Starting an Eye Hospital with Minimum Real estate

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Kumaran Eye Speciality Center
Chennai
Mandatory Requirements

- Building plan approval
- Mandatory Licenses
- Minimum area required ??
- Scope of services
- Set back Area
Principles to be taken into consideration while planning an Eye Care set up (physical / architecture)

- Location, No:of patients seen
- Zone wise distribution
- Space allocation/ Instrumentation
- Ventilation & temperature control- HVAC
- Differently Abled friendly
- Emergency /Fire exit
- Rest Rooms
Principles to be taken into consideration while planning (physical / architecture)

- Multidisciplinary approach
- Whom to get involved?
Whom to get involved?

- Anaesthetist
- Architect / Structural Engineers / Interior Designers
- HVAC engineers
- Electrical Engineers (Raw power/ Emergency power supply)
- Biomedical engineers
- Paramedical Staff
- Fire Safety Personals
- Bio-Medical waste disposal management
- Yourself
Evolution of Modern- eye hospital

- **Engineering Approach** - Technology centred & puts people to fit it

- **Ergonomic Approach** - Puts people first and fits technology around them.
Approach to Planning

Engineering design-
Technology Centered

Ergonomic design-
People Centered
How are we planning to put in a table to suit both the doctor and the patient?
Approach to Planning
Finally..
Points to be considered while planning an Eye Care set up

- Present and future needs
- Volume of Patients-OPD & Surgical Volume
- Rest rooms
- Plumbing/Water needs of Staff/Patients
- Zoning in the Hospital
- Parking /Security
- Electrical- Raw/Backup power /Fluctuations/Medical instruments
Hospital Zoning

- Parking
- Out-Patient Area
- Surgical Area
- Inpatient Area
- Investigative areas
- Staff Rest area
- Laundry
Key Areas in an Eye Hospital

- Optical Area Display
- Pharmacy
- Out-Patient Area / Doctor chambers

- Operation Room
- Recovery Room
- In-Patient Room
- Counselling Room
Out-Patient Area

- Front desk
- Reception
- Consultation rooms
- Optometry Cubicles
- Emergency Room
- Nurse station
- Patient education display
Optical Area Display

- Maximum display
- At the entrance to attract customers
- Cater to all clients
KESC- Investigation Arena

- Single speciality/Comprehensive investigations
- Cluster approach for instruments
- Power back up
Operating room
Civil-Standard Requirements

- Minimum 260 sq ft of main OT area
- Height of OT: 9-10 feet
- Seamless surface
- Adequate Separate entry/exit for sterile and unsterile things

- Hermetically sealed doors
- Lighting
Zones in an OT complex

- Protective Zone
- Clean Zone
- Aseptic Zone
- Disposal Zone
- Other areas
Zones in an OT complex

- Protective Zone
- Clean Zone
- Aseptic Zone
- Disposal Zone
- Other areas
Protective Zone

- Change rooms
- Transfer bay - patients & equipments
- Rooms for staff
- Stores & records
- Pre & post-operative rooms
- Recovery beds
- Sterile stores
Clean Zone

- Connects protective zone to aseptic zone and has other areas also like:
  - Stores & cleaner room
  - Equipment store room
  - Maintenance workshop
  - Firefighting device room
  - Emergency exits
  - Service room for staff
Aseptic Zone

• Operation theatre
Disposal Area

- Disposal areas from each OR & corridor lead to disposal zone.
Other Areas to be considered in OT setup

- Pre-operative check in area (Reception)
- Holding area/Induction Area
- Post anesthetic care units /Recovery Rooms
- Staff room & Sanitary facility
- Manifold room
- Store room
- Theatre sterile supply unit (TSSU)
Theatre sterile supply unit (TSSU)
Theatre sterile supply unit (TSSU)
Autoclave
Principle points:

Non-medical

Medical
Principle points

Non-medical

- **Civil** - Ceiling, Walls, Floor, Joints & Doors
- **Ventilation** - LAF, AHU, Temperature, Humidity, Air changes & Pressure control
- **Biomedical Waste disposal /Water treatment plant**
- **Electrical, General lighting & Plumbing**
- **Scrub room & Sink**
- **Change Rooms/ Conveniences**
- **Emergency Measures**
Main Operating Room-Principle points-Non-Medical

CIVIL
CIVIL

Granite for walls/floor

Granite for walls/floor
Walls with PUF paint

SS duct embedded in walls
CIVIL

Coving with SS

Coving with granite
CIVIL

Double Leaf Hermetically sealed

Single Leaf Hermetically sealed
Main Operating Room-Principle points-Non-Medical-Ventilation
Ventilation - Standards

- Temperature: 21-23 degree C
- Humidity: 40-60%
- Positive pressure: 2.5 pascals
- Air Velocity: 25-35 fpm
- Air changes: 20/hr, 20% should be fresh air.

- Air quality: ISO class 6/class 1000
- Terminal HEPA filter should extend 1 feet around the operation site
Ventilation – flow chart
Ventilation - Components

Air Handling Unit (AHU)
Supply duct: Conditioned & purified air
Return air duct

AC Compressor

Laminar Air flow (LAF)
LAF Plenum
Air Handling Unit (AHU)

- 3 micron filter
- Kruger Air Blower
- Condensing Coils
- Fresh air inlet
- 10 micron filter
Principal Points

Water quality
## ISO WATER QUALITY STANDARDS

**Sample No:** AEL/2016/3494  
**Mix:** SNOW WHITE (P) LTD  
**Date:** 01.02.16

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<tr>
<th>S.No</th>
<th>Parameter</th>
<th>Requirement as per IS 10500-2012</th>
<th>Permissible Limit in absence of alternate source</th>
<th>Results</th>
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<td>1</td>
<td>Calcium (TCU)</td>
<td>5</td>
<td>&lt; 5</td>
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<td>2</td>
<td>Odour</td>
<td>Agreeable</td>
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<td>Conductivity</td>
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<td>600 mg/l</td>
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<td>8</td>
<td>Carbonate Hardness (as CaCO3)</td>
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<td>Non Carbonate Hardness (as CaCO3)</td>
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<td>Silica (as SiO2)</td>
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</table>

*Sample collected by Asian Enviro Labs  
*The results shown in the report are valid only to the sample and should not be reproduced in any case unless with a written approval from the company.

**ANALYZED BY:**

[Signature]
RO WaterPlant
Water Quality

WATER QUALITY AT SOURCE

WATER QUALITY AFTER RO
Water: Scrub Room

Terminal UV filter
BMW- Water treatment

1. BMW Water treatment chamber + NaClO
2. Control Valve
3. Intermediate chamber
4. Main chamber
5. To Sewer
Principle points-
Non-Medical
Electrical
Electrical

- General lighting
- Surgical Lighting
- Surgical Recording
- Lighting intensity

- Emergency power
- Electrical Load
- Electrical wiring
- Communication
IP (Ingress protection) Ratings for lights used in Operation theatres
Electrical: General Lighting

IP 64 grade OT lights
Electrical-Surgical Lighting
Electrical-Alternate power sources
Surgical Recording/Communication
Surgeon Panel
Surgical Recording/Communication: Surgeon Panel
Surgical Recording/Communication
Surgeon Panel
Electrical Load & Wiring

- Phaco machine+Vit+ Microscope
- Operating Table+Chair
- Boyles+NIBP
- Electrocautery
- Surgeon Panel instruments
- Green Laser
- Heat resistant+ Flame retardant wires
- Anti-rodent and anti-termite wires
- Proper casing for electrical conduit
Conveniences
Emergency - Fire
Manifold, Anesthetic Pendant

PENDANT

MANIFOLD

MEDICAL GAS
COMPRESSOR+FILTER

N₂  N₂O  O₂

Emergency N₂ cylinder
OT VALIDATION
OT VALIDATION

Differential Pressure Test

Test Report Reference: TACPL / FI / 05 E-1 / 03-16

Client: Kumaran Eye Speciality Centre

Site: M/s. Kumaran Eye Speciality Centre

Area / Equipment Under Test: Operation Theatre (Optha) to Corridor

Date of Testing: 30.05.2016

Tested by: Mr. Abdul Rehmat of M/s. True Aire Concepts Pvt. Ltd.

In the Presence Of: Mr. Subramanian of M/s. True Aire Concepts Pvt. Ltd.

Details of Equipment Used:

- Differential Manometer of “Wayne” make having Serial number 150021 calibrated on 23.01.2016.

- 23.01.2017: Amano Instruments.

Pressure in Pa:

- Operation Theatre (Optha) to Corridor: 10 Pa

Results of measurement at the three points:

- Location: Operation Theatre (Optha) to Corridor
  - Filter: 1
  - Upstream concentration: 0.005 mg/l
  - Downstream concentration: 0.000 mg/l
  - Leakage %: 0.000%
  - Test Result: Passed

- Location: Operation Theatre (Optha) to Corridor
  - Filter: 2
  - Upstream concentration: 0.005 mg/l
  - Downstream concentration: 0.000 mg/l
  - Leakage %: 0.000%
  - Test Result: Passed
OT VALIDATION
Finally

Thank you