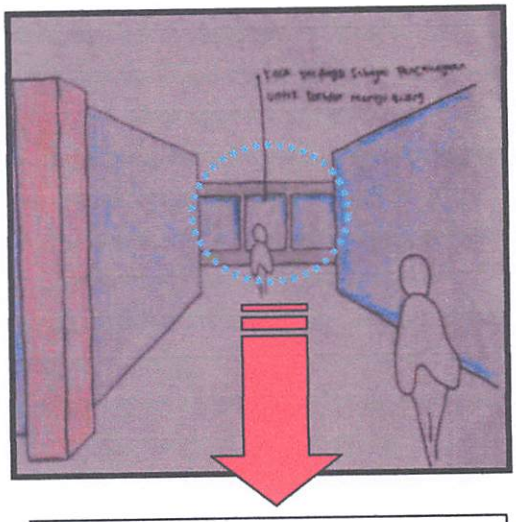
7.1.2 Konsep ruang yang terkait dengan Tema



Peralatan Kaca pada bangunan yang didasari pada Tema Modern dengan menyerap bunyi, dimana dalan setiap fasa bangunan mengunakan material kaca.



Penekana dinding partisi yang merupaka Prinsip modern Mies Van Deroe.



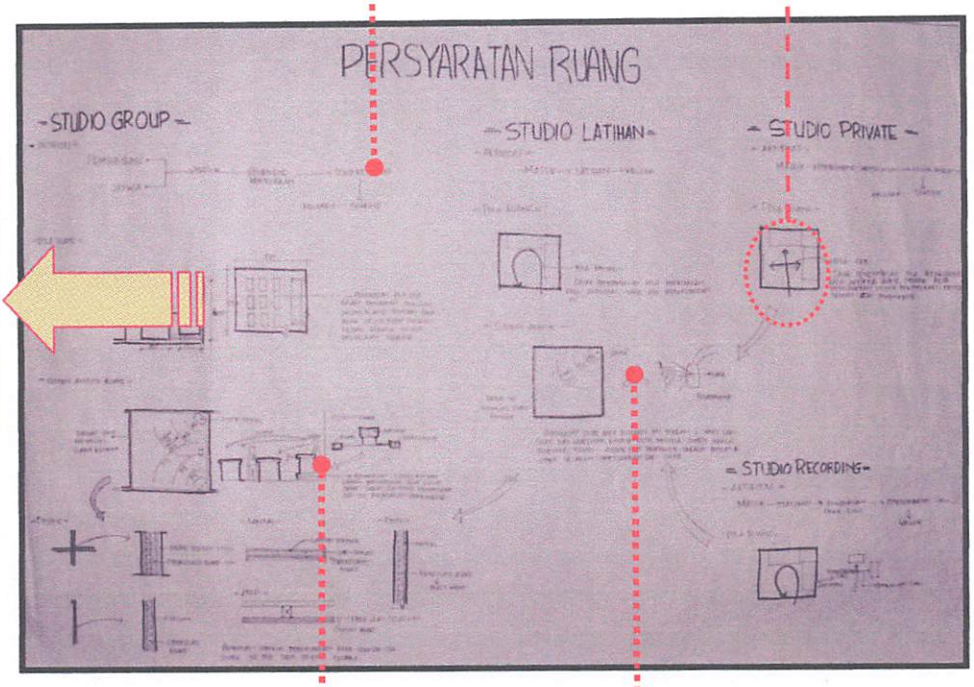
Kaca Yang Berfungsi sebagai pencahayaan untuk koridor ruang tunggu.

7.1.3 Konsep Persyaratan Ruang

Konsep persyaratan ruang yang di buat sesuai dengan keterkaitan tema modern mies Van daroe yang di terapkan dalam fasade bangunan.

Dasar pengambilan pola berdasarkan pada aktifitas ruang, dimana agar memudahkan siswa berinteraksi dengan teman atau pembimbing.

nggunaan tinggi
dahnya lantai agar
wa dapat lebih
mpang mendengar
a yang di bicarakan
h pembimbing.



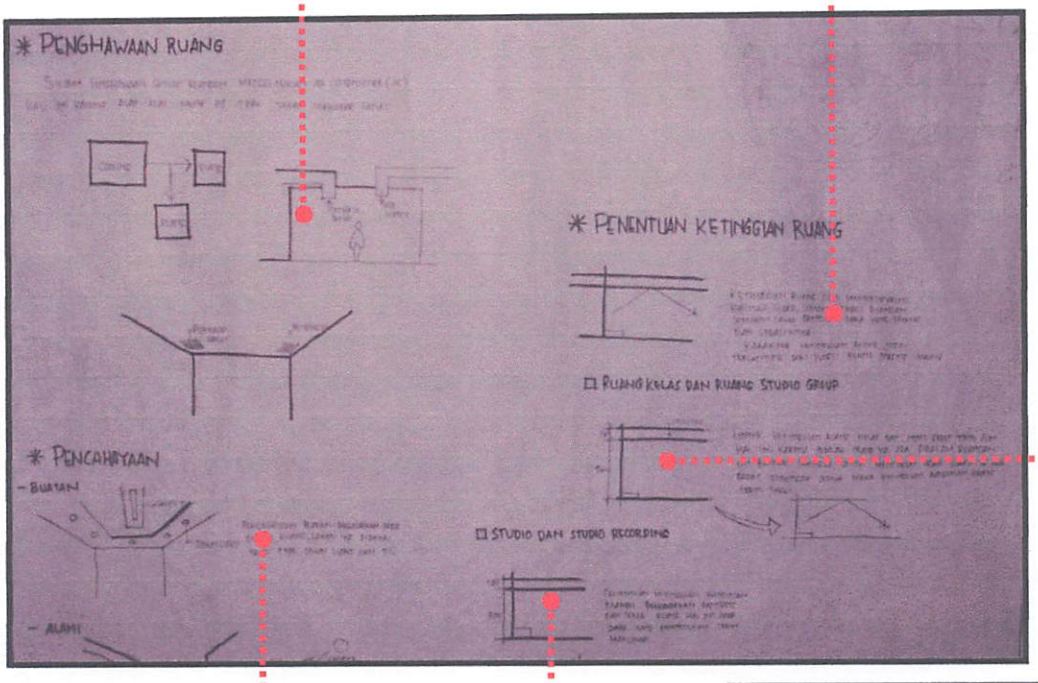
Penentuan material berdasarkan pada suara yang ada pada dinding tersebut .

Pemakaian sound dari rangkaian ini terbagi menjadi 2 yaitu sound dari headphone. Dimana setiap fungsi memiliki pengatur tempo dan juga pengatur suara dari sound.

7.1.4 Konsep Penghawan dan Pencahayaan

Sistim penghawaan setiap ruangan menggunakan AC (Air Conditioner) Hal ini karena alat music di dalam ruangan tidak tahan panas.

Ketinggian ruangan juga mempengaruhi kualitas suara, semakin tinggi ruangan semakin lama pantulan suara yang dating dan sebaliknya.



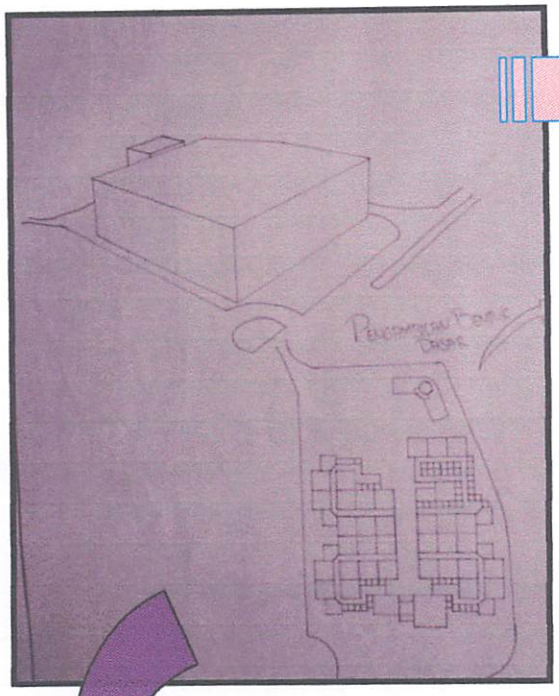
Untuk ketinggian ruang kelas dan studio di pengaruhi oleh jumlah siswa yang ada di dalam ruangan ini agar suara yang ada dapat di dengar oleh semua.

Karakter ketinggian ruang juga di pengaruhi oleh ketinggian fungsi masing-masing ruang.

Penentuan ketinggian diambil berdasarkan panjang dan lebar ruangan ini, agar suara yang dipantulkan semakin maksimal.

7.2 Konsep Bentuk

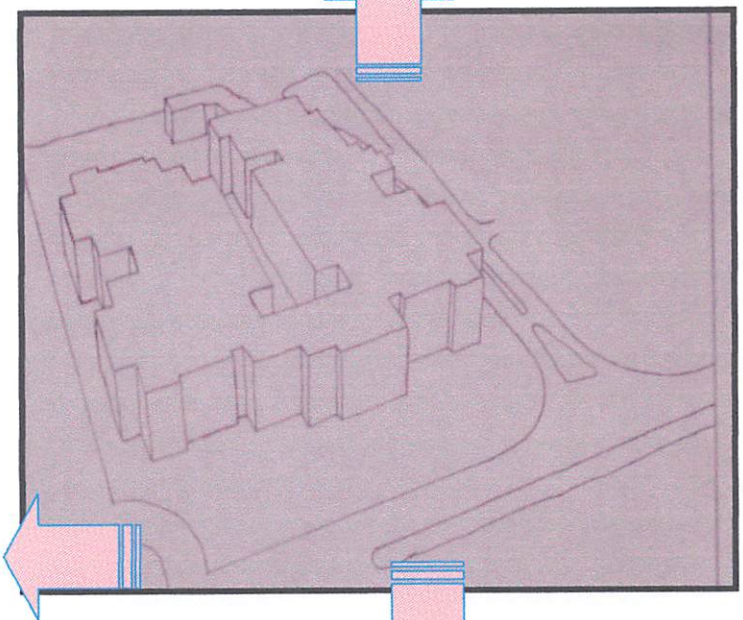
7.2.1 Bentuk dasar



Bentuk 1

Pengambilan bentuk angunan berdasarkan bentuk dasar bangunan berupa persegi panjang yang kemudian mengalami pengurangan dan penambahan bentuk yang mengikuti fungsi ruang pada Bangunan Sekolah music DJ

Bentuk 2

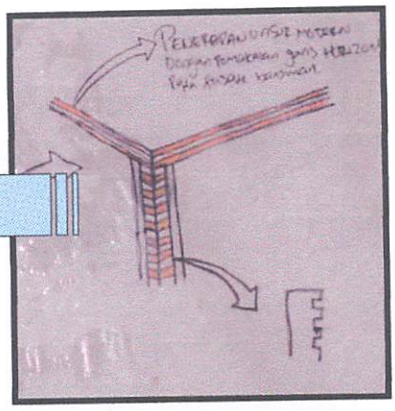


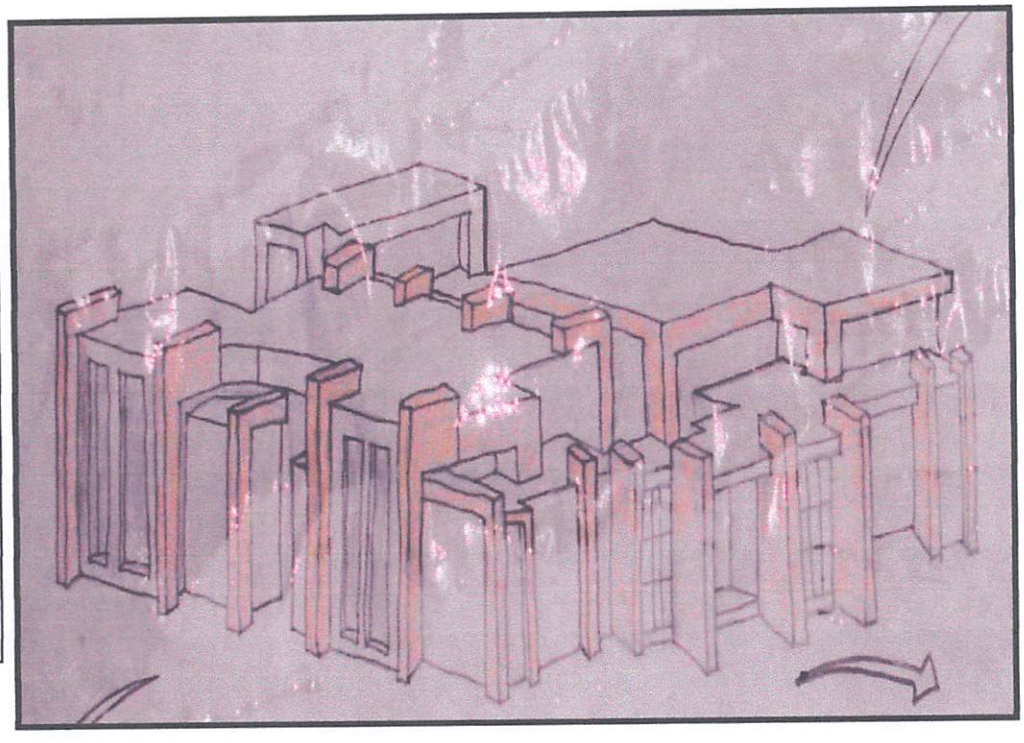
Tahapan pengolaha bentuk dari penambahan dan pengurangan dari bentuk dasar yang dikomposisikan menjadi bentuk bangunan yang modern sesuai dengan keterkaitan tema.

Pengolahan Bentuk dari Bentuk dasar Bangunan berdasarkan fungsi ruang yang diterapkan sebagai bentuk banguna sekolah DJ.

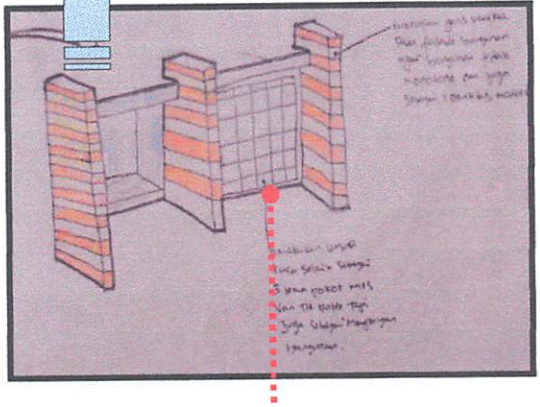
7.2.2 Visualisasi Bentuk

Penerapan unsure modern dengan penggunaan garis horizontal pada fasade bangunan

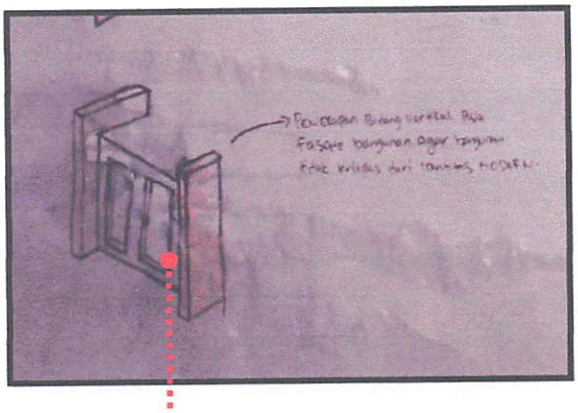




Penggunaan garis vertical pada fasade banggunan agar bangunan tidak monoton dan juga sebagai identitas modern.



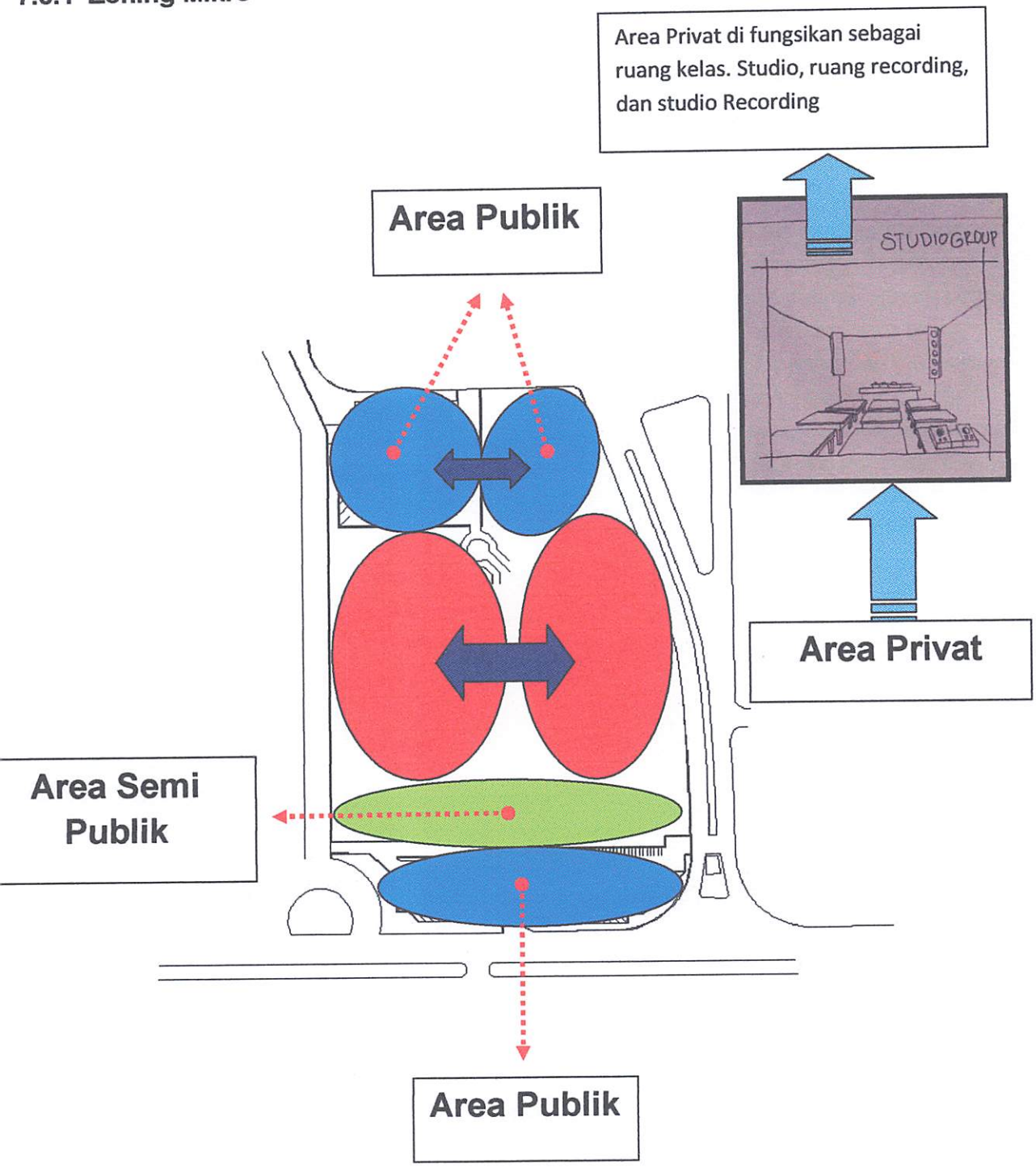
Penggunaan unsure kaca sebagai tema pokok tema Mies Van de Rohe, tapi juga sebagai unsure pencahayaan pada bangunan



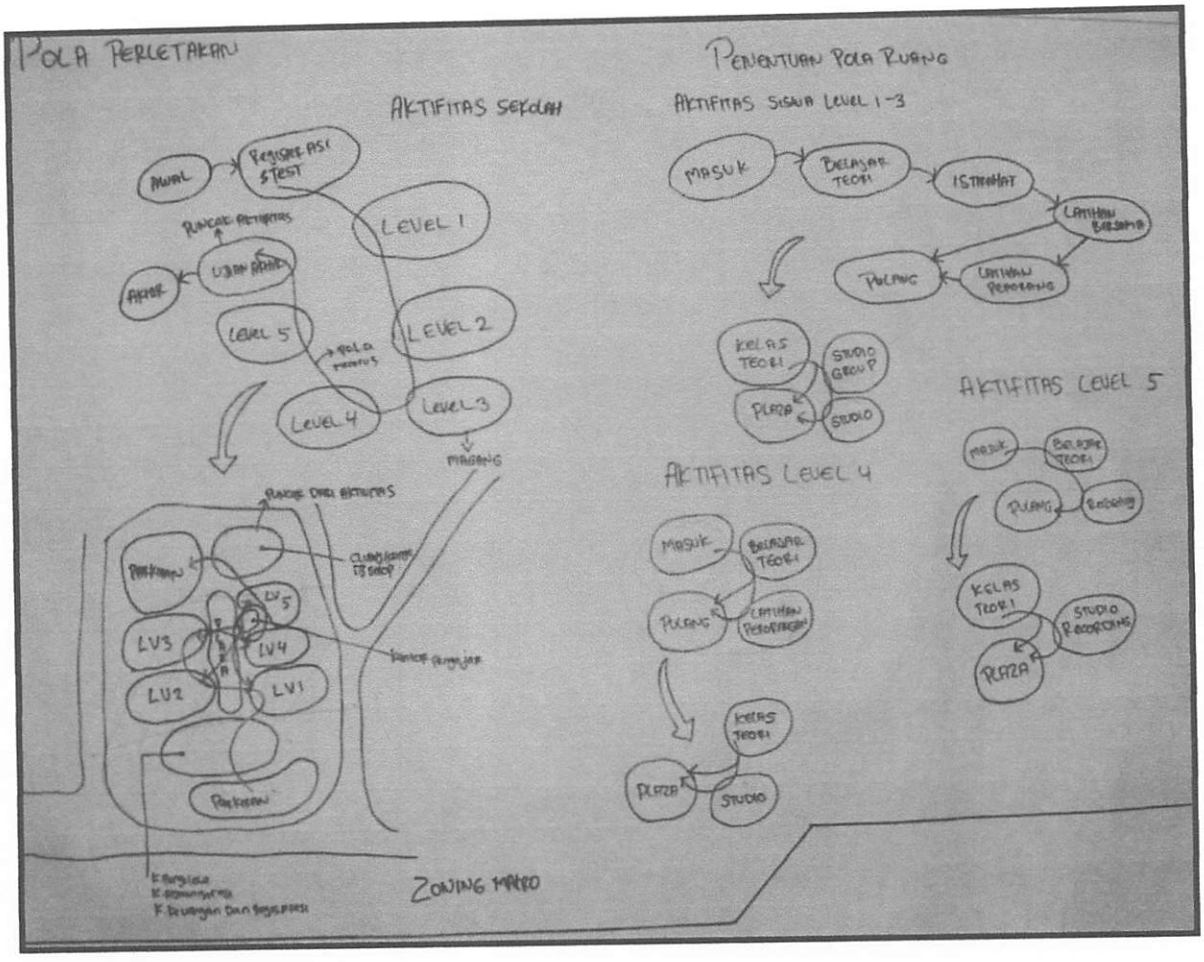
Penerapan bidang vertical pada vasade bangunan agar bangunan tidak terlepas dari identitas modern

7.3 Konsep Zoning

7.3.1 Zoning Mikro



7.3.2 Zoning Mikro



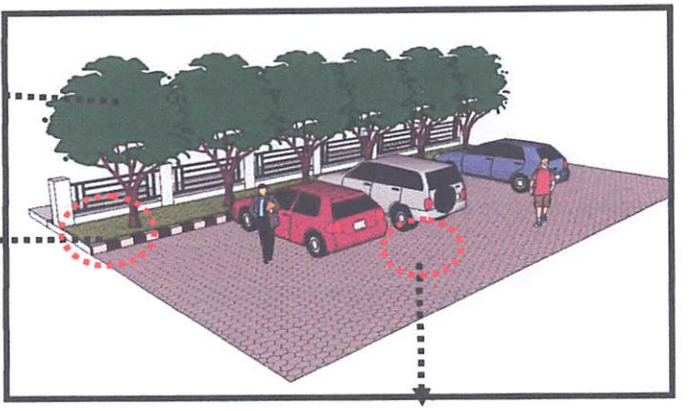
Gambar Zoning Mikro pada Bangunan Sekolah musik DJ

7.3 Konsep Parkiran

7.4.1 Tempat parkir mobil (roda 4)

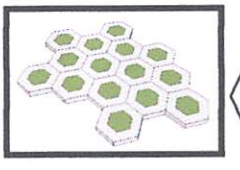
Parkir kendaraan dengan sudut 90 derajat akan memudahkan sirkulasi kendaraan masuk dan keluar parkir sehingga tidak menimbulkan suara-suara bising yang dapat mengganggu kenyamanan di area privat pada sekolah musik DJ.

Pepohonan yang ditata berderet, penempatan pohon dapat dijadikan unsur peneduh.



Gambar Konsep parkir Mobil.

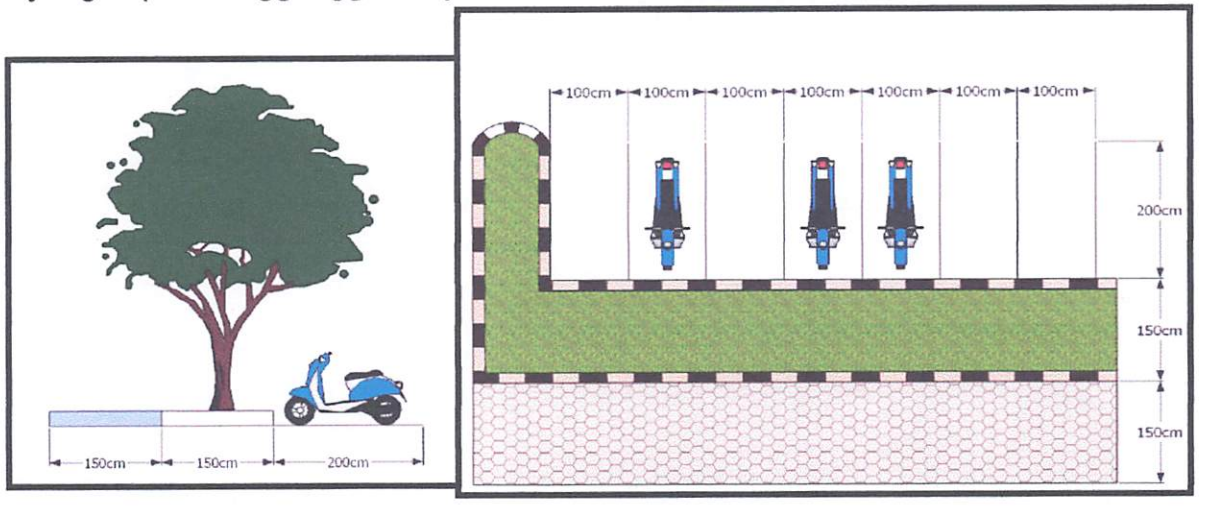
Peninggian bidang pada permukaan tanah dapat membedakan tempat parkir dengan taman .



Desain permukaan parkir menggunakan bahan / material paving blok dengan model berongga dibagian tengah, dimaksudkan agar dapat menyerap air pada saat hujan.

7.4.2 Tempat parkir motor (roda 2)

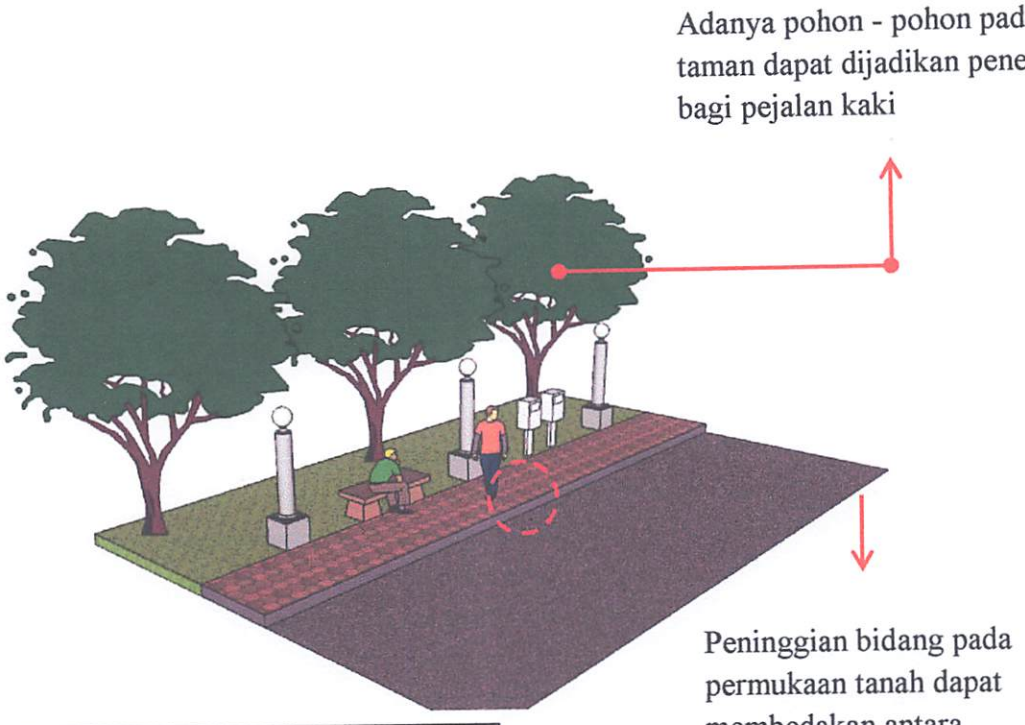
Parkir kendaraan dengan sudut 90 derajat akan memudahkan sirkulasi kendaraan masuk dan keluar parkir sehingga tidak menimbulkan suara-suara bising yang dapat mengganggu kenyamanan Area Sekolah musik DJ.



Gambar potongan *Tampak atas*

Gambar Konsep Parkir sepeda Motor

7.4.3 Sirkulasi pejalan kaki



Gambar Konsep sirkulasi pejalan kaki

7.5 Konsep Struktur

Pemilihan struktur dan konstruksi berpengaruh besar dalam perancangan Sekolah music DJ, yaitu sebagai bentuk kerangka dasar pembentuk ruang dan sebagai pendukung dan penyalur beban yang ada.

Penentuan Struktur berdasarkan hasil dari ide bentuk yang telah di tetapkan pada proses analisa bentuk. Dari proses analisa bentuk yang telah disesuaikan, struktur paa bangunan Sekolah music DJ mengikuti masa bangunan/pola Linier.

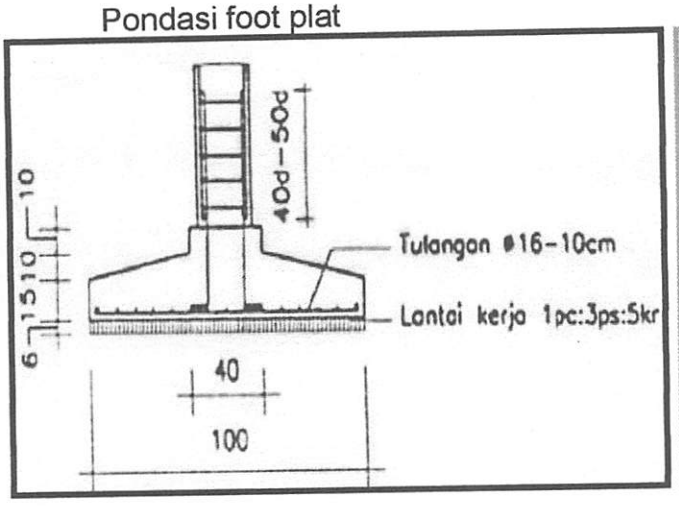
Bangunan Sekolah music DJ ini menggunakan Sistem struktur dari bagian badan bangunan menggunakan sistem rangka, yang terdiri dari pelat lantai, balok, dan kolom yang tersusun beraturan, saling tegak lurus. Dan beban / gaya vertikal dan horizontal disalurkan melalui tiang / kolom untuk disalurkan menuju fondasi. Sistem rangka ortogonal menggunakan sistem tiga lapis (thre layer) pelat lantai yang didukung oleh balok-balok anak yang ditumpu oleh balok induk yang menyalurkan bebannya ke kolom.

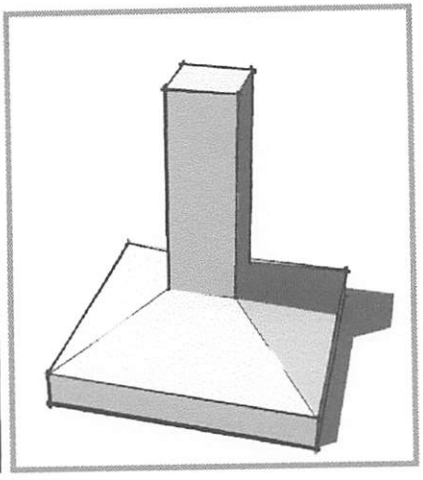
Perencanaan struktur pada Bangunan Sekolah music DJ dengan menggunakan model struktur modern, hal ini dikarenakan untuk menunjang fasilitas yang diterapkan di dalamnya.

7.5.1 Sub Struktur

Pada perancangan Sekolah music DJ, struktur bawah yang di gunakan adalah pondasi Foot Plat yang Merupakan bagian kaki bangunan yang berfungsi menyalurkan beban bangunan ke tanah.

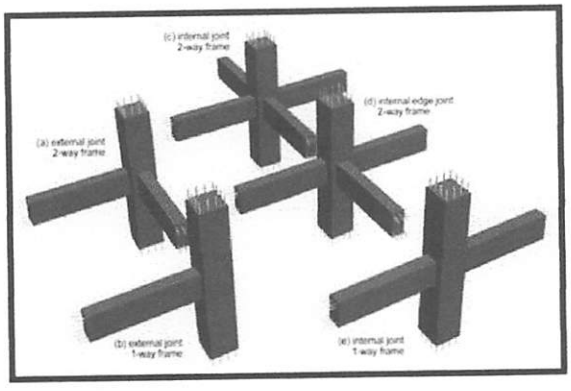
Pondasi foot plat

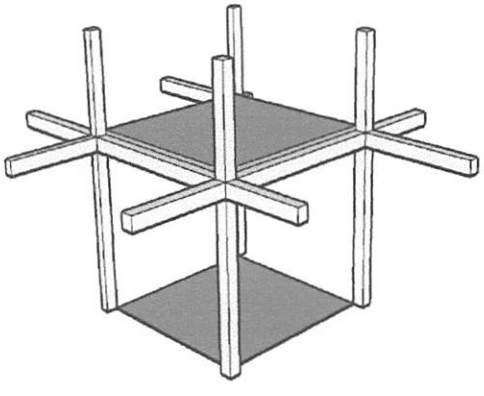




7.5.2 Main Struktur

Merupakan bagian badan bangunan dimana terdapat dinding, kolom, balok, plat lantai yang merupakan kerangka utama bangunan. Struktur yang dibentuk dengan cara meletakkan elemen kaku horisontal di atas elemen kaku vertikal adalah struktur yang umum dijumpai. Elemen horizontal (balok) sering disebut sebagai elemen lentur, yaitu memikul beban yang bekerja secara transversal dari panjangnya dan mentransfer beban tersebut ke kolom vertikal yang menumpunya.

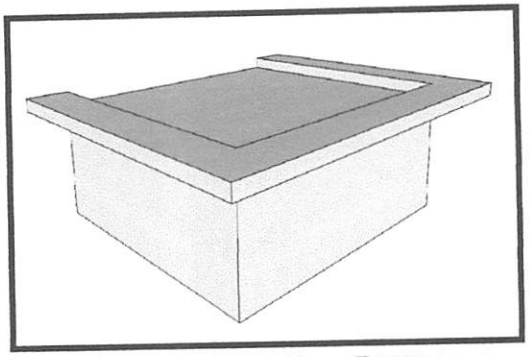




Rangka kaku

7.5.3 Upper Struktur

Pada Bagian atap di sesuaikan dengan bentukan yang ada pada ide bentuk pada tahap analisa bentuk. Dari analisa bentuk yang ada struktur Dag Betton.



Gambar Atap Dag Betton

Selain kemampuan memenuhi fungsinya, dalam memilih atap perlu juga dipertimbangkan soal estetika. Atap dikatakan baik jika memenuhi tiga hal, yaitu: komposisi, skala, dan keindahan itu sendiri. Keseluruhan bahan struktur atapnya menggunakan **Dag Beton** untuk memperoleh bentuk yang diinginkan sekaligus memberikan kesan modern secara eksterior dan interior.

7.6 Konsep Utilitas

7.6.1 Utilitas Lahan

Utilitas Lahan Pada Tapak yaitu berupa saluran drainase, jaringan listrik danjaringan Telepon. Dalam konsep utilitas Lahan saluran pembuangan air kotor langsung menuju ke riel kota dengan sarana drainase yang berada di depan tapak.

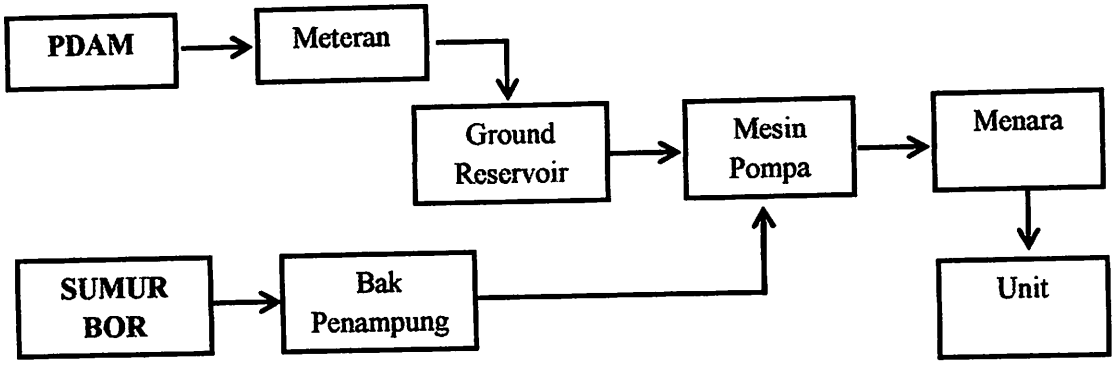
7.6.2 Utilitas bangunan

Dalam konsep utilitas Bangunan saluran air kotor dari Bangunan Sekolah Musik DJ di salurkan ke dalm sumur resapan Bangunan, dan ke mudian hasil dari penyaringan limbah di salurkan ke rieol kota yang berada di depan tapak.Untuk jaringan listrik menggunakan fasilitas Genzet yang berkapasitas sesuai dengan kebutuhan bangunan Sekolah Musik DJ dan kemudian di salurkan ke setiap ruangan Sekolah Musik DJ sesuai dengan

kebutuhannya.Untuk jaringan telepon disampungkan melalui utilitas lahan yang berada di depan tapak.

7.6.3 Sistem Pengadaan Air Bersih

Penyediyaan air bersih berasal dari PDAM, sedangkan untuk cadangan air dipergunakan air dari sumur bor.

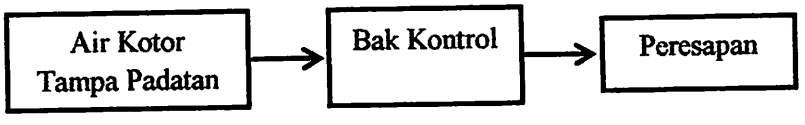


Pendistribusian air bersih

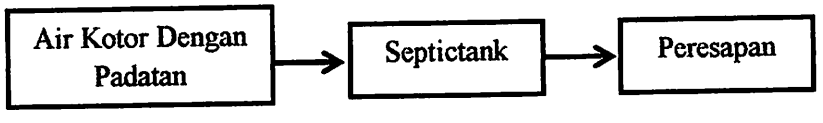
7.6.4 Sistem Pembuangan Air kotor

Air kotor dibagi antara jenis air buangan dan asalnya, antara lain :

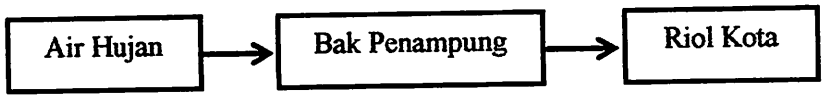
- Air kotor tanpa padatan dari kamar mandi / wastafel



- Air kotor dengan padatan dari kloset



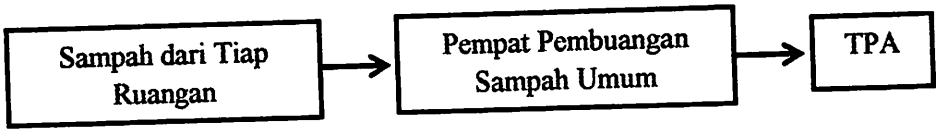
- Air hujan dari tritisan bangunan dan halaman



Sistem pembuangan air kotor

7.6.5 Sistem Pembuangan Sampah

Sampah-sampah yang berasal dari tiap unit bangunan, dibuang ketempat pembuangan sampah umum, yang selanjutnya diangkat Dinas Kebersihan Kota untuk diangkut ke tempat pembuangan akhir / TPA.

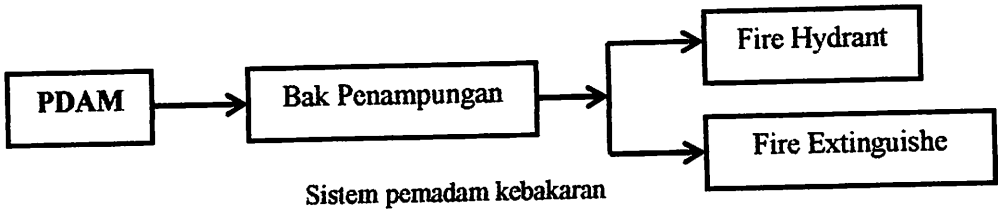


Sistem pembuangan sampah

7.6.6 Sistem Pencegahan dan Pemadam Kebakaran

Beberapa cara penanggulangan dengan cara menggunakan peralatan mekanik yang diletakkan di luar maupun dalam gedung seperti:

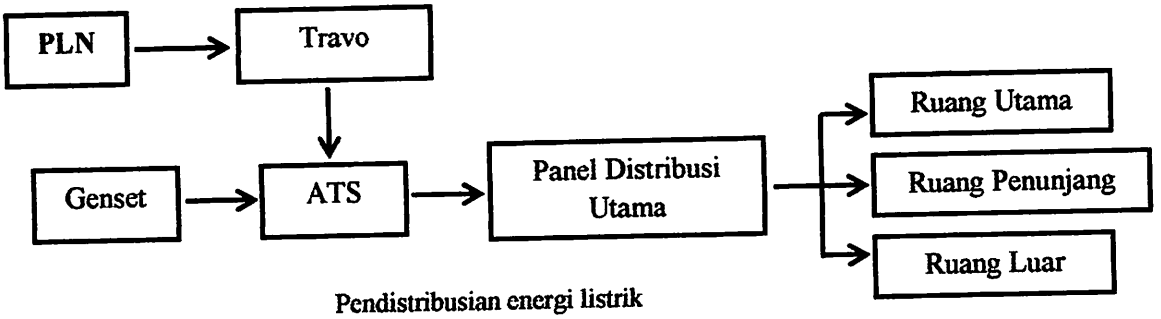
- Fire Hydrant : Diletakkan di luar gedung untuk memadamkan api yang sudah besar. Jarak jangkauan 25 – 30 m dan harus dipertimbangkan penyedian air untuk hydrant.
- Fire Extinguishe : alat pemadam berupa tabung kecil. Ditempatkan pada ruang-ruang yang keberadaannya vital.



Sistem pemadam kebakaran

7.6.7 Sistem Distribusi Listrik

Energi listrik yang akan digunakan berasal dari dua sumber, yaitu PLN sebagai sumber utama dan generator set (genset) sebagai sumber cadangan bila sumber utama mati. Distribusi listrik dapat dilihat pada gambar berikut :

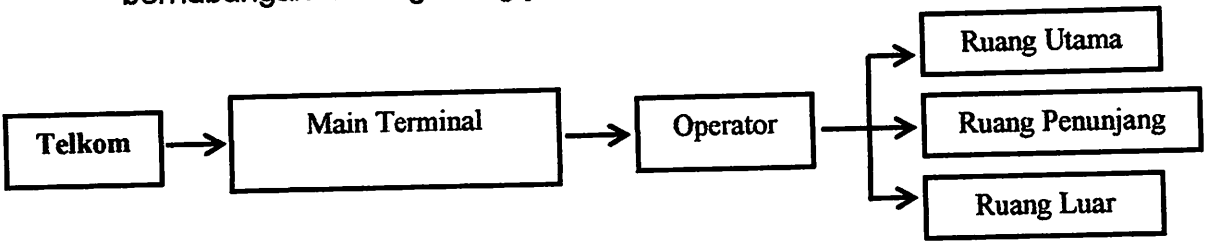


Pendistribusian energi listrik

7.6.8 Sistem Komunikasi

Beberapa sistem komunikasi yang digunakan dalam gedung :

- Sistem komunikasi internal : terdiri dari Intercom (sistem komunikasi 2 arah) dan pengeras suara.
- Sistem komunikasi external : yaitu sistem komunikasi yang digunakan untuk berhubungan diluar gedung yaitu: telepon, Internet, HT, Radio.



Pendistribusian telpon

DAFTAR PUSTAKA

Boushmaha Baiche, Nicholas Wallimen, 2000. Neufert Ernst and Peter Architects Data 3rd edition 2000. Blackweel science Ltd, Germany.

Quentin Pickard, 2002. The Architecture Handbook. Blackweel science Ltd, Germany.

Ensiklopedi Indonesia jilid 5, Jakarta; PT Ichtiar baru , hal 3060.

Kamus Musik, Yogyakarta:Kanisius , hal 25

skripsi Perancangan Interior sekolah Disc Jockey (DJ) di Surabaya, skripsi mahasiswa universitas kristen petra, hal 12

http://www.dv247.com/dj-equipment/pioneer-djm-800-performance-mixer-dj-mixer--36191

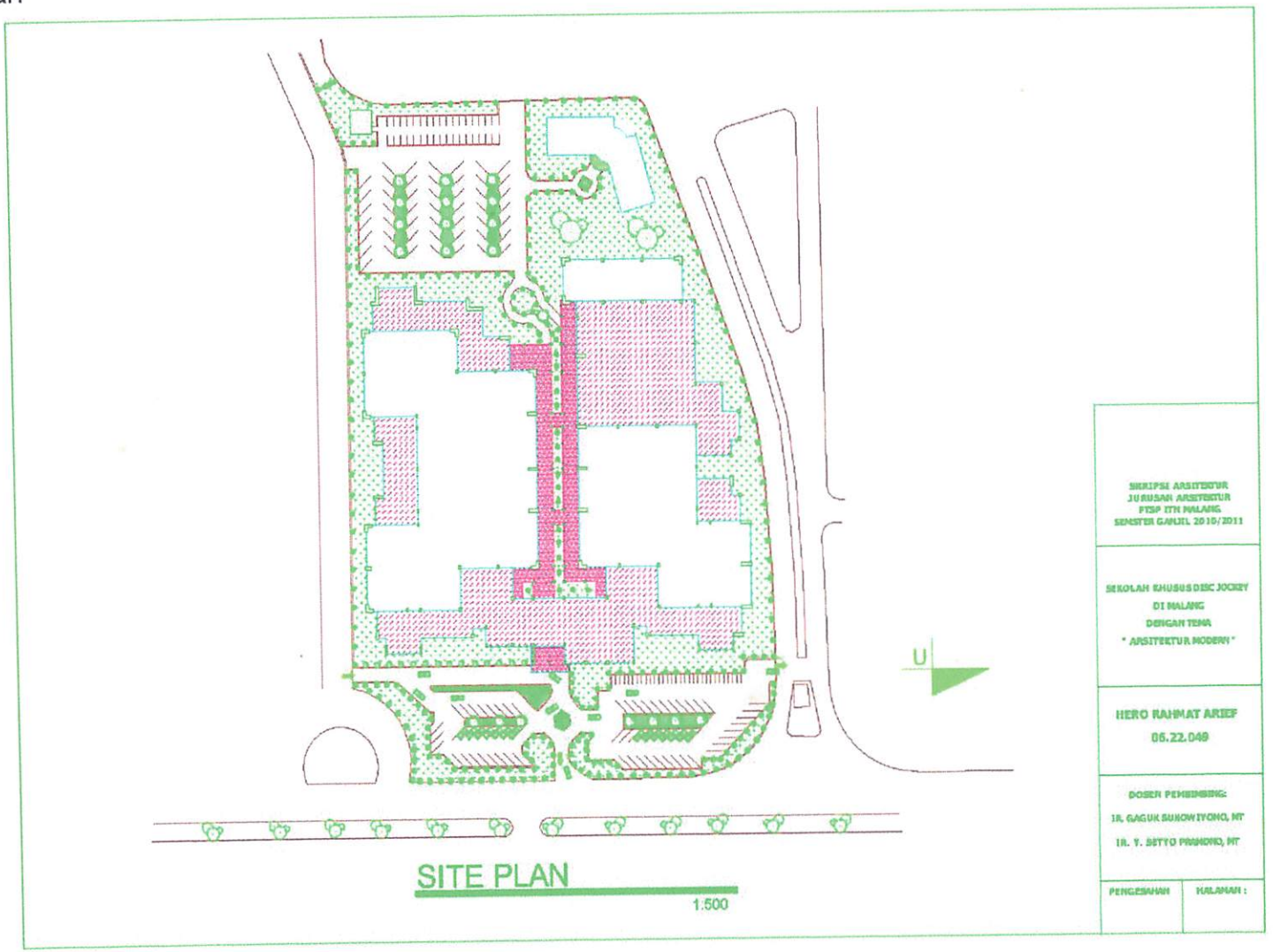
www.schoolofhigherdjing.com

http://www.arsiteka.com/2008/11/mies-van-der-rohe-pelopor-arsitek.html

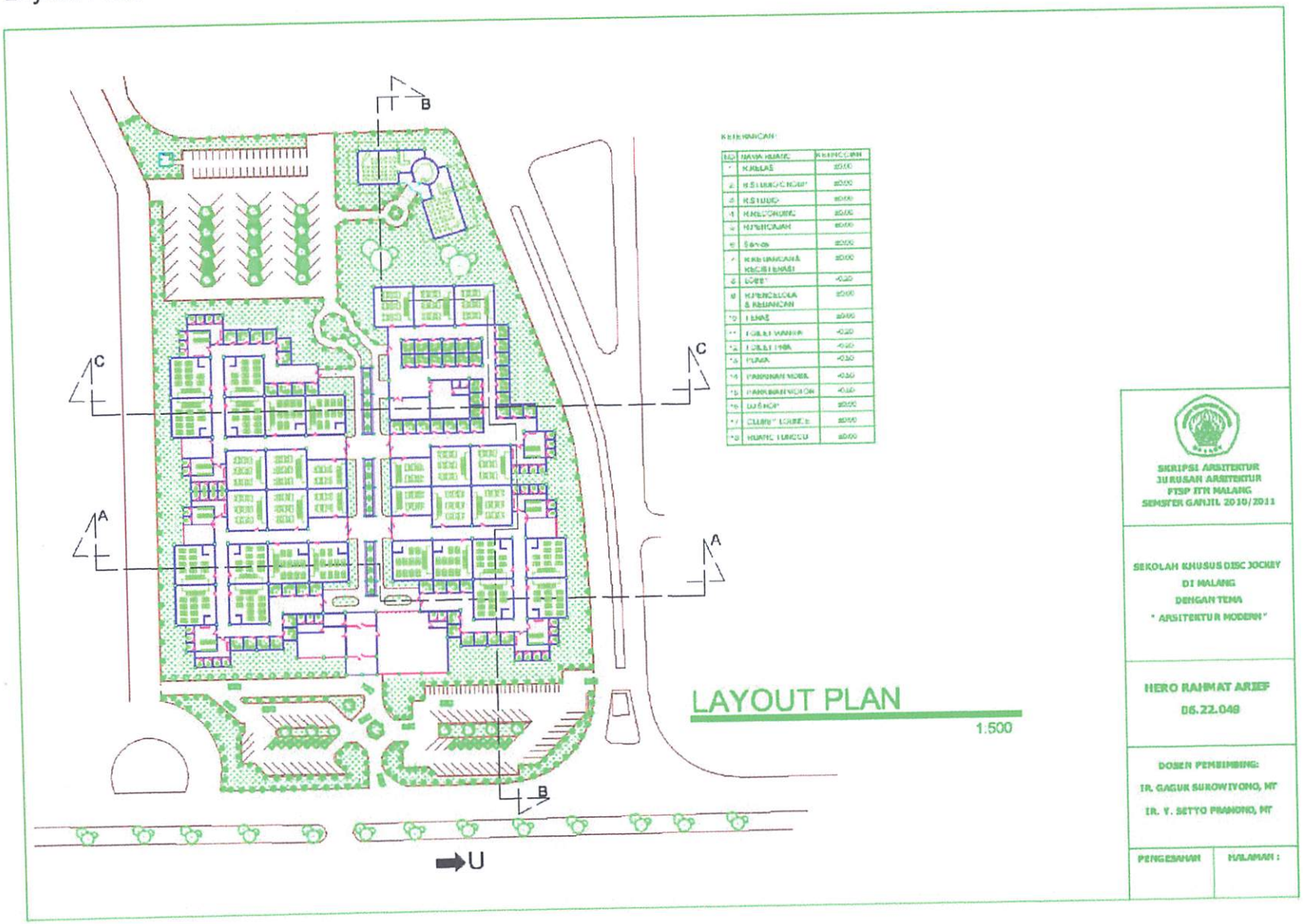
www.Google.com

7.7 LAMPIRAN

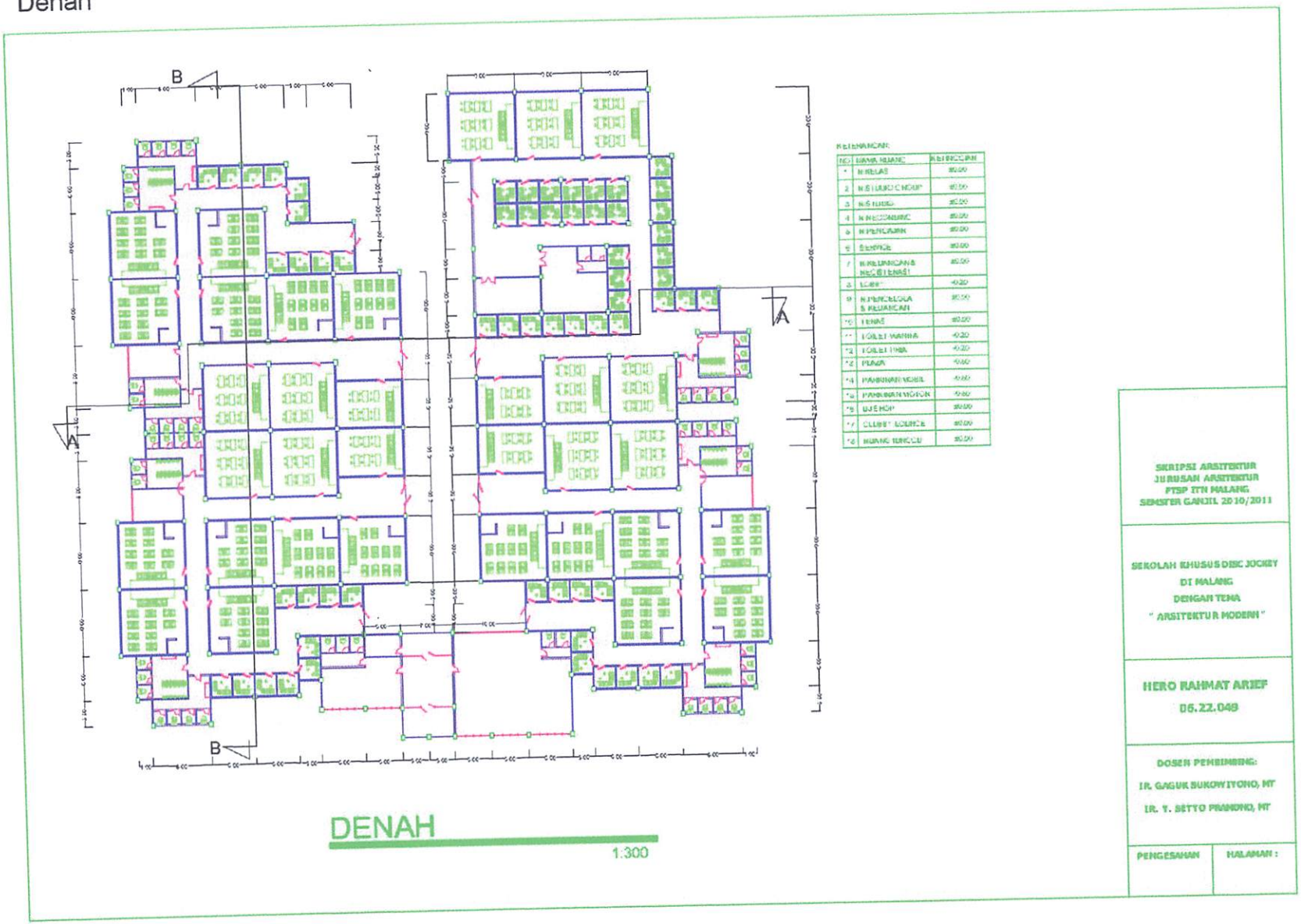
7.7.1 Site Plan



7.7.2 Layout Plan



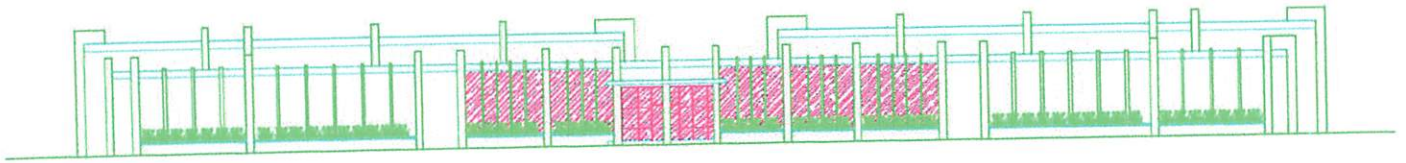
7.7.3 Denah



DENAH

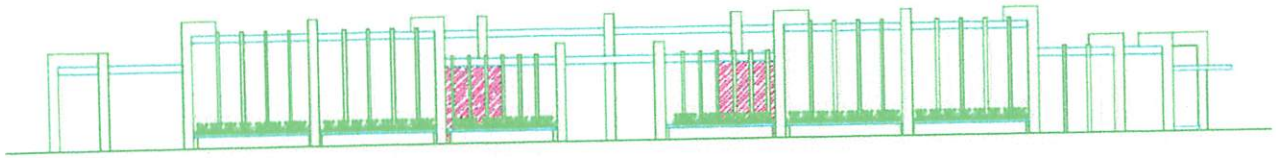
1:300

7.7.4 Tampak Bangunan



TAMPAK DEPAN

1:200



TAMPAK SAMPING KIRI

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05.22.049

DOSEN PEMBIMBING:
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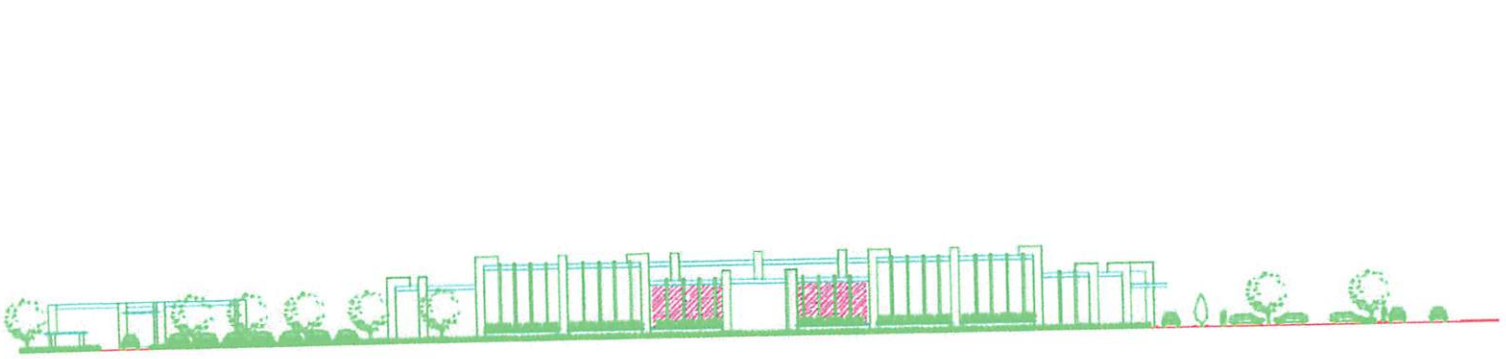
IR. Y. SETYO PRAMONO, MT

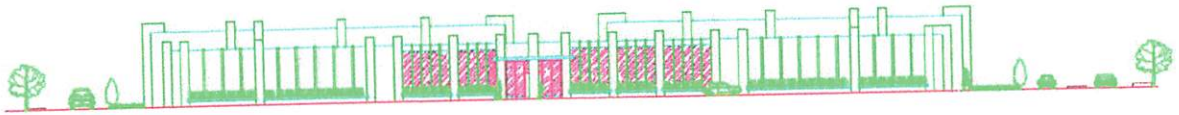
PENGESAHAN | HALAMAN :

7.7.5 Tampak Site



TAMPAK SAMPING SITE

1:500



TAMPAK DEPAN SITE

1:500

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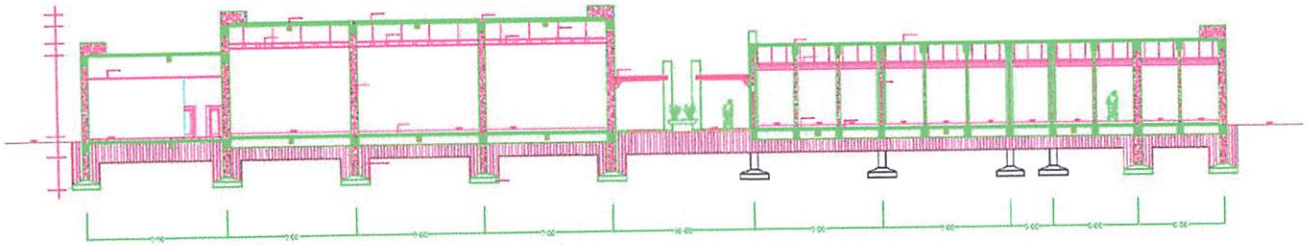
IR. Y. SETYO PRANOWO, MT

PENGESAHAN

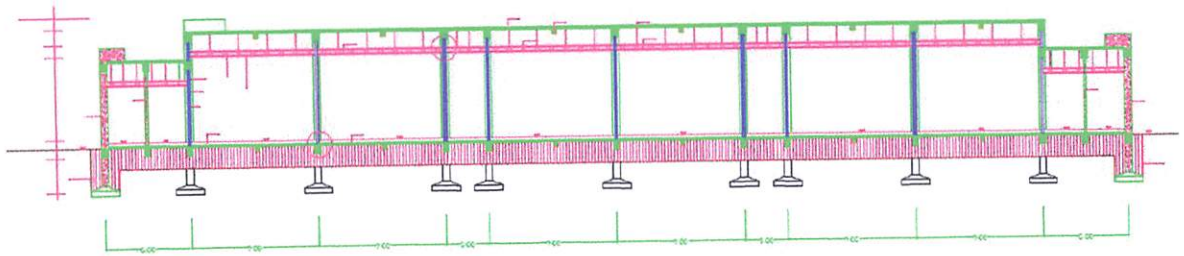
HALAMAN :
2

7.7.6 Potongan Bangunan



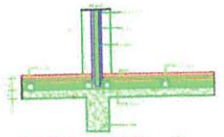
POTONGAN A - A

1:200



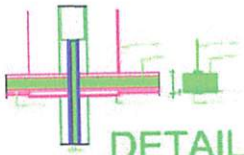
POTONGAN B - B

1:200



DETAIL A

1:50



DETAIL B

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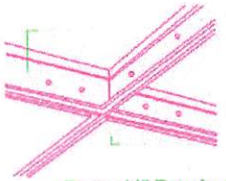
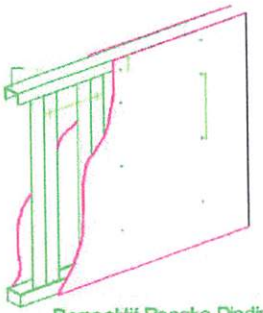


Perspektif Rangka Plafond



Perspektif Rangka Dinding

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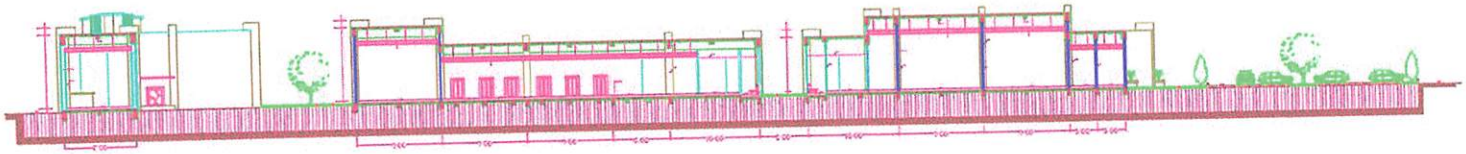
IR. Y. SETYO PRAMONO, MT

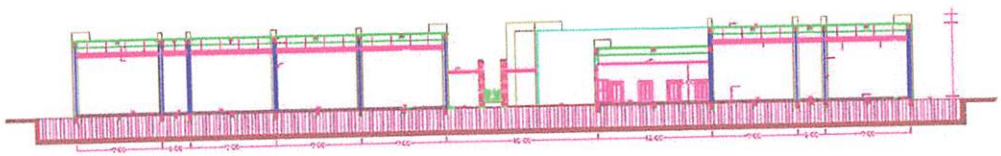
PENGESAHAN | HALAMAN :

7.7.7 Potongan Site



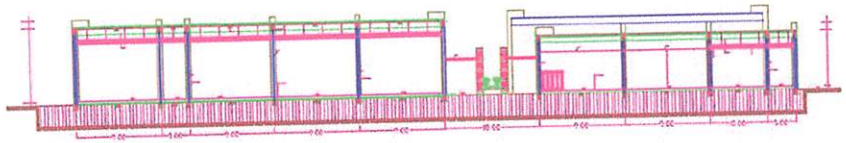
POTONGAN SITE B-B

1:300



POTONGAN SITE A-A

1:300



POTONGAN SITE C-C

1:300

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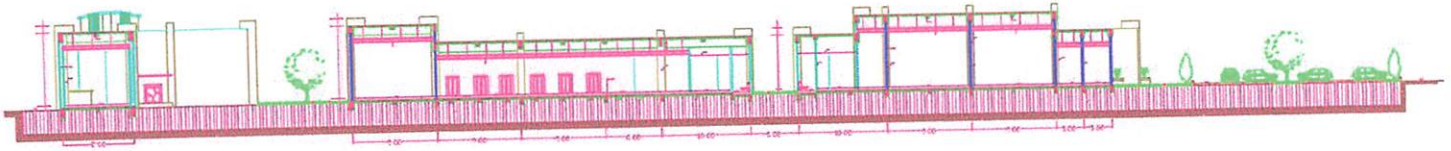
IR. Y. SETYO PRAMONO, MT

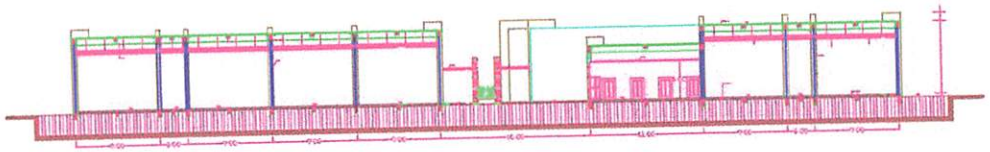
PENGESAHAN | HALAMAN :

7.7.8 Rencana Atap dan Pembalokan



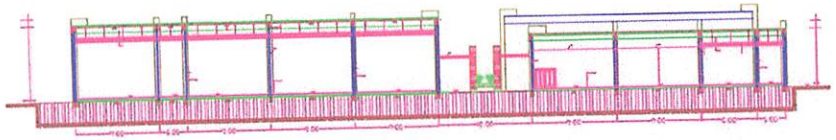
POTONGAN SITE B-B

1:300



POTONGAN SITE A-A

1:300



POTONGAN SITE C-C

1:300

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PENGESAHAN | HALAMAN :

7.7.9 Rencana Pondasi

RENCANA PONDASI & SLOOF

1.300

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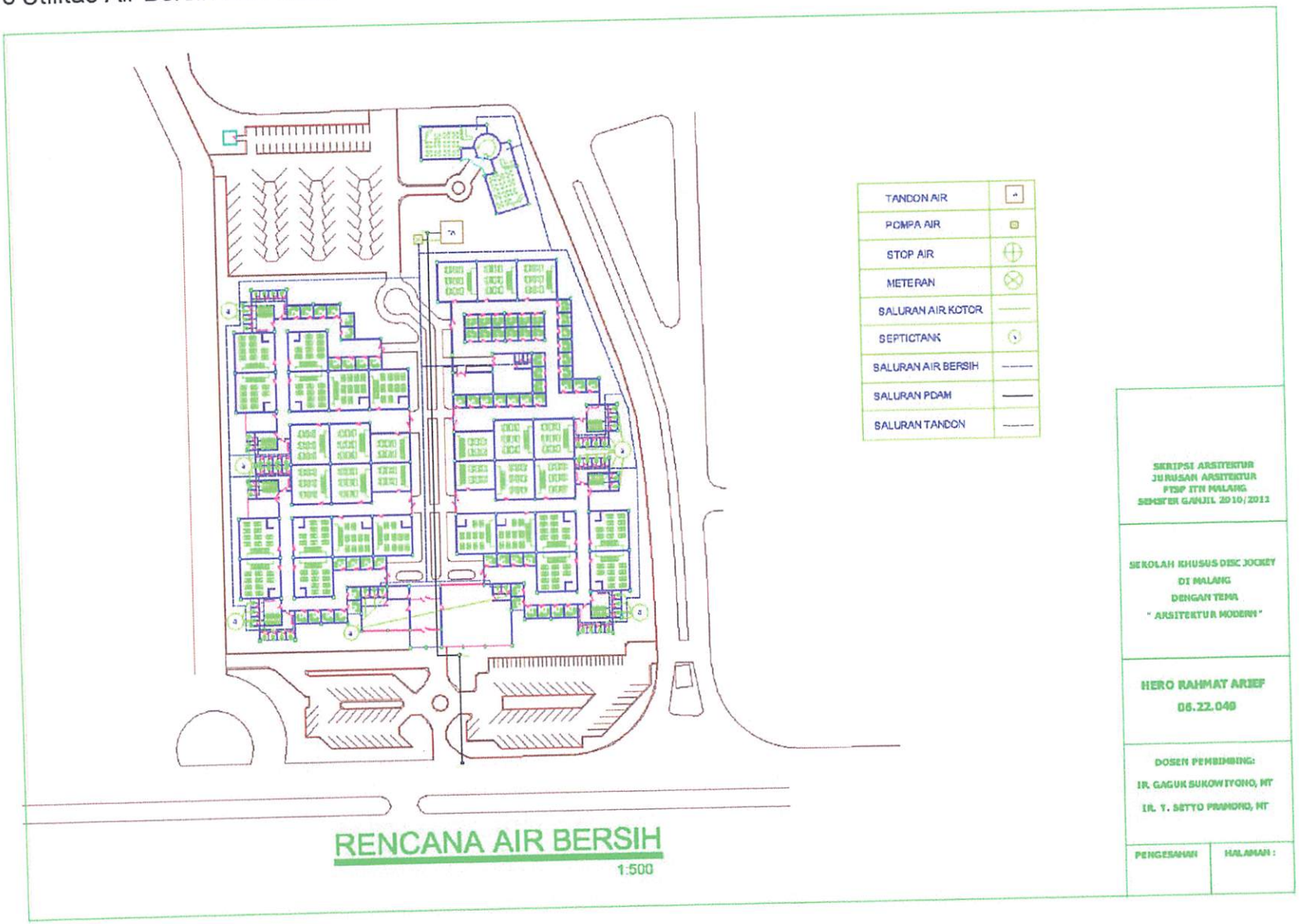
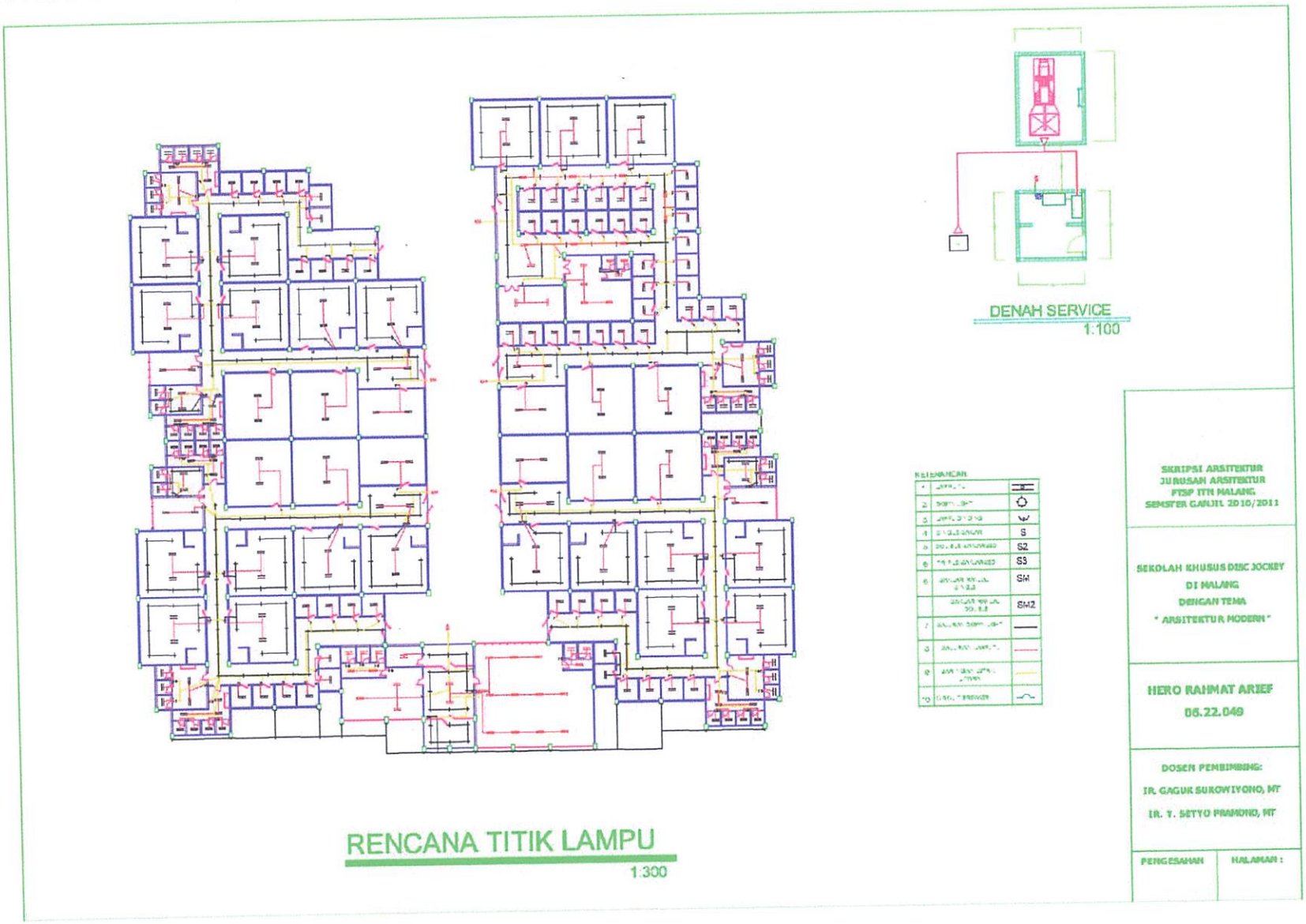
PENGESAHAN | HALAMAN :

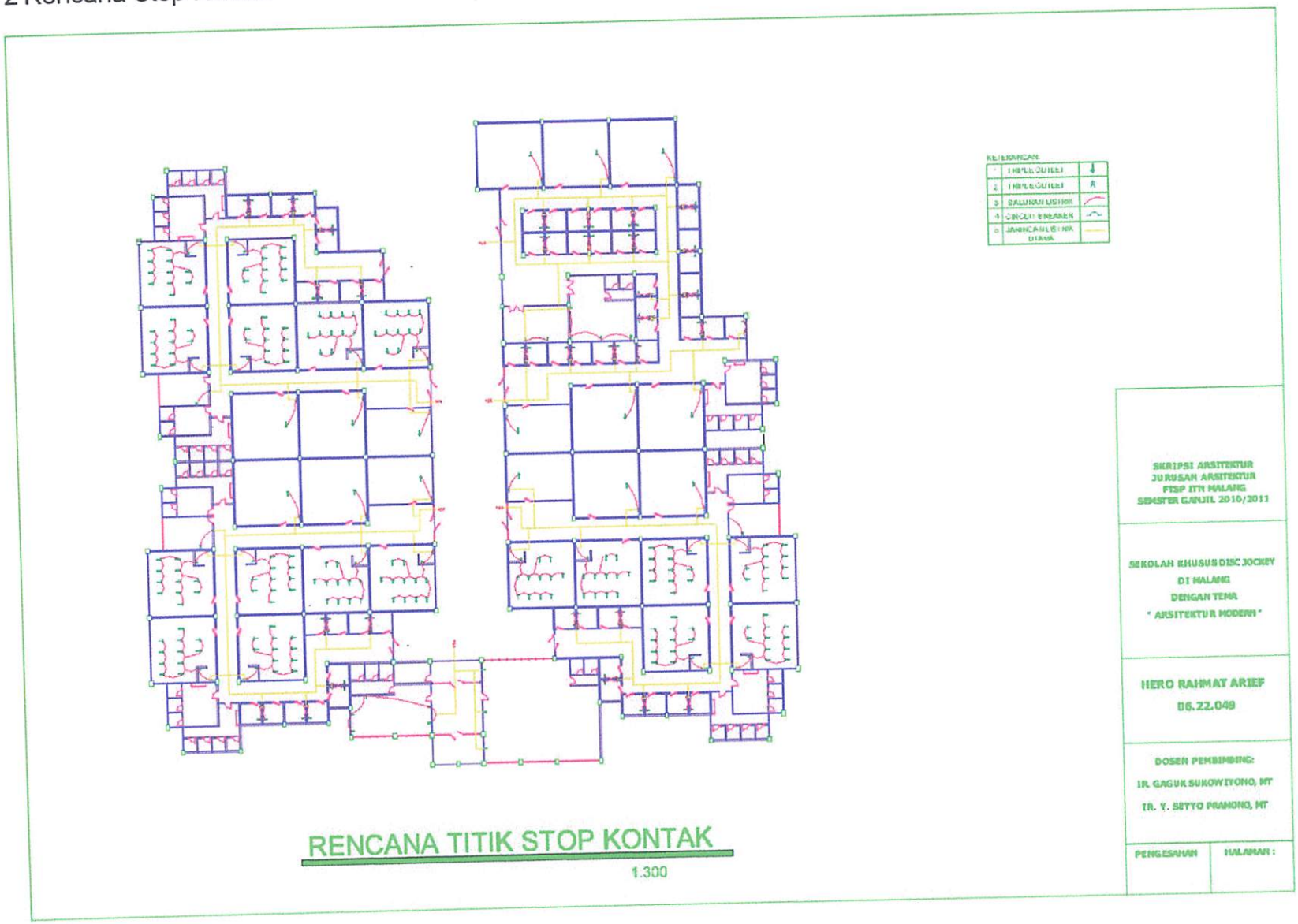
7.7.10 Utilitas Air Bersih Dan Kotor



7.7.11 Rencana Titik Lampu



7.7.12 Rencana Stop Kontak



RENCANA TITIK STOP KONTAK

1.300

7.7.13 Perencanaan AC