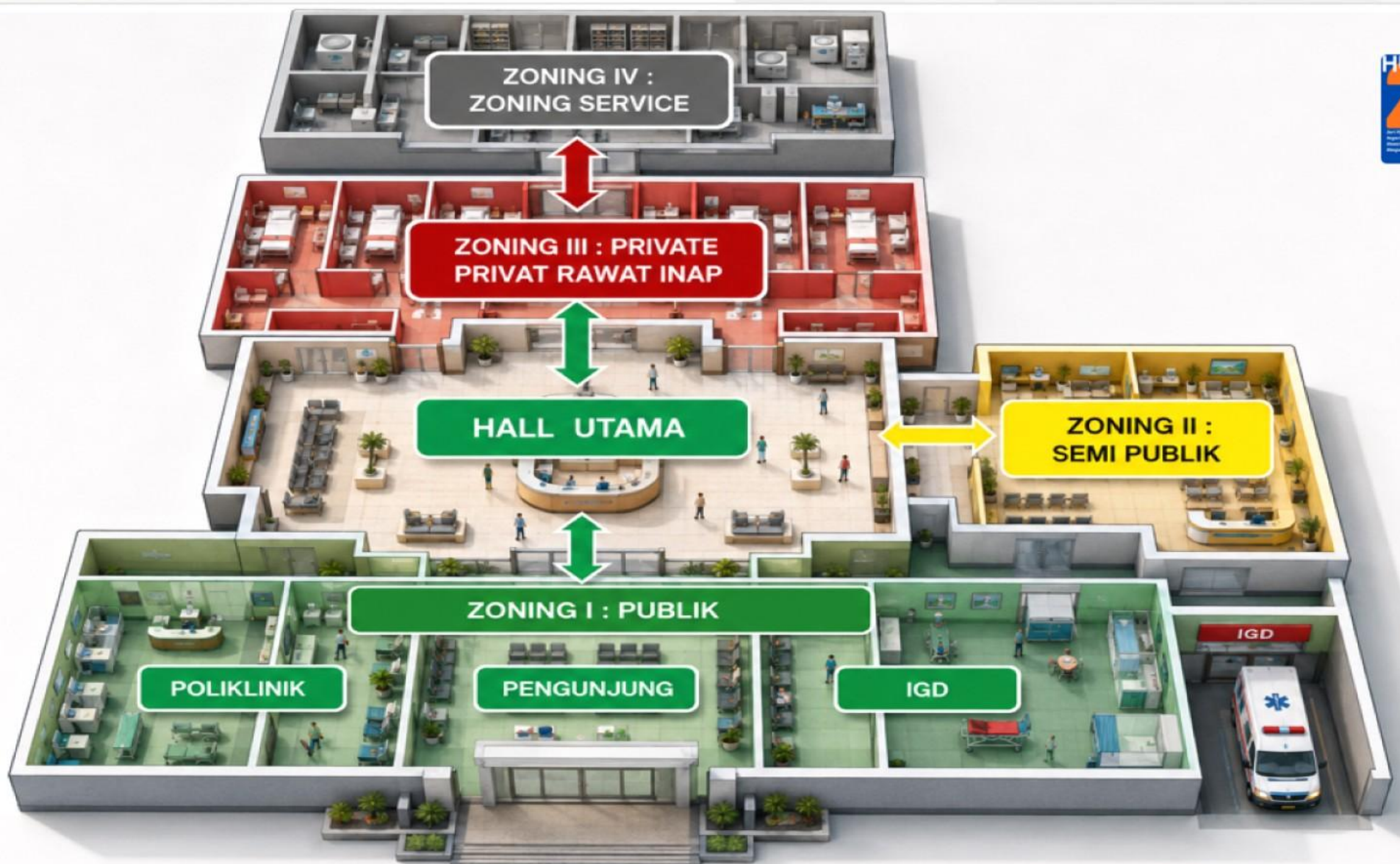




Tata Ruang Operasi

dr Ridha Wahyutomo, M.Arch, SpMK, CHRA, FISQua



ZONING PUBLIK

1. Hal Utama
2. IGD / Emergency Unit
3. Poliklinik Umum
4. Poliklinik Spesialis
5. Poli Klinik Eksekutif
6. Apotik
7. Medical Check UP

ZONING PRIVATE

1. Rawat Inap
2. ICU / ICCU / ICVCU / PICU / NICU
3. Instalasi Bedah Sentral
4. Cathlab / Hybrid OR
5. VK (Kamar Bersalin)
6. Perinatologi
7. Isolasi

ZONING SERVIS

1. Kitchen / Gizi
2. Laundry
3. CSSD
4. Gas Medis
5. IPAL - Incinerator
6. Kamar Jenazah
7. Ambulan, Mobil Jenazah
8. Power House
9. IPS-RS
10. Elektro Medik
11. Bengkel Umum
12. Kantin
13. Business Area

ZONING SEMI PUBLIK

1. Laboratorium Klinik
2. Radiologi Imaging
 - a. X Ray polos / Fluoroscopy
 - b. CT Scan
 - c. MRI
 - d. PET CT
3. Radio Terapi
4. Hemodialisa
5. Rehab Medik
6. USG
 - a. USG Convensional
 - b. USG Color -4-D
 - c. Echo Cardiografi
 - d. TCCD
7. Endoscopy
8. Diagnostic lain: Treadmill, ECG, EEG, EMG, ENG, dll



ICU

Instalasi Bedah Sentral

CSSD

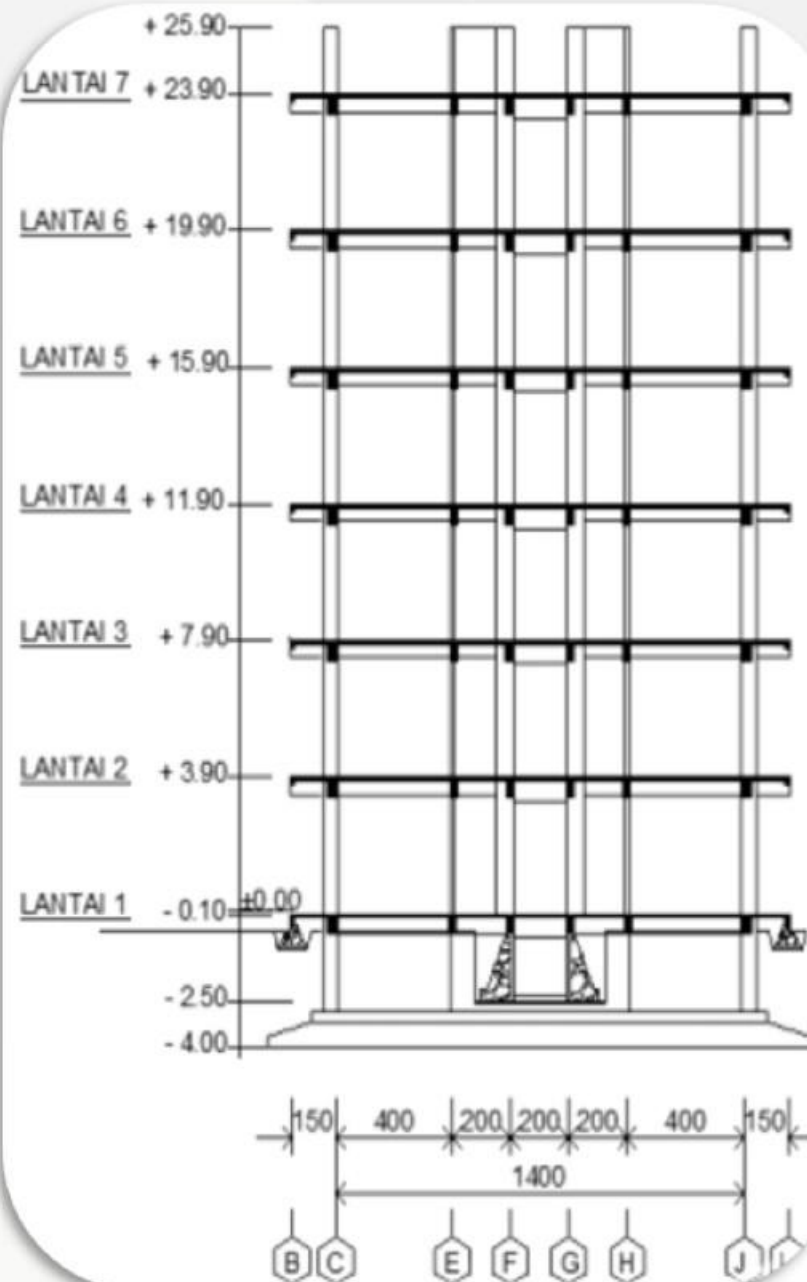
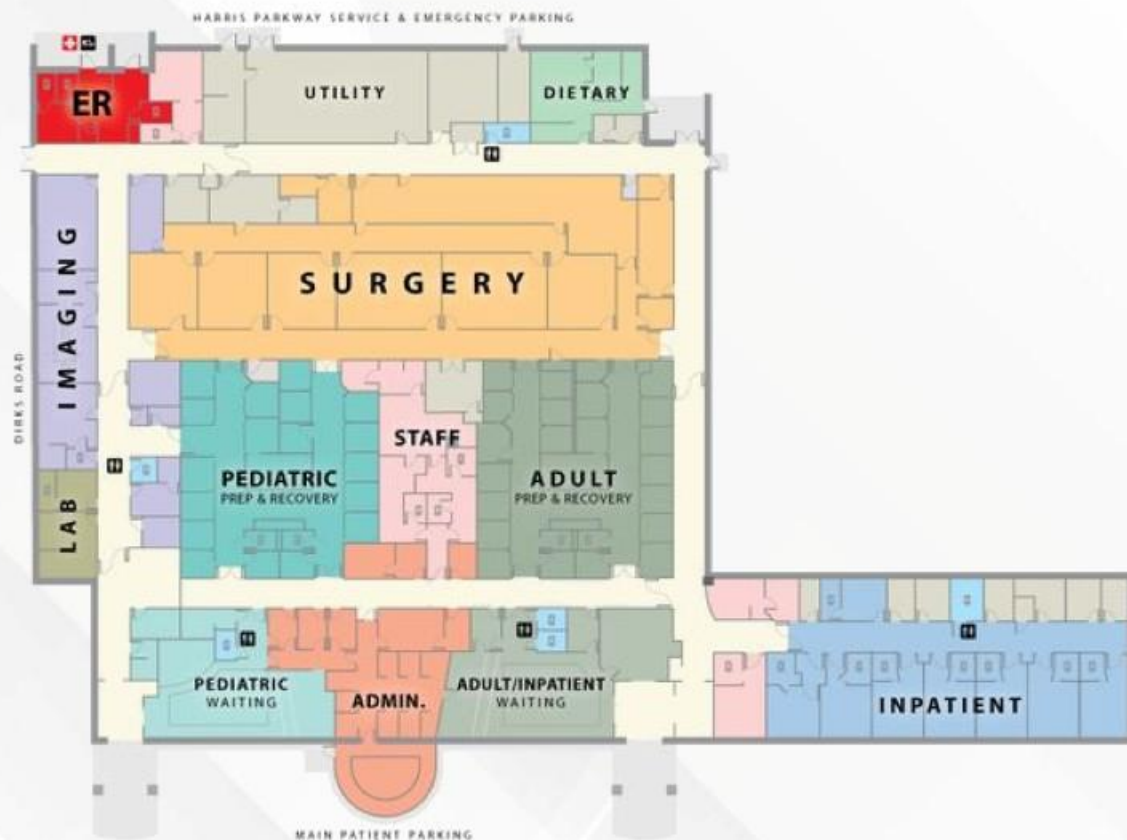
 RS Az Zubayr Ibdurrahman Syafakallah

CSSD
Central Sterile
Supply Department

 RS Az Zubayr
Ibdurrahman Syafakallah



Lokasi IBS



PRINSIP DESAIN INSTALASI BEDAH SENTRAL (IBS)

12 PRINSIP UTAMA DESAIN IBS MODERN, AMAN, EFISIEN DAN BERKELANJUTAN

- 1 Lokasi di Zona Privat



- 2 Mudah di capai dari IGD/ Cathlab/ ICU/ VK



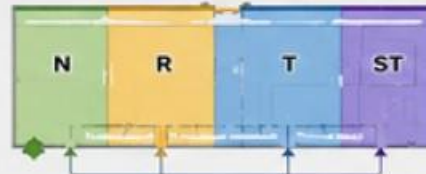
- 3 Berada di lantai tertinggi gedung RS Bertingkat



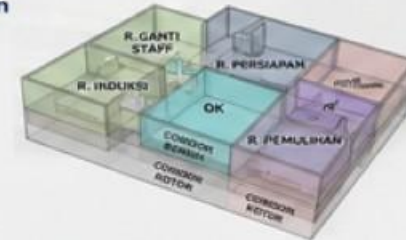
- 4 OK: Minor, Mayor, Khusus



- 5 Zona aseptik: N, R, T, ST



- 6 Kompartemen terpisah



- 9 Ventilasi: tersaring, terkontrol

Parameter: T, RH, ISO, ACH, P(a), LAF



- 10 Ventilasi terpisah OK-OK



- 11 Alur bersih kotor tidak crossing



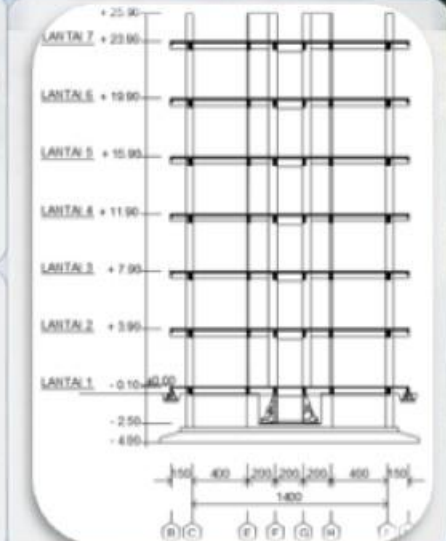
- 12 Atap IBS: Konstruksi beton



- 7 Di atas IBS bebas area basah



- 8 Jarak F-F: min. 4,70 m



AMAN



ASEPTIK



EFISIEN



RAMAH LINGKUNGAN

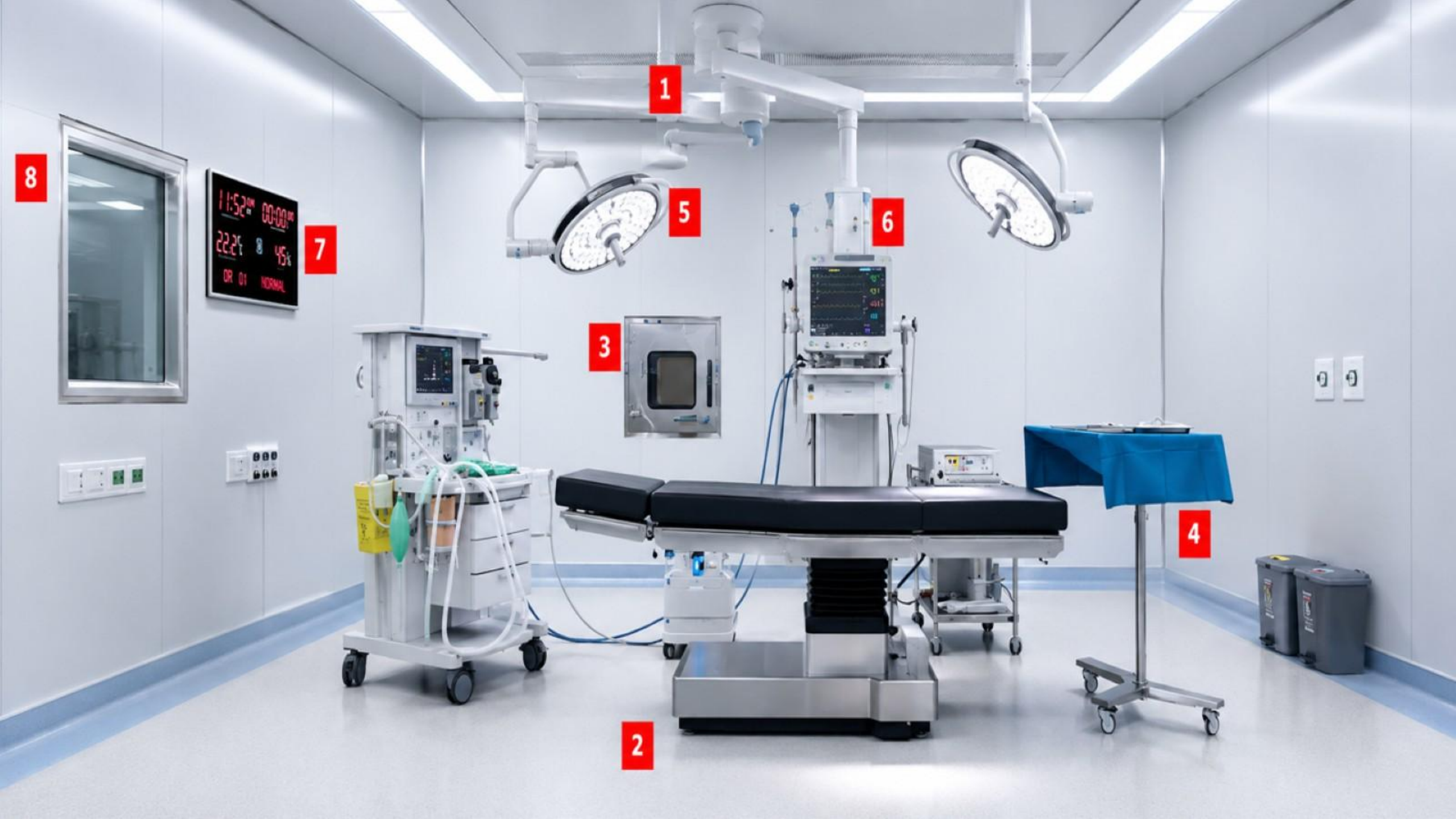


BERKELANJUTAN



- 1** ZONA TINGKAT RISIKO RENDAH (NORMAL) 
- 2** ZONA TINGKAT RISIKO SEDANG (NORMAL DENGAN PRE FILTER) 
- 3** ZONA TINGKAT RISIKO TINGGI (SEMI STERIL DENGAN MEDIUM FILTER) 
- 4** ZONA TINGKAT RISIKO SANGAT TINGGI (SEMI STERIL DENGAN PRE FILTER, MEDIUM FILTER, HEPA FILTER, TEKanan POSITIF) 
- 5** MEJA OPERASI (AREA NUKLEI STERIL) 





1

8

7

5

6

3

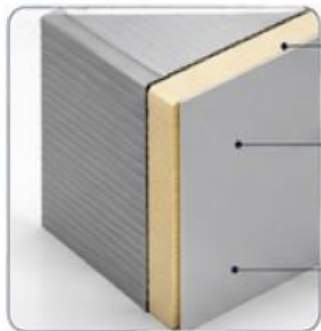
4

2

EPS (EXPANDABLE POLYSTYRENE) / PIR (POLY-ISOCYANURATE)



DETAIL DINDING (PANEL SANDWICH)



LAPISAN LUAR
Plat baja berlapis (color coated)

INTI INSULASI
EPS (Expandable Polystyrene)
atau PIR (Poly-Isocyanurate)

LAPISAN DALAM
Finishing higienis (PVC/PPGI)



Panel sandwich berinsulasi



Ringan dan cepat dipasang



Permukaan halus dan higienis

STAINLESS STEEL



DETAIL DINDING (STAINLESS STEEL)



PANEL STAINLESS STEEL
Plat stainless steel tebal 0,8 – 1,2 mm
finishing satin/brush

SISTEM SAMBUNGAN
Sambungan presisi
dengan sealant higienis



Permukaan seamless



Tahan korosi dan
mudah dibersihkan



Cocok untuk area
steril intensif



Mendukung kontrol infeksi



Tahan lembap & perubahan suhu



Memenuhi standar fasilitas kesehatan



Desain modern, fungsional, dan tahan lama

TIME

12:03 PM

Tuesday, 30/05/23

ANESTESI TIME

00 : 00 : 00

Start

Reset

SURGERY TIME

00 : 00 : 00

Start

Reset

MAIN MENU



History



Flow Diagram



Lighting

No Alarm

MODE

Standby Selected

System is On

ROOM TEMPERATURE



25.3 °C

Set Point: 21.00 °C

Recommended: 18 - 22 °C

ROOM PRESSURE

25 Pa

Set Point: 15 Pa

Recommended: > 10 Pa

HEPA FILTER



204.6 Pa

Clean

ROOM HUMIDITY



46.4 %

Set Point: 50.00 %

Recommended: 45 - 55%

FRESH AIR

20.49 %

Set Point: 20.00 %

Recommended: > 20%

AIR CHANGE

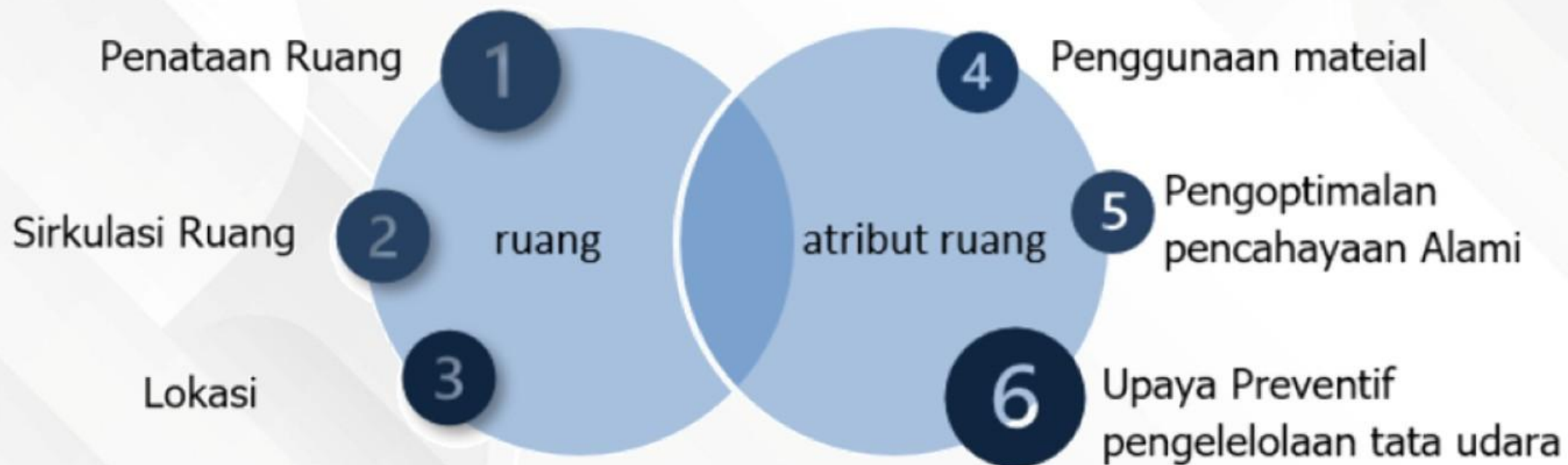
25.66 X

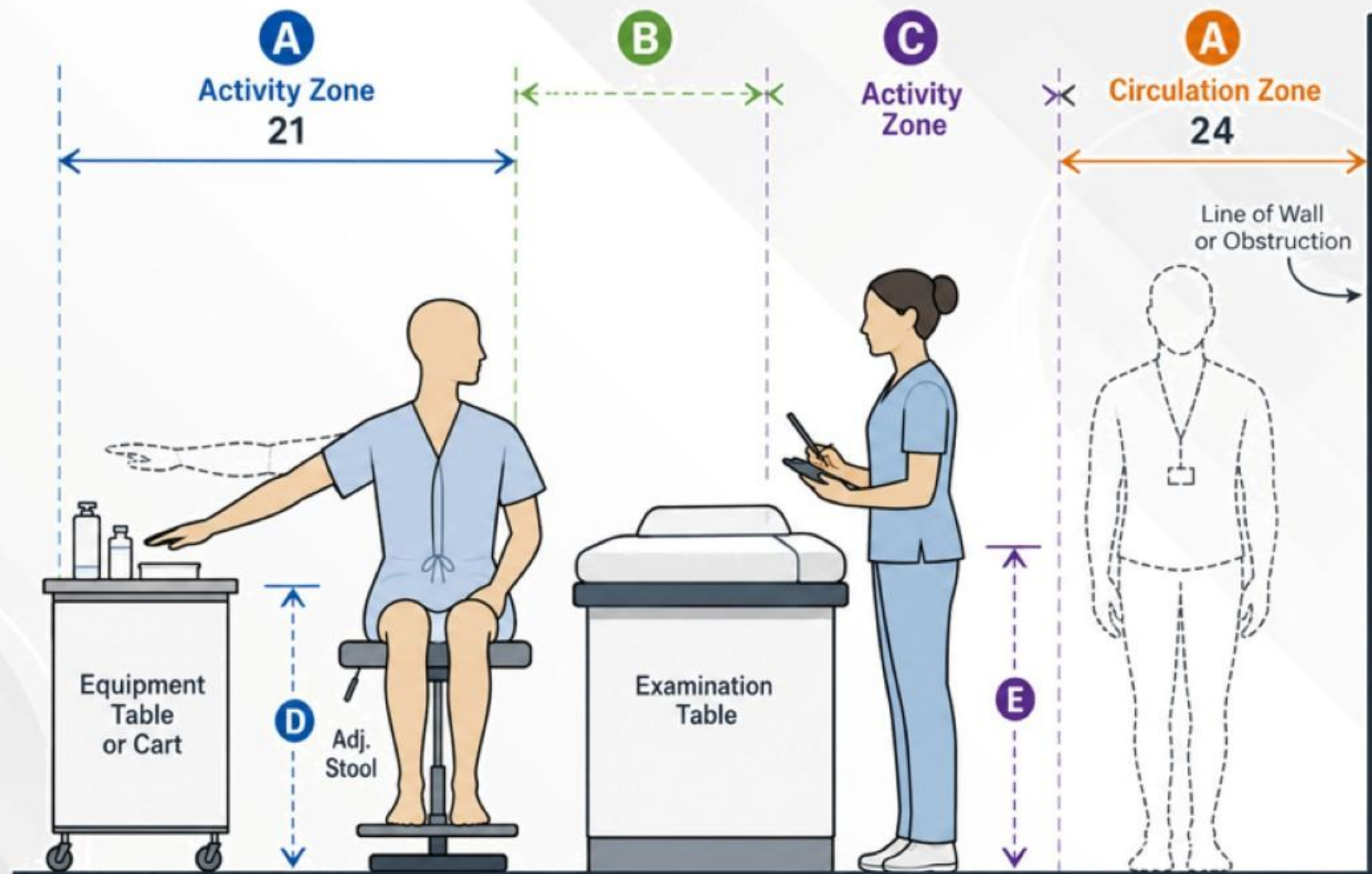
Set Point: 25.00 X

Recommended: > 25 X

Koridor dan Scrub Station







EXAM AREA / REACH AND CLEARANCE

A Activity Zone
21"

B Clearance Between
Zones

C Activity Zone
(Clinician)

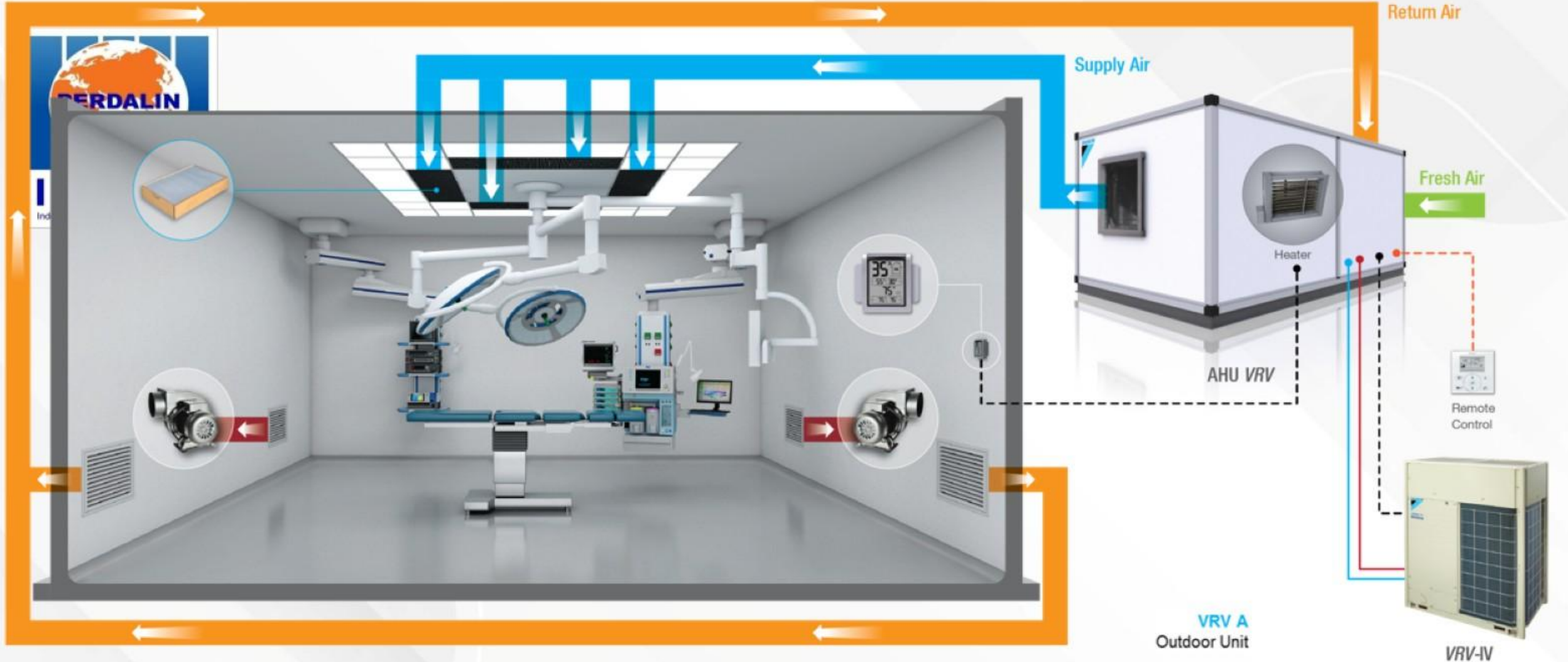
A Circulation Zone
24"

D Adj. Stool
Clearance

E Exam Table
Edge Clearance

Dimensions shown in inches





KETERANGAN			
EA Exhaust Air	SA Supply Air	--- Control Wiring	
RA Return Air	FA Fresh Air	— Gas line	
		— Liquid line	
		- - - Remote Control Wiring	

Parameter	Class 1.000
Air Movement	Laminar
Return Grill	Floor Level
Air Velocity	0,12 to 0,18 m/s
ACH (Air Change per Hour)	38 to 53

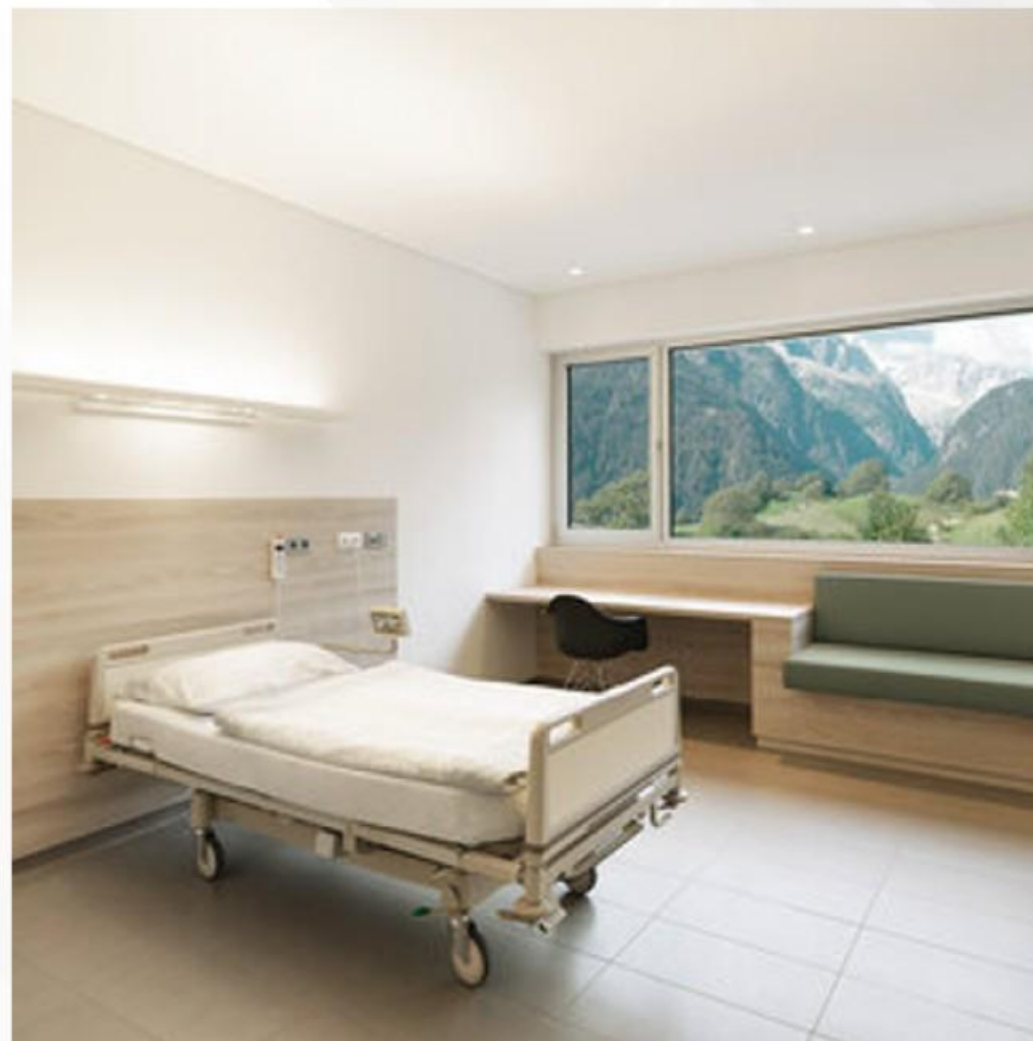
Performance								Application		
ANSI/ASHRAE Standard 52.2				ASHRAE Standard 52.1		IEST-RP-C001.3		Controlled particulate		
	Average minimum composite efficiency									
MERV	E ₁ (0.3 μm to 1.0 μm)	E ₂ (1.0 μm to 3.0 μm)	E ₃ (3.0 μm to 10.0 μm)	Average arrestance	Average dust-spot efficiency	Type	Removal efficiency at particle size	Size	Examples	Typical application
6	–	–	35 to 50%	85 to 90%	< 20%	–	–	3.0 to 10.0 μm	■ Mold and spores ■ Cement dust ■ Hair spray ■ Powdered milk	Standard commercial buildings, industrial workplaces, paint-booth inlet air
7	–	–	50 to 70%	> 90%	25 to 30%	–	–			
8	–	–	> 70%	> 90%	30 to 35%	–	–			
9	–	< 50%	> 85%	> 90%	40 to 45%	–	–	1.0 to 3.0 μm	■ Legionella ■ Lead dust ■ Coal dust ■ Auto emissions	Better commercial buildings, hospital laboratories
10	–	50 to 65%	> 85%	> 95%	50 to 55%	–	–			
11	–	65 to 80%	> 85%	> 95%	60 to 65%	–	–			
12	–	> 80%	> 90%	> 95%	70 to 75%	–	–			
13	< 75%	> 90%	> 90%	> 98%	80 to 90%	–	–	0.3 to 1.0 μm	■ Bacteria ■ Most tobacco smoke ■ Cooking oil ■ Droplet nuclei (sneezes)	Superior commercial, general surgery, smoking lounges, hospital inpatient care
14	75 to 85%	> 90%	> 90%	–	90 to 95%	–	–			
15	85 to 95%	> 90%	> 90%	–	> 95%	–	–			
16	> 95%	> 95%	> 95%	–	–	–	–			
17	–	–	–	–	–	A	99.97% at 0.3 μm	< 0.3 μm	■ Virus (unattached) ■ Sea salt ■ Radon progeny ■ Carbon dust	Cleanrooms, pharmaceutical manufacturing, radioactive materials, carcinogenic materials
18	–	–	–	–	–	C	99.99% at 0.3 μm			
19	–	–	–	–	–	D	99.999% at 0.3 μm			
20	–	–	–	–	–	F	99.999% 0.1 to 0.2 μm			

MERV = Minimum Efficiency Reporting Value

AREA	ISO 14644-1 RATING (28) IN OPERATION	MAXIMUM NUMBER OF PARTICLES @0.5 MM
Patient wards	ISO 9	35,200,000
Operating room	ISO 8	3,520,000
High-risk operating room	ISO 6	35,200
Conventional operating room	ISO 8	3,520,000
Intensive care unit	ISO 8	3,520,000
Infectious isolation room	ISO 8	3,520,000
Protective isolation room	ISO 8	3,520,000
Laboratory	ISO 9	35,200,000
Emergency room-trauma/resuscitation room	ISO 8	3,520,000
Labor/delivery/recovery	ISO 8	3,520,000
Dialysis treatment area	ISO 9	35,200,000
Autopsy room	ISO 9	35,200,000
Burn unit	ISO 8	3,520,000
General examination room	ISO 9	35,200,000
Laundry	ISO 9	35,200,000

PARAMETER/CONTAMINANT	GUIDANCE LIMIT	REFERENCE	RECOMMENDED MEASUREMENT TECHNIQUE	SUGGESTED MEASUREMENT TIME	COMMENTS
Fungal structures (air) very clean areas	Absent				
Fungal structures (air) moderately clean areas	< 10 cfu/m ³ ^d	UNE 171330-2 (21)	NIOSH 0800	3—5 minutes	Other equivalent laboratory methods are acceptable.
Fungal structures (air) other areas	< 25 cfu/m ³				
Bacteria ^e very clean areas	< 10 cfu/m ³				
Bacteria moderately clean areas	10—100 cfu/m ³	UNE 171330-2 (21)	NIOSH 0800	3—5 minutes	Other equivalent laboratory methods are acceptable.
Bacteria other areas	100—200 cfu/m ³				

General, Task, Accent Lighting



•**50 lux:**

- Sangat redup, cocok untuk ruang tidur atau area relaksasi yang membutuhkan suasana tenang dan minim stimulasi.

•**100 lux:**

- Masih tergolong redup, cocok untuk area tunggu atau ruang baca yang membutuhkan pencahayaan lembut.

•**200 lux:**

- Cukup terang untuk aktivitas ringan, seperti membaca atau bekerja di komputer dalam waktu singkat.

•**250 lux:**

- Sesuai dengan standar untuk ruang rawat inap di rumah sakit, memberikan pencahayaan yang cukup untuk aktivitas sehari-hari namun tetap nyaman.

•**300-500 lux:**

- Ideal untuk ruang kerja, ruang kelas, atau area publik yang membutuhkan pencahayaan yang cukup untuk berbagai aktivitas visual.

•**1000 lux:**

- Sangat terang, cocok untuk area yang membutuhkan detail visual yang tinggi, seperti ruang bedah atau laboratorium.

Diskusi