Health Facility
Architectural Needs Statement

2021
Edition

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HEALTH FACILITY ARCHITECTURAL NEEDS STATEMENT

USER MANUAL

The users of this Health Facility Architectural Needs Statement are not allowed to modify the document other than the appendices' present sections. Any shortfall in this document should be brought to the Secretariat's attention for clarification and subsequent revision.

The users of this document are allowed to add an ‘addendum needs statement’ to cater to any special or specific requirements for the proper functioning of the intended space or other specific requirements that are not covered within this Health Facility Architectural Needs Statement. All appendices provided shall only be used as a guide, and they should be checked and tailored to meet the specific requirements of the intended project.

Secretariat
Kumpulan Khidmat Kepakaran Fasiliti Kesihatan
Bahagian Reka Bentuk Fasiliti Kesihatan 1
Cawangan Arkitek
Ibu Pejabat JKR Malaysia
October 2021

ABBREVIATIONS

ABS	Acrylonitrile Butadiene Styrene
AHU	Air Handling Unit
A&E	Accident and Emergency
BIM	Building Information Modelling
BPEP	BIM Project Execution Plan
BS	British Standards
CE	Check/Examine
C&S	Civil and Structure
CCC	Certificate of Completion & Compliance
CCU	Coronary Care Unit
CGSO	Chief Government Security Office Malaysia
CIDB	Construction Industry Development Board
CPC	Certificate of Practical Completion
CV	Curriculum Vitae
DAK	*Daftar Aset Khusus*
DEIA	Detailed Environmental Impact Assessment
DGFS	Director General of Fire Services, Malaysia
DOE	Department of Environment Malaysia
DOSH	Department of Occupational Safety and Health Malaysia
DLP	Defect Liability Period
DPA	*Daftar Premis Aset*
EG	Electro Galvanized
EIA	Environmental Impact Assessment
EN	European Standard
EMP	Environmental Management Plan
EMS	Environmental Management System
EPU	Economic Planning Unit or Jawatankuasa Standard Dan Kos, Unit Perancang Ekonomi
ESA	Environmentally Sensitive Areas
FFL	Finish Floor Level
FRP	Fire Rated Period
GI	Galvanized Iron
GMP	Good Manufacturing Practice
HDW	High Dependency Ward
HPL	High Pressure Laminated
IAEA	International Atomic Energy Agency
ICU	Intensive Care Unit
IBS	Industrialized Building System
IT	Information Technologies
JBPM	Jabatan Bomba dan Penyelamat Malaysia
JLN	Jabatan Lanskap Negara
JKR	Jabatan Kerja Raya
JPPN	Jawatankuasa Perancang Pembangunan Negara
KPKR	Ketua Pengarah Kerja Raya

KPKT	Kementerian Perumahan dan Kerajaan Tempatan
KPTG/PTG	Ketua Pengarah Tanah dan Galian
LAM	Lembaga Arkitek Malaysia
LAN	Local Area Network
LOI	Letter of Intent
LSG	Light Solar Gain
MDF	Medium Density Fiberboard
M&E	Mechanical and Electrical
MBOR	Medical Brief of Requirement
MOA	Memorandum of Agreement
MOF	Ministry of Finance
MOH	Ministry of Health
MS	Malaysian Standards
NC	Noise Level
NCR	Non-Conformance Report
NPP	Malaysian National Physical Plan
OT	Operation Theatre
PAC	Patient Assessment Centre
PeDATA	*Pengumpulan Data dan Pelabelan Aset Tak Alih*
pHJKR	*Penarafan Hijau* JKR
PD	Project Director
PSP	Principal Submitting Person
PP	Polypropylene
PU	Polyurethane
PUR	Polyurethane Reinforced
PIR	Polyisocyanurate
PVC	Polyvinyl Chloride
PwD	Persons with Disability *(OKU)*
RC	Reinforced Concrete
RDI	Room Data Interactions
RHS	Rectangular Hollow Section
RWDP	Rainwater Down Pipe
SDBA	Street, Drainage and Building Act
SKATA	Sistem Kod Aset Tak Alih
SOA	Schedule of Accommodation
SS	Stainless Steel
TCPA	Town, Country and Planning Act
TOR	Terms of Reference
TSA	Technical Specification Adherence
UBBL	Uniform Building by-Laws
uPVC	Unplasticized Polyvinyl Chloride
VIP	Very Important Person
VOC	Volatile Organic Compound
VVIP	Very Very Important Person
WC	Water Closet

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APPENDICES

SECTION 1.0: GENERAL

1.1 INTRODUCTION

1.1.1 The Architectural Works Brief as given shall be for the design, construction, completion, commissioning, handing-over, and maintenance of building works for the said project (Project name and location refer to **Appendix 1 – Project Brief**). Attachment of the proposed site plan/development boundary is indicative only.

1.1.2 The Architectural Works Brief shall be read in conjunction with the Civil and Structural Works Brief, Mechanical Works Brief, Electrical Works Brief, JKR Standard Specifications for Building Works, JKR Building Information Modelling (BIM) Requirements (if needed), Needs Statement for Total Assets Management and all other requirements, of which together shall form the Government Needs Statement for the project. All design and building work requirements specified in the needs statement shall be coordinated and integrated thoroughly to achieve an overall design proposal that is cohesive and harmonious.

1.1.3 All architectural requirements on the design, specification, construction, equipping, completion, and commissioning of the project shall be carried following with the best commercial and engineering practice and shall comply with the **latest** stipulated Government Circulars, Standards, Guidelines, Acts & Regulations and in compliance to other international accreditation body or standards.

1.1.4 The Conceptual Design Drawings (wherever applicable) of this Pre-Bid document shall only guide the tenderers in submitting the actual design proposal for this project. The Drawings shall be referred to as a guide for the minimum standard and requirements of the Government. Further improvements and refinements to the said concept design are highly expected from the tenderers, and they shall comply with all the design requirements as stipulated in the Pre-Bid document.

1.2 THE SITE

1.2.1 Refer to **Appendix 1 – Project Brief** for the project's designated site in terms of location, approximate site area, and site condition descriptions.

1.2.2 All tenderers shall visit the site to understand the site locality's actual conditions and evaluate its strengths, weaknesses, opportunities, and constraints for design decisions. Any claims on the grounds of lack of knowledge of any off-site or site condition shall not be considered.

1.2.3 The successful tenderer shall undertake pre-computation surveys by a licensed land surveyor to confirm the site boundaries. It shall be endorsed by *Ketua Pengarah Tanah dan Galian* (KPTG/PTG) for West Malaysia projects. As for projects in Sabah and Sarawak, references shall be made to the respective local authority. The successful tenderer shall also undertake complete engineering surveys, indicating the existing topography, structures, vegetation, and relevant services within and outside the boundaries.

1.2.4 The successful tenderer shall provide the site boundary demarcations and all other boundaries separating the site's zones. This exercise shall be verified by KPTG/PTG or by the approving local authority.

1.2.5 The successful tenderer shall complete engineering surveys inclusively indicating the existing topography, structures, vegetation, and services within and outside the boundaries (e.g., utility mapping) relevant to the site's development.

1.2.6 The successful tenderer shall verify with the approving local authority the planning guidelines of the proposed site. Planning guidelines such as plot-ratio, maximum height, usable plinth area, and other corresponding guidelines shall be adhered to accordingly.

1.3 APPOINTMENT OF CONSULTANTS

1.3.1 The tenderers shall appoint an Architect registered with the Ministry of Finance (MOF) and Lembaga Arkitek Malaysia (LAM) with experience in the specific area as required by the Government. Copies of a valid certificate of registration that indicates the name and registration date shall be included in the submission.

1.3.2 The consultant Architect's appointment shall include the design, supervision, and certification of works during the construction period and the defects liability period described further in the government brief. The consultant shall have an adequate and qualified design team and supervisory staff on site.

1.3.3 The engagement of the Architect, preferably to fulfil the following requirements:

a) Experienced in designing and completed one (1) hospital project.

OR

b) Experienced in designing and completed one (1) specialised health facility building or complex project (Category 1 of Architect Scale of Minimum Fees, Rules 2010 or the latest edition published by LAM).

c) The consultant shall have an experienced, adequate, and qualified team of designers (minimum 1 Principal Architect, Project/Senior Architect, and technical staff for producing drawings) and supervisory staff on-site, including Resident Architect (minimum Part II LAM and Inspector of Works registered with LAM).

d) Not more than one (1) design proposal submission is allowed by the same consultant in the tender.

1.3.4 The tenderers shall appoint a Medical Planner and the engagement of the Medical Planner, preferably to fulfil the following requirements:

a) Experienced in designing and completed two (2) hospital projects.

b) Experienced and preferably qualified local Medical Planner with architectural qualification/background.

1.3.5 The tenderers shall also appoint other consultants as follows:

a) Medical Equipment Planner for preparation of Group 1, 2, 3 and 4 medical equipment listing as follows:

Group 1 – Fixed equipment related to Mechanical & Electrical (supply & install by Contractor as per contract document).

Group 2 – Fixed equipment related to Mechanical & Electrical (supply by Client and install by Contractor).

Group 3 – Loose equipment (equipment supply & install by Client).

Group 4 – Loose and consumables items (Non-related to Mechanical & Electrical).

b) Town Planner.

c) Interior Designer.

d) Landscape Architect.

e) Other consultants that may be required by the Local Authority and/or Government (e.g., Lab Specialist, Acoustic Specialist, Nuclear Medicine / Radiation Specialist etc.).

1.3.6 All consultants must be registered with MOF and their respective boards as required by the Government.

1.3.7 The tenderers shall submit copies of a valid certificate of registration that indicates the name and registration date with curriculum vitae (CV) of all appointed consultants.

1.3.8 The successful tenderer shall include in the submission of the Letter of Intent (LOI), the Memorandum of Agreement (MOA) between the tenderer and consultants (Architect and Medical Planner), and Terms of Reference (TOR) of each consultant to the government satisfaction.

1.3.9 Where it is required for Building Information Modelling (BIM), the BIM models shall be provided in accordance with the Government's Technical Requirements, *Garis Panduan BIM JKR* and *Piawaian BIM JKR*, unless otherwise specified in the BIM Project Execution Plan (BPEP) and subject to the P.D.'s acceptance, minimum as follows:

ITEM	FORMAT
Outline of BIM Project Execution Plan (BPEP)	.pdf/ .doc
Coordinated Design Architectural BIM Model	.rvt & .nwc
Spatial Analysis Report based on Architectural Model	.pdf
Tender drawings documentation in softcopy	.dwfx

1.3.10 The successful tenderer shall conduct an assessment using the green rating tools to evaluate the level of sustainability achieved for the project in accordance with *Surat Arahan KPKR Bil.2/2020: Pelaksanaan Penarafan Hijau Bagi Projek Jabatan Kerja Raya Malaysia (JKR)* and *Garis Panduan Pelaksanaan Penarafan Hijau bagi Projek-projek JKR* by Cawangan Alam Sekitar & Kecekapan Tenaga (CASKT).

SECTION 2.0: SCOPE OF WORKS

2.1 The architectural works shall consist of design, planning, preparation, production of drawings, and specifications. The subsequent implementation, construction (including supervision by qualified professionals), completion, commissioning, handing-over in approved condition, and maintenance of the said project shall consist of, but not limited to the following components as specified in **Appendix 1 - Project Brief**.

2.2 The detailed requirements for Building Works shall be laid out in the Project Brief. The requirements given shall be indicative, and the tenderers shall include suggestions or improvements to their proposals.

2.3 All information provided in the pre-bid document shall be intended to assist the tenderers in the design and shall not be read as the only features or facilities required and/or constrained to the design. The tenderers shall understand each area's intended purposes and functions to satisfy the Government's requirements.

2.4 The tenderers shall also be responsible with providing a complete design and building facilities for each area's proper function and efficient operation. The tenderers' failure to comply with the said requirement shall not entitle the tenderers to any additional payment and time whenever the tenderers are instructed to design, build, or install such facilities.

2.5 The detailed scope of works for other facilities and services, wherever applicable, shall be as mentioned in other relevant works and technical brief of requirements in the pre-bid document.

SECTION 3.0: SCHEDULE OF ACCOMMODATION (SOA)

3.1 The tenderers shall prepare a detailed Schedule of Accommodation (SOA) based on the requirements outlined in the Project Brief. The brief indicates the number of rooms required, estimated space area, and the rooms' functions, which shall guide the tenderers to develop good working and detailed architectural drawings.

3.2 The tenderers shall follow as closely as possible space and building requirements in the brief. Where the size of a room/area has not been specified, the tenderers shall propose appropriate and adequate sizing for the proper functioning of that room/area. Any deviation to the requirements shall be brought to the attention of the Project Director (PD) concurrence and the Client's approval. (Refer minimum floor area for each rooms/areas of SOA approved in Value Assessment, where applicable).

3.3 The tenderers shall comply with the latest *Garis Panduan dan Peraturan Bagi Perancangan Bangunan* by *Jawatankuasa Standard dan Kos*, *Unit Perancang Ekonomi* (EPU), *Jabatan Perdana Menteri,* Malaysia.

3.4 The tenderers shall propose the net and gross floor areas for each of the functional spaces required. The tenderers may include in the proposal; own suggestions, new ideas, or improvements on all aspects of design, construction, and the finished materials used, following their best professional judgment in fulfilling the Needs Statement's requirements.

3.5 The tenderers shall allow adequate space or room for circulation, mechanical and electrical requirements, medical equipment installations and maintenance, and any other space requirements not mentioned in the schedule or not shown on the concept drawings.

3.6 The tenderers shall ensure the spaces provided fulfill the functional requirement in the Project Brief and Medical Brief of Requirement (MBOR) to the Government's satisfaction. The successful tenderers shall bear all costs for any inadequacy of the spaces proposed for the said project.

3.7 A detailed schedule of accommodation shall be part of the proposal as shown in **Appendix 2 - Schedules of Accommodation and Finishes**. This schedule must be endorsed and verified by a professional consultant Architect / Medical planner and the tenderers.

SECTION 4.0: ARCHITECTURAL DESIGN GUIDELINES

4.1 GENERAL

4.1.1 The project's overall design and planning shall incorporate all the required buildings and facilities specified in the Project Brief and reflect its operational policies.

4.1.2 The project scope and design requirement shall comply strictly with the latest stipulated Government Circulars, Guidelines (as in the *Garis Panduan dan Peraturan Bagi Perancangan Bangunan Oleh Jawatankuasa Standard dan Kos*), other Acts and Regulations.

4.1.3 The design requirement and layout of standard rooms for clinical and non-clinical areas/rooms can be referred to the JKR Standardised Room Data for Health Facility document as reference.

4.1.4 The hospital design (e.g., hospital blocks, quarters, supporting, and related blocks) shall be uniform, innovative, contemporary, and unique. The design shall be able to blend with the local context and the local authority requirements. The design shall be flexible in usage and with minimal maintenance. All building façade design in the project shall have a unified and harmonious character to the Government's requirement.

4.2 MASTER PLANNING

4.2.1 The building shall be designed to suit the site conditions (e.g., hilly areas, swamp areas, coastal areas, etc.). The design shall maintain the naturally hilly terrain as much as possible. Cutting the slopes for the preparation of infrastructure and building works on hilly terrain shall be following the latest *Garis Panduan Perancangan Pembangunan di Kawasan Bukit dan Tanah Tinggi* by *Kementerian Perumahan dan Kerajaan Tempatan* (KPKT) and other related recent guidelines for the coastal, swamp, and mangrove areas.

4.2.2 The overall design shall meet the project's brief spatial and functional requirements and allow for future expansion or extensions within the development. The master plan shall be a flexible design to accommodate future expansion if required (refer to the Project Brief). The expansion, upgrading, refurbishment, and renovation works must not disrupt the hospital's daily operation when carried out.

4.2.3 All areas shall be designed to achieve adequate cross ventilation and natural lighting. Any deep planning design shall be avoided, or otherwise, internal courtyards for ventilation and natural lighting or mechanical ventilation system shall be provided.

4.2.4 The overall external planning design shall provide a healing environment and accessible from internal areas/rooms.

4.2.5 The design shall also incorporate alternative access and exit point from the main road.

4.2.6 The overall planning design shall incorporate efficient traffic flow (segregation of vehicles flow) within the hospital as follows:

a) Criss-crossing of traffic flow among patients, visitors, staff services, and goods shall be avoided.

b) General Access:
Patient flow, public flow, staff flow, and vehicle flow.

c) Emergency, Support Services, and Distribution Flow:
Ambulance and other emergency vehicles, gas supply, foods, drugs, consumables, linen, equipment, waste management, and as required in the Project Brief.

4.2.7 Security and safety planning shall be considered in the project's design. It shall be reflected in both the master plan and detailed planning in compliance with Chief Government Security Office/*Pejabat Ketua Pegawai Keselamatan Kerajaan Malaysia* (CGSO).

4.2.8 The design shall consider good planning and functional inter-relationship between various clinical departments, support service areas, and residential areas.

4.2.9 An adequate number of parking lots (e.g., car, motorcycle, bicycle, bus, etc.) shall be provided and in accordance with local authorities' requirements unless otherwise stated in the Project Brief or Client’s requirement (MBOR).

4.2.10 The design shall incorporate a covered walkway from the large parking areas to the hospital blocks nearest public entrance.

4.2.11 The design shall consider green spaces for a landscape that can be a buffer zone between parking and buildings, reduce heat island effects, and for use as an assembly area.

4.3 BUILDING PLANNING AND DESIGN

4.3.1 The design shall create an ordered composition with associated functional requirements of building elements in a stimulating form that successfully combines acceptable standards of space, height, form, and scale.

4.3.2 The design shall create a high-quality working environment, both externally and internally, to provide an enjoyable, convenient, and safe hospital for all patients, visitors, and staffs.

4.3.3 Access to the hospital building shall be classified into three groups, namely:

a) Public: Direct access for the public to the clinical block.

b) Restricted: Closely related to public access area and incorporated areas of medical functions such as for emergency services, medical facilities, etc.

c) Support Services: Access for the primary non-medical support services, engineering facilities, building services, etc.

4.3.4 The design shall satisfy the clinical and functional requirements, operational policies, and technical specifications defined in the tender documents.

4.3.5 The layout design shall minimize travelling distance from the patients, visitors, and staffs. Patients and staff's circulation shall be segregated from the visitors and services circulation.

4.3.6 The design shall incorporate efficient workflow (segregation of clean and dirty flow) within the hospital as follow:

a) Workflow:
Patient flow, public flow, staff flow, material flow, services flow, and vehicle flow.

b) Distribution Flow:
Foods, drugs, consumables, linen, equipment, and as required in the MBOR.

c) Criss-crossing of traffic flow among patients, visitors, staffs, services, and goods shall be avoided.

4.3.7 *Surau* or prayer rooms shall be orientated to the *Qiblat* (direction of prayer) and segregated between genders. Ablution facilities shall be attached/annexed to these praying areas.

4.3.8 All halls, auditorium, conference room, *surau*, and other related rooms/areas of similar nature shall be designed column-free and without any obstruction of view.

4.3.9 Internalised rooms for habitable usage shall be avoided.

4.3.10 Minimum floor to ceiling height clearance is 3000 mm high.

4.3.11 The space above the ceiling to the soffit slab shall be a minimum of 1500 mm clearance to accommodate all service conduits, ducting, and piping for installation and maintenance purposes. The height of the basement, if provided, shall not be less than 2500 mm clear height.

4.3.12 The design shall consider the non-medical services in a separate zone from the rest of the hospital's support services.

4.3.13 Stores and storage rooms shall be functional and well ventilated to avoid dampness and comply with the *Jabatan Bomba dan Penyelamat Malaysia* (JBPM) and Uniform Building By-Law 1984 (UBBL) requirements. Where required, stores or rooms storing drugs, x-ray films, or other sensitive equipment (refer to Project Brief) and materials shall be provided 24 hours air-conditioning.

4.3.14 Integration to all existing systems such as power supply station, IT, telecommunication, building automation system, fire integration system, sewerage, roads but not limited as above; shall include upgrading the existing facilities whenever necessary for the proper, efficient function, operation, and safety of the system.

4.3.15 All piped services, risers, and cable ducts shall be concealed when running through the walls or ceiling. All exposed services/ducts shall be adequately boxed up and camouflaged to blend in with the interior design.

4.3.16 The tenderers shall provide an adequate number of public amenities such as public telephones and toilets at appropriate locations and incorporate them into the design layout. The public toilets shall be located near the public areas but isolated from sight. The tenderers shall also provide vending machines, power points, and water outlets at locations such as waiting areas and lounges and incorporate them into the design layout.

4.3.17 The administrative areas shall adopt an open design concept and shall consider natural lighting with views.

4.3.18 Ceiling height with a minimum of 4500 mm shall be provided for medical storage (for stacking of goods) and kitchen in the Catering Department. It shall be well ventilated unless otherwise specified. The design layout shall comply with the latest guidelines of Good Manufacturing Practice (GMP).

4.3.19 The design for the kitchen in the Catering Department shall adopt:

a) A 'dry kitchen' concept using mechanised food serving system or unless otherwise specified.

b) An integrated easy-clean ceiling system shall be installed for hoods. Provision of grille and ducting for exhaust fan and ventilation system shall comply with M&E requirements.

c) All drains inside the Catering Department's kitchen shall be lined with stainless steel sheets (curved or chamfered edges) with floor traps and covered with stainless steel gratings for easy maintenance. All kitchens shall be provided with grease traps.

4.3.20 Forensic/Mortuary Department shall be provided with stainless steel drain complete with stainless steel gratings and floor traps.

4.3.21 All 24 hours air-conditioned rooms shall refer to JKR Building Standards and Specifications and JKR Guidelines on The Prevention of Mould Growth in Buildings.

4.3.22 All doors and lifts must be of clear dimension (width and length) to allow wheelchair access and mobile equipment transportation (e.g., x-ray machine, trolleys, and ICU beds).

4.3.23 Sound transference between spaces above ceilings and other openings must be avoided.

4.3.24 Soundproofing for noise reduction shall be provided as defined in output specifications. Soundproofing shall be provided to the following areas:

a) Clinical examination, treatment, procedure, and consultation rooms areas.

b) Confidential areas such as reception desks (i.e., Accident and Emergency (A&E), Outpatients, Staff Bases, consultation or counselling rooms, etc. where the transfer of patient and other confidential information takes place).

c) As required, patient testing areas (i.e., activities room such as multi-sensory room, audiometric test room, etc.).

d) Patient resting areas (e.g., Wards, Daycare, etc.).

e) Large joint facilities such as rehabilitation, seminar, conference room, auditorium, etc.

4.3.25 The noise level (NC), background noise criteria and sound pressure level for various areas shall comply as tabulated in Mechanical Works Brief.

4.3.26 Arrangement of beds in all wards shall avoid direct sunlight to the patients.

4.3.27 Patients' rooms in the wards shall consider low window design to allow outside view even when patients are lying on beds.

4.3.28 The wards' design shall allow for an open and friendly environment, but the arrangements shall be made to ensure privacy for patients and their visitors when required. The design shall consider easy observation between staff and patients from the staff base.

4.3.29 All non-air-conditioned wards and nursing stations (if any) shall be well ventilated.

4.3.30 Openings complete with anti-vermin netting shall be placed at a minimum of 150 mm above the finished floor level and shall be casement or magnetic type to maximise cross ventilation. The materials used for the openings shall be fungus-free and of low maintenance.

4.3.31 Lighting in multi-bed patient rooms and inter-departmental corridors shall be appropriately located and not directly to the patient's eyes.

4.3.32 All patient rooms shall have night-lights, either set in the wall at a low height or incorporated in over-bed light. Switches for night-lights shall be located outside the corridor or near the room entrance/door.

4.3.33 The tenderers shall propose colourful, quality, and easy maintenance murals/posters/graphics along public corridors, in the paediatrics areas, ward areas, and any other places as specified (e.g., ceilings, floors or walls) where required to achieve a lively and cheerful environment to the PD's approval.

4.3.34 Wards shall be designed to maximise the working environment's efficiency, ensuring minimum travel distance while treatment is carried out at the bedside and in clinical treatment areas.

4.3.35 The tenderers shall provide bed head panels complete with medirail 450 mm and 1000 mm from finish floor level (FFL) behind and above beds in the wards and other areas as required.

4.3.36 Prayer rooms with ablution facilities shall be shared among staff, patients, and the public unless otherwise specified. Depending on the design and layout, the prayer rooms shall also be shared between departments, units, and wards unless otherwise specified. The ablution area shall be well ventilated.

4.3.37 Wherever x-ray and radiotherapy equipment are used, radiation leakage shall be avoided. The rooms shall have an adequate shielding protection in accordance with established radiation authorities and standards. Radiation protection shall comply with related standards/guidelines, and obtained approval by *Bahagian Kawalselia Radiasi Perubatan*, MOH.

4.3.38 Wherever pharmacy and clean room are required, including equipment used, these requirements shall comply with guidelines and obtained approval by Bureau Pharmaceutical Services Division, MOH.

4.3.39 Linen cabinets where required shall be provided with double doors and well ventilated.

4.3.40 The wet and dry areas for staff and patients' changing rooms shall be segregated physically.

4.3.41 The tenderers shall design appropriate storage space for clinical areas, supplies, and archives that can be easily accessed and secured.

4.3.42 Inflammable store shall be constructed separately from the main building with proper ventilation in compliance with guidelines on the storage of hazardous chemicals as per Guideline of Storage Hazardous Chemical by the Department of Occupational Safety and Health Malaysia (DOSH) and JBPM.

4.3.43 The design of laboratories shall be of modular and open concept. All high-risk laboratories shall have an airlock with a separate air-conditioned and exhaust system.

4.3.44 Toilets in the ward areas shall not deprive the main ward areas of getting most windows needed for adequate ventilation and natural lighting, especially in the non-air-conditioned areas.

4.3.45 Windows shall be provided as much as possible to all habitable areas such as wards, waiting area, consultation and examination (CE), crisis, family grieving, cafeteria, and other areas (if any) with a good view and natural lighting. Priority should be given to the patient's area, followed by visitors and staff.

4.3.46 Disposal of healthcare and nuclear waste services (if any), linen services, laundry services, engineering services, and cleaning services shall be managed. Consideration shall be given in terms of space provided for the vehicular access and the temporary storage/holding area before the pickup services.

4.3.47 All medical gases and liquefied petroleum gas (LPG) tanks shall have a dedicated loading area conveniently accessible for deliveries and supplies. Locations and layout details shall be designed to comply with the approving authorities.

4.3.48 All sub-main switchboards and distribution boards for M&E services shall be concealed or hidden at appropriate locations as to not interfere with the architectural or interior design works. Decorative compartments or panels shall be provided to overcome the problem.

4.3.49 Design of MOH dental clinics or department shall comply to *Dasar Operasi dan Perancangan Pembangunan Fasiliti Kesihatan Pergigian Kementerian Kesihatan Malaysia* and guidelines of *Konsep Rekabentuk dan Pemasangan* Dental Wax and Plaster Trap *di Makmal Pergigian* by Oral Health Division, MOH, Malaysia.

4.3.50 Special design plaster trap for the hospital shall be provided for the sink at the plaster room and dental laboratory to avoid blockage to the drainage pipes described in the guidelines of *Konsep Rekabentuk dan Pemasangan* Dental Wax and Plaster Trap *di Makmal Pergigian* by Oral Health Division, MOH, Malaysia.

4.3.51 Lifts and staircases shall be strategically located within the design, including providing dedicated routes for certain services, in line with clinical/medical needs (e.g., A&E, OT, and designated wards).

4.3.52 All open corridors shall integrate scupper drain and adequate water outlet/concealed downpipes and be aesthetically integrated with the overall façade design.

4.3.53 All public amenities such as public toilets, *surau,* and M&E services shall be efficiently designed with stackable layouts.

4.3.54 Corridors shall be designed with a clear minimum width as below:

a) Hospital streets: 3000 mm.

b) Inter-departmental corridor except for A&E and OT departments: 2400 mm.

c) A&E and OT departments: 2700 mm.

d) Services and materials corridor: 2100 mm.

e) Staff corridor at office area: 1200 mm.

4.3.55 Covered porch designs shall be fully covered with a minimum of 2 lanes for the main entrance lobby and all other locations as required, such as Rehabilitation, Haemodialysis, and loading/unloading areas, which include Medical Store, Catering, Mortuary and Privatised Support Services Department.

4.3.56 Emergencies drop off for A&E and Patient Assessment Centre (PAC) shall be fully covered with a minimum of 3 lanes with 4.5 m height clearance to accommodate: ambulance patient, public patient, and vehicle passing. The road design shall comply with *Arahan Teknik Jalan JKR.*

4.3.57 Where applicable, a reinforced concrete slab is required at the topmost floor and roof, covering:

a) 24 hours air-conditioned area.

b) room with medical equipment support at the ceiling.

c) room with M&E services room below.

4.3.58 Drive-through counter shall be fully covered and integrated with the building façade where required. Delivery should be on the driver's right-hand side.

4.4 SUSTAINABLE DESIGN

4.4.1 The building shall be designed to reduce the use of fossil fuel, water efficiency, instead implement use of sustainable materials.

4.4.2 The successful tenderer shall plan, design, and construct the building by taking into consideration the following, but not limited to:

a) Catering for cultural diversity of the building usage.

b) Effective space planning for usage and maintenance.

c) Ease of maintenance, including accessibility for maintenance purposes.

d) Security and safety.

e) Comfort and ergonomic.

f) Design for all (universal design).

g) Good indoor and outdoor environment qualities.

h) Sustainable building, energy efficient, and fulfil water tightness condition.

i) Maintainability, serviceability, and accessibility.

j) Operational efficiency completed facility.

k) Life cycle cost (Costs of Ownership).

l) Functionality.

4.5 ENVIRONMENTAL REQUIREMENT

4.5.1 All environmental requirements and needs shall be read in conjunction with the Environment and Energy Efficiency Brief.

4.6 PRESERVATION OF EXISTING TREES

4.6.1 The successful tenderer shall survey the site to locate any existing matured trees to be preserved as stated in Section 35A, Act 172 (Town and Country Planning Act 1976, TCPA). The inventory shall be addressed in the Planning Approval Submission.

4.6.2 The existing matured trees identified and approved by local authorities shall be conserved (retained) or relocated, following the Act / Local Authorities' requirements.

4.7 TRAFFIC MANAGEMENT

4.7.1 All traffic management requirements and needs shall be read in conjunction with the Civil Engineering Works Brief.

4.7.2 Wherever required, the successful tenderer shall consider the traffic management strategy planning in compliance with the relevant authorities. The traffic shall maintain smooth flow and not cause prolonged periods of idle standing to minimise congestion and pollution.

4.8 COMPLIANCE WITH DISABLED DESIGN REQUIREMENTS

4.8.1 All buildings and facilities design shall take into account the accessibility for persons with disabilities (PwD). They shall comply with By-Law 34A of UBBL 1984 Amendment 2012 and MS 1184: 2014 Universal Design and Accessibility in Built Environment – Code of Practice and provide access

to enable ease of movement for PwD to get into, out of, and within the building.

4.9 COMMON AMENITIES

4.9.1 An adequate number of common amenities/facilities shall be provided following the Local Authority's requirements and located at suitable and accessible locations for hospital and quarters.

4.9.2 The public toilets shall be near the public areas, away from sight, and the design shall be per MS 2015-1:2017 Public Toilet Part 1: Design Criteria and MS 1184: 2014 Universal Design and Accessibility in Built Environment – Code of Practice.

4.9.3 The design of nappy changing (baby changing / parenting room) facilities shall be father-friendly.

4.9.4 The tenderer shall also provide sufficient numbers of auto teller machine (ATM) and vending machine power points, complete with other technical requirements such as Local Area Network (LAN), water inlet, and outlet at approved locations, or where required.

4.9.5 Refuse bin facility shall be provided according to the authorities' requirements and approval. Refuse bin facility shall be designed with roof coverings, water tap, light fittings, discharge points, and proper ventilation.

4.9.6 Recycle bin areas shall be provided at strategic points and shall be sheltered from weather elements.

4.9.7 Refuse from construction activity shall be sorted and disposed of according to good practices as stipulated in the pHJKR / MyCREST rating tool.

4.10 EXTERNAL WORKS DESIGN

4.10.1 Anti-climb perimeter fencing shall be provided where security aspects are vital to the nature of the building. The minimum height shall be 2400 mm anti-climb hot-dipped galvanized security fence with a minimum 300 mm height concrete base and 300 mm height Y barb tape.

4.10.2 Galvanized iron (GI) mesh security perimeter fencing and gates of approved design and standards shall be provided. The minimum height of the perimeter fencing shall be at least 2100 mm with a minimum of 150 mm high concrete curb from ground level.

4.10.3 All security and safety aspects shall comply with local authorities, including the TNB block and sewerage treatment plant.

4.10.4 Decorative fencing of 2400 mm of minimum height shall be provided at the road frontage where the main entrance gate is located (Refer Appendix 1 – Project Brief). The design of the decorative fence shall complement the design of the guardhouse and the gate.

4.10.5 A reasonable number and size of flagpoles shall be proposed to the PD's concurrence where required. It shall be erected in a prominent area, e.g., main porch or plaza. Poles shall be stainless steel or of equivalent non-corrosive materials.

4.10.6 The design and details of the porch and linkways shall be coordinated with the main building linkways shall be designed to harmonize with overall building planning.

4.10.7 Covered walkways shall be provided with adequate roof overhang design (minimum width of walkway: 1500 mm), and all walkway floors shall be finished with non-slip finishing materials, flush, level, and complete with proper drainage. Ramps of suitable gradient shall accompany all level drops and steps.

4.10.8 All detailing for link ways, walkways, gratings, and ramps shall be suitable for the disabled, wheelchair users, and trolley movement following MS 1184: 2014 Universal Design and Accessibility in Built Environment – Code of Practice.

4.10.9 All drains and sumps located at the gathering area, along main pedestrian walkways, and near public areas shall be covered entirely or concealed for safety reasons and aesthetics.

4.10.10 Non-suspended concrete aprons, if provided, shall be of a minimum width of 1200 mm and shall be detached from the building's structure.

4.10.11 Concealed perimeter drains shall be provided with accessible openings at every 3000 mm intervals. These openings shall be covered with galvanized heavy-duty steel grating or precast concrete slabs with appropriate finishes and secured to the base.

4.10.12 All parking for the Government’s vehicles shall follow *Pekeliling Arahan Perbendaharaan Malaysia WP 4.1: Pengurusan Kenderaan Kerajaan.*

4.11 INDUSTRIALISED BUILDING SYSTEM (IBS)

4.11.1 The project shall be implement using the Industrialised Building System (IBS) unless otherwise specified.

4.11.2 The project shall comply with *1Pekeliling Perbendaharaan PK1.1 / Perenggan 6 (viii).* The tenderers shall use IBS construction methods to achieve a minimum overall IBS Score of 70%.

4.11.3 The IBS score shall be calculated using The Manual for IBS Content Scoring System (IBS SCORE) published by *Lembaga Pembangunan Industri Pembinaan Malaysia* (CIDB). IBS Score for architectural works shall be submitted together with the Tenderer's Proposal.

4.11.4 The building construction systems proposed shall be flexible-to-change without compromising the quality. The systems shall incorporate the usage of local materials and utilise local labour as per local authorities' requirements.

4.11.5 Architectural IBS Components:

a) The building's design, elements, and components shall comply with the Malaysia Standard MS 1064: 2001 Guide to Modular Coordination in Buildings or the latest edition.

b) Contractors shall be responsible for ensuring that the design and the positioning of the building services conduits are considered during the design and the manufacturing processes.

c) All structural components inclusive of wall panels and floor slabs shall consider the ultimate load and requirements of M&E equipment in the design.

d) All jointing designed for the components shall be appropriately treated concerning water tightness and aesthetics.

4.12 WARRANTY OR GUARANTEE

4.12.1 The terms and conditions for all warranties/quantities shall be subjected to the PD's concurrence and the respective material accordingly.

4.13 DESIGN CONSIDERATIONS FOR MECHANICAL AND ELECTRICAL (M&E) REQUIREMENTS

4.13.1 The details of M&E requirements shall be read in conjunction with the M&E Works Brief of this tender document.

4.13.2 Adequate spaces shall be provided for M&E plant rooms, Air Handling Unit (AHU) rooms, electrical switch rooms, substations, sub-switch rooms, and other M&E requirements that shall be necessary for the functioning of the building. Adequate space above the ceiling shall be provided to accommodate all service conduits, ducting, and piping for installation and maintenance purposes.

4.13.3 All amenities, services, and equipment rooms shall be efficiently designed and accessible with stack-able layouts.

4.13.4 Internal service rooms shall be avoided, and if there are any, some form of the mechanical ventilation system shall be provided.

4.13.5 All M&E services shall be accessible from the service corridor or outside the clinical area/department.

4.13.6 All sub-main switchboards and distribution boards for M&E services, pneumatic tubes, etc., shall be concealed or hidden in an appropriate location as to not interfere with the architectural or interior design works. Decorative compartments or panels shall be provided to overcome the problem.

4.13.7 All piped services, risers, and cable ducts shall be concealed if they lay through the walls or ceiling. All exposed services/ducts shall be adequately boxed up and concealed and blend in with the interior design.

4.13.8 All mechanical areas shall have a 50 mm drop finished floor level relative to adjacent areas, complete with adequate stainless-steel floor traps.

4.13.9 All electrical areas finished floor level shall be raised 50 mm relative to adjacent areas.

4.13.10 All services and equipment rooms shall be adequately ventilated and protected from weather elements. The walls shall either be tiled or plastered and painted with acrylic paint or other approved alternative finish for easy maintenance.

4.13.11 Conduits running above ceiling level at external corridors and link ways shall be concealed with an approved ceiling system, especially public areas, for aesthetic and security reasons. Ceiling access openings shall be

provided for maintenance purposes. Cable access for all necessary electrical rooms shall be provided.

4.13.12 Clinical and noise-sensitive areas such as OT room, ICU, HDW, Wards, meeting rooms, discussion rooms, offices, and other areas as required shall not be located adjacent to AHU room, cooling tower, air-conditioned condensing unit, chiller, plant room, pump room, etc. Effective acoustic treatment shall be provided if the above conditions cannot be met.

4.13.13 Staircase shall be provided to service rooms or floors for maintenance.

4.13.14 No maintenance manholes/junction boxes of any services shall be allowed in the clinical areas, clinical support area, circulation areas inside the building and in the middle of the road.

4.13.15 Machine/plant/equipment rooms and service riser/shaft shall be provided with floor trap except for electrical services room/riser.

4.13.16 Riser for electrical, telecommunication, and IT services shall be separated from mechanical services, especially the water pipes, to eliminate electric short-circuit risk.

4.13.17 AHU room design requirements shall comply to the latest edition of Mechanical System Design and Installation Guidelines for Architects and Engineers by *Cawangan Kejuruteraan Mekanikal*, JKR. The requirements are as follows, but not limited to:

a) Room to be airtight (excluding the opening for fresh air intake) and vermin free.

b) Room doors shall be of double leaf and open outwards.

c) Rooms shall not be located next to toilets to prevent the contamination of fresh air intake.

d) Rooms shall be provided with water taps and floor traps for maintenance purposes.

4.13.18 Any laboratory, which requires an airlock, shall have its own air-conditioned and exhaust system.

4.13.19 Adequate spaces shall be provided for safe operation and maintenance of M&E machines or equipment. The distance between the machine/equipment shall not be less than 1 meter to allow safe operation and maintenance work to be done.

4.13.20 All hose reels for firefighting shall be compartmentalised with sufficient space for easy access and usage. Such compartments shall not encroach into circulation areas. Floor traps shall be provided inside the compartments for maintenance purposes.

4.13.21 Stainless steel grease trap system shall be installed in all kitchen areas, food processing and food preparation areas, and other areas necessary.

4.13.22 For air-conditioned spaces where condensation will likely occur, the temperature and humidity shall comply with the JKR Guidelines on The Prevention of Mould Growth in Buildings.

4.13.23 Air-conditioned condenser units and other exposed mechanical services such as cooling tower etc., where installed, shall be located inconspicuously in an orderly manner, well ventilated, and protected from direct sunlight.

4.13.24 The successful tenderer shall install sub-meters of primary water usage such as irrigation, cooling towers at every block, or tenant to monitor water usage and leaks detection. For energy monitoring purposes, sub-meters for electrical, water, and gases shall be provided at strategic locations (refer to M&E Works Brief).

4.13.25 Luminaries fittings shall be recessed to reduce dust collection, ease of cleaning, and maintenance.

4.14 MAINTENANCE

4.14.1 Considerations for ease of maintenance, servicing, and cleaning works shall be emphasised on all building designs.

4.14.2 An area for the maintenance office shall be provided and easily accessible.

4.14.3 All windows and doors, ceiling, fittings (including M&E fittings and curtains), architecture features, etc. at a considerable high level shall be provided with an appropriate pre-planned mechanism or fixed structures for easy maintenance and cleaning purposes such as built-in motorised devices, scissor-lift/man-lift, catwalks, cat ladders, etc.

4.15 SAMPLES AND MOCK-UPS

4.15.1 The successful tenderer shall set up mock-ups and submit samples of all finishes, fittings, and accessories complete with colour scheme, where applicable, for PD's concurrence before actual installations.

4.15.2 The successful tenderer shall arrange factory/showroom visits prior to producing and selecting materials, equipment and/or furniture.

4.15.3 The approved samples of all finishes, fittings, and accessories shall be appropriately mounted on sample boards with labels and shall be placed at the site office for reference.

SECTION 5.0: ARCHITECTURAL COMPONENTS, MATERIALS AND FINISHES

5.1 GENERAL

5.1.1 Architectural components, materials, and finishes used for the building shall follow respective categories as stated specifically in the *Garis Panduan Dan Peraturan Bagi Perancangan Bangunan Oleh Jawatankuasa Standard Dan Kos, Unit Perancang Ekonomi (EPU), Jabatan Perdana Menteri* (2015 or latest edition) and other acts and regulations.

5.1.2 Types of finishes shall not be inferior to the standards given and shall be of the highest quality within the approved category and subject to the PD's concurrence. Finishes proposed for all building elements shall suit the buildings/rooms' intended functions and benefit the project requirements.

5.1.3 Materials and construction methods in a coastal environment or close to water body should be resistant to flood and wind damage, wind-driven rain, corrosion, moisture, and decay (i.e., due to sunlight, aging, insects, chemicals, temperature, or other factors) and shall comply with current:

a) *Garis Panduan Perancangan Pemuliharan dan Pembangunan Kawasan Sensitif Alam Sekitar* PLANMalaysia.

b) Guidelines on Physical Development Planning for Island and Marine Parks PLANMalaysia.

c) *Garis Panduan Pembangunan Persisiran Pantai* JKR.

5.1.4 Finishes proposed by the tenderer other than those specified shall be of equivalent high grade locally manufactured unless otherwise specified building materials and subject to the PD's concurrence.

5.1.5 Size, texture, colour, pattern, and other subjective aspects of materials and finishes shall be subjected to interaction and the PD's concurrence.

5.1.6 Anti-termite treatment shall be carried out above and underground designated areas to floor before construction following the manufacturer's instruction by a licensed applicator specified in the latest JKR Standards Specification for Building Works.

5.1.7 The successful tenderer shall provide a five (5) years warranty from the date of Practical Completion (CPC) against any termite attack to the works that may arise due to any defect, fault, or ineffective anti-termite treatment. The terms and conditions of the warranty shall be to the PD's concurrence.

5.1.8 All building materials and fittings, which are of metal such as ironmongery, roof, etc., shall be rust-proof, or otherwise, alternative non-metallic materials may also be used.

5.1.9 Use of locally manufactured products shall be encouraged throughout the project in accordance with the current government circulars.

5.1.10 Any paints, coatings, primers, and adhesives, when used for internal areas, shall be water-based and the Permissible Exposure Level (PEL) to formaldehyde or any carcinogen as adopted by OSHA.

5.1.11 All materials shall follow the minimum requirements specified in the latest JKR Standard Specification of Building Works or unless otherwise specified.

5.1.12 A detailed schedule of internal and external finishes for walls, floors, and ceiling shall be drawn up and submitted as part of the proposal in the form of all room layouts with elevations on all sides as shown in **Appendix 2 – Schedule of Accommodation and Finishes.** The specification shall only be indicative and not exhaustive.

5.2 ROOF COMPONENTS

5.2.1 The roof design and materials shall have absolute water tightness. The method of installation, fixing, and fastening of roofing materials, caps, flashings, insulation, and expansion joints, whenever required, shall strictly conform to the manufacturer's specification and installation method.

5.2.2 All roofing works and heat insulation specifications shall comply with the latest JKR Standards Specification for Building Works.

5.2.3 All roof designs must have complete protection from birds, bats, rodents, etc., from entering the roof space. Exposed trusses and parapet walls shall be avoided, and soffits shall be provided to all the roof eaves.

5.2.4 All roofs shall have minimum width overhang as below:

a) Building: 1500 mm.

b) Canopy and awning: 1200 mm.

c) External corridor: 1500 mm.

5.2.5 The reinforced concrete flat roof design is not allowed. If unavoidable, a reinforced concrete flat roof shall be designed with double roofing where

metal deck or other approved materials shall act as a primary roof covering above the reinforced concrete slab to prevent leakage and water ponding.

5.2.6 Suppose a reinforced concrete flat roof is used. In that case, it shall be provided with high performance and chloride-free material waterproofing system, with a bonded warranty for not less than ten (10) years in addition to a general warranty provided by the contractor. The sample of material shall be submitted for the PD's concurrence.

5.2.7 The roof used shall be of a complete roofing system consisting of tiles, fittings, roof system components, and accessories designed to cater for a variety of roof finishing details in compliance with the manufacturer's technical specifications, including minimum recommended pitch of the roof (roof tiles gradient). The colour of the tiling fillers shall match the colour of the roof tiles.

5.2.8 Roof tiles shall conform to MS 297, and unless otherwise specified on the drawings, they shall be laid on the metal trusses system to engineer's details and PD's approval. The tiles shall be free from all defects and fungus.

5.2.9 Whenever metal roof decks are used, it shall be a concealed fixing system of a minimum of 0.48 mm thick based metal (BMT) of pre-painted aluminium and zinc-coated steel on both surfaces.

5.2.10 Gutters and Rain Water Down Pipe (RWDP):

a) All roof drainage systems shall be completed with roof accessories, including gutters, debris strainers, and RWDP with bracing. RWDP bracing shall be installed to sustain vibration from the rapid water flow.

b) Placement of gutters and RWDP shall be aesthetically integrated into the overall façade design or concealed. Numbers and sizes of RWDP shall be determined and endorsed by the Civil Engineer.

c) Wherever uPVC or zinc-alloy coating steel gutters and rainwater downpipes are used, they shall comply with MS 1063, MS 1196 and shall be provided with a bonded warranty not less than five (5) years.

d) Roof gutters shall be of non-corrosive and non-toxic materials, durable, able to resist all climatic effects, and remain dimensionally stable over time. Its profile shall complement any architectural style, easy to assemble, lightweight, and maintenance-free.

e) RWDP in reinforced concrete column shall be avoided.

f) RWDP shall be avoided inside the building, and any exposed RWDP at the circulation area shall be protected. RWDP with a siphonic system

shall be used for large roof areas to accelerate water discharge under BS 6367: Code of Practice for Drainage of Roofs and Paved Areas.

g) Gutter for marine environment shall be pre-painted finish with metallic coated steel with minimum aluminium/zinc-alloy as stipulated in the latest JKR Standards Specification for Building Works and other guidelines as listed in 5.1.3.

5.3 FLOORS

5.3.1 Floors shall be concrete slab unless otherwise specified and floor finishes are shown in **Appendix 3 – Schedule of Summary of Architectural Components and Materials**. All plastering, paving, and tiling works shall comply with the latest JKR Standard Specification for Building Works.

5.3.2 All size, pattern, and colour of floor finish materials shall be of the PD's concurrence with HODT's and the Client's verification, if necessary.

5.3.3 Workstation and computer rooms shall have anti-static vinyl floors. The raised floor system (i.e., for ICT rooms), wherever specified, shall have adequate space underneath for pedestal, wiring, cables with cable outlets, and electrical openings. The raised floor system shall be flush with the surrounding floor finishes.

5.3.4 All floor areas requiring sports activities shall be constructed and finished with appropriate systems and materials that meet sports standards. Outdoor and indoor sports court shall be finished with sports court surfacing system (e.g., rubber paint, epoxy, or PU paint finished) to the PD's concurrence.

5.3.5 All floor skirtings shall be not less than 100 mm high unless otherwise specified.

5.3.6 Vinyl

a) Vinyl sheet or vinyl tile flooring shall be of minimum 2 mm thick high-performance premium quality homogenous type (Type T or Grade 1), specified following the function of the room or area, carried out by specialists from the approved supplier of the material and complies with manufacturer's method of installation, to the following types and performances:

   i. Vinyl Type 1**:** Heavy-duty to withstand heavy traffic of trolleys.
   ii. Vinyl Type 2: Anti-static conductive to cater for aseptic and dust-free environment (meant for OT Room, Server Room, Imaging

Room or other rooms required depending on the type of equipment).

iii. Vinyl Type 3: Anti-slip to cater for wet areas as well as slippery.

iv. Vinyl Type 4: Heavy-duty, fully flexible, and resilient for sports.

v. Vinyl Type 5: High-resistant to chemical.

b) All vinyl joints shall be hot welded, with matching colours.

c) Skirting shall be bent-up of the same vinyl at 100 mm high with approved cove former. Skirting shall be finished with matching coloured uPVC capping strips, with approved acrylic adhesive strictly to the manufacturer's instruction.

d) The vinyl sheet shall be given Polyurethane Reinforced (PUR) surface treatment for easy maintenance.

e) Approved non-corrosive metal dividing clips shall be installed when vinyl flooring meets with other floor finishes.

f) Colours and patterns of vinyl flooring shall be subjected to material interaction and the PD's concurrence.

g) The successful tenderer shall ensure that the floor substrate is even, dry, and free from dust before finishing with vinyl flooring. The vinyl sheets shall be installed onto floor flatness with a tolerance of not more than $\pm$3 mm for every 3 m length floor area. A self-levelling compound of approved quality to be installed before finishing with vinyl flooring. The flatness tolerance shall strictly adhere to the manufacturer's method of installations.

h) Low Volatile Organic Compound (VOC) adhesives shall be used.

i) Laying of vinyl flooring shall only be carried out by specialists from the approved supplier of the material.

j) The vinyl flooring shall be completed with designed motifs, graphics, and the interplay of colours to the PD's concurrence for waiting areas, corridors, and other specific areas.

k) Stainless steel floor traps and/or gratings for vinyl flooring shall be of a special approved type suitable for vinyl flooring and shall conform to the manufacturer's installation method.

l) The installation of vinyl flooring shall follow strictly to the manufacture's specification. The contractor shall submit a method statement for the PD's concurrence.

m) Approved anti-slip nosing strips shall be used wherever vinyl is being laid on steps or staircases.

n) To apply approved moisture barrier vinyl sheet underlay for the floor with rising dampness moisture content 75% relative humidity (RH).

o) The vinyl flooring shall have a minimum warranty of ten (10) years to the PD's concurrence.

5.3.7 Tiles

a) In general, all ceramic tiles manufactured locally are using the dry-pressed manufacturing process. The ceramic tiles are categorised based on their water absorption rate defined in the MS 1294 or the International Standard Organization Standards (ISO 13006).

b) Tile size shall be a minimum of 300 mm x 300 mm unless otherwise specified.

c) Shade variation, which is the variation in colour, texture, and tone between individual tiles, shall be uniform in appearance.

d) All ceramic tiles for walls and floors shall be Grade A approved surface finish, texture, colour, and manufacture.

e) Ceramic tiles for walls shall be bedded with approved tile adhesive to the manufacturer's specification on 20 mm thick cement, which has sufficiently hardened. The surface of the screed shall be roughened appropriately to form a key to the tiling. The tiles shall be laid close-butt and all joints shall be filled with approved tile adhesive or coloured cement to match. Exposed edges of tiling shall be finished with tile trim on edge tiles.

f) Ceramic tiles for internal walls shall be scuff-resistant glazed vitrified tiles with water absorption more than 0.5% less than 10% [Classification Group Blb, Blla, or Bllb]. The tiles' minimum size shall be 300 mm x 300 mm, complying with MS 1294.

g) Ceramic tiles for external walls shall be scuff-resistant glazed vitrified tiles with water absorption of less than 0.5% [Classification Group Bla]. The tiles' minimum size shall be 300 mm x 300 mm, complying with MS 1294.

h) Ceramic tiles to the internal and external floor for heavy-duty areas and high traffic areas shall be fully vitrified with water absorption less than 0.5% [Classification Group Bla]. The heavy-duty tiles shall be vitreous hard-wearing non-slip glazed tiles minimum 300mm x 300mm, complying with MS 1294.

i) Ceramic tiles to internal floor areas under normal conditions shall be fully vitrified with water absorption more than 0.5% less than 10% [Classification Group Blb, Blla, and Bllb]. They shall be vitreous hard-wearing non-slip glazed tiles minimum 300mm x 300mm complying with MS 1294.

j) All accessories such as skirting (e.g., bullnose or cove base), step tiles, step nosing, edging strips, angle tiles (internal and external), etc., shall be of an approved type from the same material to match flooring. All skirting shall be 100 mm high, and stair nosing shall be a minimum of 20 mm wide laid a full length of the treads and bullnose profile and edging strips 25 mm wide.

k) The main entrance, lobby, waiting area, lift lobby, hospital streets, corridors (i.e., heavy traffic areas), and revenue collection area shall be finished with a minimum of 600 mm x 600 mm polished/unpolished full body porcelain tiles and/or granite tiles. Special floor patterns shall be integrated with ID work and to the PD's concurrence.

l) Unless otherwise stated, all lobbies, main entrance, and main public staircases shall be full-body porcelain tiles and shall be fully vitrified with water absorption less than 0.5% [Classification Group BIa] and to the PD's concurrence.

m) Staircases shall be provided with a minimum of 20 mm wide non-slip homogeneous/porcelain nosing tiles with bullnose profile, laid at the full length of the treads.

n) Toilet, pantry, kitchen, ablution, and other wet area floors shall use non-slip tiles.

o) Non-slip matt finished tiles with a minimum of 300 mm x 300 mm shall be used for toilets, wet areas, and external corridors unless otherwise specified. Finishes for toilets in special areas (e.g., VIP areas) shall be of a higher tiles range than a standard toilet.

p) All tile joints shall be filled with approved epoxy grout.

q) All exposed tile edges shall be rounded off.

5.3.8 Seamless Flooring System

a) All concrete floor slabs shall be applied with waterproofing and floor hardener following the manufacturer's recommendation before applying a seamless flooring system.

b) Epoxy coating shall be provided to areas needed as per functional requirements. Epoxy coating used shall be of high-performance epoxy resin sealer and coating in a range of colours to the PD's concurrence.

c) Epoxy paint, where specified, shall be to the approved equivalent and applied strictly in accordance with the manufacturer's instruction. The range of colours shall be to the PD's concurrence.

d) High-performance, self-leveling epoxy or polyurethane (PU) resin shall be used in areas that are subject to heavy-duty machinery and high traffic.

e) Anti-static epoxy resin shall be used in workstation and/or computer rooms unless otherwise specified.

f) Chemical resistant epoxy resin shall be used in laboratories and/or stores unless otherwise specified.

g) Polyurethane resin shall be used in areas that need hygienic clean floors and subject to thermal shocks, such as food preparation areas, cold storage, or freezer in kitchens.

h) Polished concrete, wherever specified, shall be a super flat concrete floor slab treated with an approved coat of nano lithium concrete densifier. It shall be grinded to either 800, 1500, or 3000 grit level (depending on the function) to the PD's concurrence before executing works. Polished concrete shall be low maintenance, waterproof, chemical resistant, and with the following specification:

i.	Compressive strength	:	63.8 N/mm² (ASTM C942-99)
ii.	Abrasion Resistance	:	70.3 mg weight loss & wear index at 1000 cycles (ASTM D4060)
iii.	Skid Resistance	:	Wet: 62 Dry: 82 (ASTM E303)
iv.	Water absorption	:	4.89% (BS 1881: Part 122)
v.	Pull out adhesion test	:	967 Psi (ASTM D4541)

i) Heavy duty coloured stamped or stencilled concrete or any other approved alternatives shall be used at driveways and car porches unless otherwise specified.

j) Coloured concrete floor hardener shall be provided in areas of heavy machinery works. It shall be laid with a self-levelling epoxy floor complete with floor hardener and crystallization or cementitious waterproofing. A proprietary floor hardener system shall be used and applied following the manufacturer's recommendation. Floor hardener materials shall be of high quality, heavy-duty 5 mm thick above 150 mm thick concrete floor slab.

5.3.9 Pavers

a) Pavers shall be provided to areas needed as per functional requirement:

i. Pre-cast concrete pavers shall be a minimum of 60 mm thick for light to a medium-duty application (e.g., footpaths, jogging tracks, residential driveways).

ii. Pre-cast concrete pavers shall be a minimum of 80 mm thick for heavy-duty application (e.g., roads, factory floors, container yards, aircraft parking aprons). Pavers, where specified, shall be of approved equivalent and applied strictly following the manufacturer's specification.

iii. Interlocking pavers shall be laid on sand bedding and lean concrete and shall strictly comply to manufacturer's specification. The contractor shall submit a method statement for the PD's concurrence.

5.3.10 Timber Floor Finish

a) All timber flooring works shall comply with the latest JKR Standard Specification for Building Works.

b) Timber flooring shall be provided to areas needed as per functional requirements.

c) Timber floor finish shall be high-quality timber/laminated timber to be laid on the rubberised cushioning pad on 20 mm thick cement screed on a concrete slab with an approved waterproof adhesive applied following manufacturer's specifications.

d) Timber skirting of 100 mm x 12 mm thick, chamfered at the top, shall be provided to timber strip flooring and fixed securely to the wall or column.

e) Timber strips shall be regular, even, and consistent in size with sharp well defined arises, matching colour, textured, grain, free from splits, chips, and blemishes.

f) The proprietary timber flooring system shall be following the manufacturer's specifications.

i. Solid Timber

Timber flooring shall be hardwood timber strips not less than 1200 mm x 18 mm thick. Timber flooring, where specified, shall be Group C species according to JKR Standard Specifications for Building Works.

ii. Natural Timber Laminated

Natural timber flooring shall be 14.5 mm thick (15 mm finished) made of three (3) ply engineered solid timber and excellent workmanship. The hardwood floor shall consist of three layers. Each has a specific feature to complement each other, providing improved resistance to wear. The surface shall be treated with seven (7) coats of UV lacquer, preferably pre-finished in the factory, resulting in a more durable and hard-wearing finish.

iii. Laminated Composite Flooring

Laminated composite flooring shall be of 8 mm thick pre-finished surface of anti-abrasive protective overlay according to the area's function.

5.3.11 Carpet

a) Carpet tiles or broadloom carpet shall be appropriate to the function of areas and shall comply to the latest *Pekeliling Perbendaharaan Malaysia WP 2.1 - Peraturan dan Had Harga Perabot/Kelengkapan Bagi Pejabat Anggota-Anggota Perkhidmatan Awam Persekutuan* (*Termasuk Anggota Polis Diraja Malaysia*).

b) Carpet shall be provided to areas needed as per functional requirements.

c) Carpet is not encouraged to be used in the Clinical Area. If required, the type of carpet shall be hygienic and subject to the PD's concurrence.

d) Carpets shall be of good quality, wear and stain-resistant, and easy to clean. Use low VOC carpet.

e) All ground floor areas, which are specified using carpets, shall have approved damp-proof floor slabs. All carpets shall be laid with the underlay, and the wall edge shall be with approved 100 mm height timber skirting.

f) Aluminium dividing strips or other suitable rust-proof metal gripper strips shall be laid at junctions of different floor finishes and finishing flushed with flooring.

g) Carpets used shall be laid with close butt joints with the underlay, stretched and balanced so that all seams are parallel with minimum bows with suitable rust-proof metal gripper strips securely installed. The carpets shall be installed in the largest practical pieces, and salvage shall be trimmed as required to assure colour uniformity and pattern match at seams. All carpet shall have its edges trimmed and neatly fitted around all perimeters, openings, and obstructions.

h) The successful tenderer shall be required to submit samples of the various colours/patterns to the PD's concurrence.

5.4 WALL AND PARTITION

a) The type of non-structural walling system shall be constructed according to their intended purposes. The performance of the wall shall comply with the requirements and proper function of the space.

b) All non-structural wall systems construction shall comply with the design requirements for strength, serviceability, stability, performance, and durability as specified in the latest JKR Standard Specification for Building Works.

c) Cavity wall or double wall shall be provided for 24 hours air-conditioned areas.

d) The autoclaved aerated concrete (AAC) blocks wall with compatible plaster thickness shall be as follows:

   i. Internal wall (general area): minimum 125 mm thick.

   ii. Internal wall (clinical area): minimum 150 mm thick.

   iii. Internal wall at 24 hours air-conditioned room: minimum 150 mm thick for both sides of walls with minimum 25 mm gap (infill with

PUR/PIR insulation) in between the walls or 200 mm thick of wall subjected to PD's concurrence.

iv. Party wall: 200 mm thick., shall be classified of Class O building material in accordance with BS 476 Part 4 (non-combustible) or Part 6 & 7 (limited combustible), or at least has an A2 rating in accordance with EN 13501 Part 1.

v. Auditorium wall: minimum 200 mm thick.

5.4.1 External Wall

a) External wall finishes shall be weather resistant anti-fungus and shall be of good quality, requiring minimal maintenance with good aesthetic quality and environmentally friendly. Materials and finishes used for the buildings' external wall shall be easily maintained, non-porous, durable, and fungus free.

b) Prefabricated panels

Prefabricated panels shall be of the pre-cast concrete panel. When used, large prefabricated panels shall conform to MS 1313 Code of Practice on Large Prefabricated Panels.

c) Clay Bricks

Where applicable, shall conform to MS 76. Other types of bricks used shall be in accordance with the PD's approval. All brick walls shall have GI expanded/exmet mesh reinforcement with 750 mm x 5 mm diameter brickwork dowel bar complete with 75 mm right-angle bent to hook onto brickwork at every 4^{th} course. All brick walls shall not have less than 20 mm thick cement plaster on both sides unless otherwise specified. Cement sand bricks shall not be accepted.

d) Structural Wall (Blockwork System)

The full requirements for blockwork system are outlined in Specification for Structural Wall Blockwork System under Clause 4, Section E: Wall System (JKR 20800-0226-20) or the latest edition published by JKR. The followings shall apply to the construction of all load bearing blockworks with or without steel reinforcement:

i. Material

The block shall comply with the requirements of MS 2282 Part 3.

ii. Compressive Strength

For all block units intended to be used in elements subject to structural requirements, the mean compressive strength shall not be less than 7N/mm^2. The manufacturer shall also declare the normalised compressive strength when relevant.

iii. Density

The net dry density of the units shall be declared in kilogram per cubic meters (kg/m^3) by the manufacturer in accordance with MS 1933 Part 13. The minimum dry density of unit shall not be less than 1500kg/m^3.

Other requirements such as mortar and its' testing, concrete infill, blocklaying, block masonry bonds and services holes/chases shall be referred to Clause 4, Section E: Wall System of the latest edition of JKR Standard Specifications for Building Works.

e) The IBS wall system shall strictly follow the manufacturer's specifications, installation methods, and the JKR Building Standards and Specifications.

5.4.2 Internal Wall

a) Generally, internal walls shall conform to the complete IBS system following the functional requirements unless otherwise stated. The IBS wall system shall follow strictly to the manufacturer's specifications and methods of installation.

b) Generally, internal walls shall consist of prefabricated panels, drywall partitions, or blocks. The coordination of mechanical and electrical services shall be given due consideration at an early stage.

c) Prefabricated panels shall be of the pre-cast concrete panel, lightweight concrete panel, glass panel, timber panel, or composite panel.

d) Pre-cast concrete surface shall be plaster or skim coated and finished with paint.

e) All toilets, ablution, and wet areas shall be of brickwork. If the tenderer proposes other material, the tenderer should submit the following requirements to the PD's concurrence:

i. A report consisting of a method statement and guarantees letter from the material supplier with the specification details, material performance verifying such material is suitable for toilets and wet areas, and a testing report from an accredited lab.

ii. Undertaking letters from professional consultants verifying such material is suitable to be used in toilets and wet areas.

iii. A site visit to another building using the same proposed material.

iv. A report on the performance of the material used in other buildings.

f) All toilet walls, pantry, and wet areas shall be finished with glazed ceramic tiles up to the ceiling, complete with uPVC tile-trims and/or other accessories wherever required.

g) Catering department kitchen and cafeteria kitchen shall be finished with glazed ceramic tiles up to the ceiling, complete with uPVC tile-trims and other accessories.

h) The ablution areas shall have wall tiles up to 1200 mm in height for wall protection.

i) Glazed ceramic tiles or suitable materials to match the worktop shall be provided as a backsplash behind worktops, wash hand basins, and sinks. The length of the backsplash shall cover the overall module of the low and overhead cabinet. The height of the backsplash shall be up to:

i. Bottom of overhead cabinets
ii. Ceiling

j) Public areas such as the main lobby or entrance/foyer, waiting area, main lobby lifts, main staircase, and other adjacent areas shall be of easy maintenance materials and integrated with the overall interior design concept.

k) All mechanical and electrical service rooms wall shall be constructed of brick. If the tenderer proposes other material, the tenderer should submit the following requirements to the PD's concurrence as per item e.

l) For operating theatres and all other clean areas, the walls shall be seamless. All the joints' angular parts shall be curved and plastered with special approved non-porous plaster and painted for easy cleaning and maintenance.

m) Walls for operating theatres equipped with radiation and X-ray equipment shall have a minimum thickness of 2.0 mm lead equivalence of radiation protection and in compliance with related standards/guidelines and obtained approval by *Bahagian Kawalselia Radiasi Perubatan*, MOH.

For example: If application of brickwork with 25 mm thick barium plaster of approved composition for radiation and in compliance with the relevant authorities' requirements applied, the wall shall be painted.

n) For X-ray rooms with X-ray equipment up to 150 kV and radiotherapy treatment rooms or other areas as required, the walls shall have a minimum thickness of 2.0 mm lead equivalence of radiation protection and in compliance with related standards/guidelines and obtained approval by *Bahagian Kawalselia Radiasi Perubatan*, MOH.

o) For radiotherapy rooms or areas, which have special radiotherapy equipment, special walls made of thicker reinforced concrete shall be designed in compliance with related standards/guidelines and obtained approval by *Bahagian Kawalselia Radiasi Perubatan*, MOH.

5.4.3 Drywall Partition

a) When used, the drywall partition system shall be strong and stable enough to support built-in furniture and any other fittings or equipment necessary for the building's space effective functioning.

b) Drywall shall be thermal and sound insulated for the proper functioning of space.

c) Drywall partition shall be supplied and installed by a drywall specialist. The drywall system's construction shall strictly adhere to the manufacturers' method statement of the installation process.

d) Drywall system utilising cement-fibre board, gypsum board, anodised aluminum alloy, epoxy-coated steel or stainless steel wall panels, mounted on a galvanised steel framework.

e) The wall panels shall be painted unless otherwise stated, and the joints well sealed before painting. The drywall shall be fabricated with the coordination of mechanical and electrical services at an early design stage.

f) When used, large prefabricated panels shall conform to MS 1313:1993 Code of Practice on Large Prefabricated Panels.

g) The drywalls shall be well insulated to maintain the indoor temperatures while preventing condensation problems on the outside wall surfaces and for sound insulation purposes.

h) In a location where drywalls adjoin wet areas, adequate waterproofing shall be applied to the surfaces up to a specified height according to the manufacturer's specification.

i) The drywall system shall comply with all fire requirements and the other requirements under the UBBL.

j) Drywall partitions shall be provided for non-clinical areas only.

5.5 COMPARTMENT WALL

5.5.1 All compartment walls shall comply with the JBPM's fire requirements and adhere to the UBBL. All openings in a compartment wall shall be fitted with fire-rated doors and shall comply with the UBBL. The fire-rated doors shall be installed with the Détente system for any patient movement area, and according to the Client's requirement and the PD's concurrence.

5.6 CEILING

General

5.6.1 Ceiling specification shall comply with the fire spread classification as stipulated in the 8th Schedule of UBBL 1984.

5.6.2 Ceiling boards shall be asbestos-free.

5.6.3 The suspended grid ceiling system shall be of the proprietary system. The construction shall comply with the design requirements for strength, serviceability, stability, performance, and durability as specified in the latest JKR Standard Specification for Building Works.

5.6.4 Ceilings of the operating theatres' department, CSSD, and other sterile areas shall be seamless with alcove edge (for OT Room only), a minimum of 12.5 mm thickness, moisture-resistant and fire-resistant gypsum plasterboards of approved quality. All lighting, air-conditioning, fire protection, and other service outlets shall be integrated design and flushed with plaster ceiling.

5.6.5 All plaster ceiling joints shall be sealed with tapes and trowel finished with gypsum plaster to the manufacturer's recommendation. The finished

surface shall be painted with an aseptic type of paint, washable and high-performance hygienic coatings where required.

5.6.6 All wet or humid clinical areas in 24 hours AC rooms (e.g., laboratories and pharmacy) shall use PVC laminated gypsum boards, and not less than 12.5 mm thick with the size of 600 mm x 600 mm integrated with moisture-resistant gypsum plaster ceiling border, concealed metal bars, rod hangers, clips and fixing accessories.

5.6.7 All internal corridors in the hospital and other areas shall be finished with patterned gypsum boards of 600 mm x 600 mm and integrated with the plaster ceiling border.

5.6.8 All toilets ceiling shall be of moisture-resistant material of a minimum size, 600 mm x 600 mm x 9 mm (thickness) PVC laminated ceiling boards complete with approved metal bars, rod hangers, clips, and fixing accessories.

5.6.9 All external overhang roofs shall be covered with an approved fixed ceiling system designed to integrate with the building facade.

Ceiling Specification (Suspended System)

5.6.10 All ceilings unless otherwise specified shall use gypsum panels and not less than 12.5 mm thick high-performance of size 600 mm x 600 mm, 100 kg/m^3 density powder-coated aluminum T-bars, metal rod hangers fixed at not more than 1200 mm intervals, clips, and fixing accessories with bonded warranty with gypsum plaster ceiling border.

5.6.11 Special decorative ceiling or ceiling panels of approved materials shall be provided to areas such as the main entrance lobby and adjacent areas, VIP lounges, conference/meeting room, etc., and integrated with all other interior design requirements (i.e., special lightings or M&E fittings).

5.6.12 All plaster ceiling joints shall be sealed with tape and trowelled finished gypsum plaster to the manufacturer’s recommendation. The finished surface shall be painted with anti-bacterial/washable paint to satisfy that space's design requirements.

5.6.13 Design and installation of the ceiling suspension system and frame shall be structurally sound with minimum maintenance. Hanger rods shall not be hooked, hanged, or fastened at any ducting or service piping inside the ceiling plenum. Ancillary services such as electrical cables and air-conditioning ductworks shall not be suspended from the ceiling hangers.

5.6.14 The manufacturers of suspended ceiling systems must submit calculations and shop drawings showing compliance to all design requirements certified by Professional Engineer (PE) and the PD for approval prior to acceptance.

5.6.15 The contractor shall carry out in-situ Pull-Out Tests, specified in the latest JKR Standard Specification for Building Works.

5.6.16 Adequate air plenum space above the suspended ceiling shall accommodate all service conduits, ducting, and piping for maintenance access. Under no circumstances shall these services intrude into the areas of the room beneath.

5.6.17 All ceilings for 24 hours air-conditioned rooms shall comply with the design requirement as stipulated in the latest JKR Guidelines on The Prevention of Mould Growth in Buildings by *Cawangan Kejuruteraan Mekanikal*, JKR.

5.6.18 Rooms with no ceiling access shall have maintenance access via adjacent room/corridor by means of catwalks. Plaster ceilings shall be designed to incorporate maintenance access.

Ceiling Specification (Fixed System)

5.6.19 All external ceilings for soffits, porches, and link ways shall be of fixed ceiling system (e.g., aluminum strip ceiling system) with approved ceiling finish. All materials used shall be from weather and damp resistant materials. No suspended ceiling system shall be used at outdoor and semi-outdoor areas (e.g., external corridor, open lobbies, etc.).

5.6.20 Unless otherwise specified, ceiling boards shall be fixed to the frames with butt `V' joint using nails or screws as specified. Asbestos-free cement flat sheets for ceiling shall be 5 mm thick fixed to frames using mitered timber cover battens. Ceiling panels shall be set out symmetrically from the center line of the ceiling. The external ceiling shall be painted with weather-resistant paint.

5.6.21 All external soffits, porches, and link-ways shall be covered with a fixed ceiling system complete with accessories.

5.6.22 All exposed soffit of the slab above or below beam shall be skim coated to the PD's concurrence.

5.7 WINDOW

5.7.1 Casement windows shall not obstruct or encroach into any circulation area when open.

5.7.2 Adjustable glass louver windows shall be used wherever it is required. When used, the adjustable louvers shall conform to MS 1057: Specification for Adjustable Louvre Windows. Glass louvre blades shall not be less than 6 mm thick.

5.7.3 Where rooms require privacy without curtains such as dental consultation and examination room, call centre, changing room, etc., obscured glass or tinted glass shall be used. It shall fit the room purpose without compromising the patients' comfort level with consideration of optimum thermal comfort and daylight harvesting.

5.7.4 Where applicable, tinted glass ratio of Light-to-Solar Gain (LSG) shall comply with the Building Energy Efficiency Technical Guideline for Passive Design and adhered to MS 1525:2014 as follows:

a) Visible Light Transmission (VLT) not less than 30% and,
b) OOTV not more than 50 W/m^2.

5.7.5 All windows and openings shall be recessed or shielded by eaves or canopies and shall be considered as a shading device.

5.7.6 Anodised aluminum curtain and/or blind tracks shall be provided to all windows, as required.

5.7.7 Partitions, window frames, and other aluminium components used shall be fabricated from aluminium alloy B6063-T5, complying with the requirements of MS 832 with the parts made up of extruded and pressed sections.

5.7.8 Security grilles, as required, shall integrate with the window frame and comply with fire regulations. Contractor is to submit proof of fire-resistant test following BS 476 or other approved equivalent standard as mentioned in the latest JKR Standard Specification for Building Works.

5.7.9 All toilet windows, unless otherwise stated, shall be top hung window fixed with translucent glass.

5.7.10 Anti-bandit glass and wired glass for windows, doors, and panels shall be used at appropriate locations, where required (i.e., for safety and security requirements). They shall be clear/transparent wired glass with square 12 mm mesh fabricated from steel wire, electrically welded at each intersection.

5.7.11 Aluminium windows glazing accessories and components shall conform to MS 832.

5.7.12 The windows and shading devices design shall be weatherproof, form an integral system that prevents glare, promotes the transmission of daylight

deep into the building, and satisfies user requirements for glare protection, view, and direct control daylight transmission into the room.

5.7.13 Window design shall ensure the lux level complies with the latest MS 1525: 2019 Code of Practice on Energy Efficiency and Use of Renewable Energy for Non-Residential Buildings for the internal room function and spaces compromising the view to external surrounding.

5.7.14 Vertical or roller blinds complete with all accessories shall be robust, high quality, and easily maintained. Blinds shall be provided for administrative areas, meeting rooms, and other appropriate air-conditioned areas, as required unless otherwise specified.

5.7.15 Any uPVC window frames are specified; all joints shall be welded entirely into a single piece for a seamless smooth finish.

5.7.16 All hospital windows shall be lockable unless otherwise specified. All top hung and casement windows shall include window opening restrictors with a maximum of 30° opening. The windows' design shall consider safety and security issues.

5.7.17 A double-glazed window shall be provided for 24 hours of air-conditioned areas to avoid condensation.

5.7.18 All windows situated on the ground floor, basement, split level floor, and any other locations easily accessible from outside shall be provided with security grilles. If the residential block design is susceptible to a security breach, security grilles shall be provided for all main entrance doors. All residential blocks' windows shall be provided with security grilles that can be secured without a padlock and easily opened in a fire emergency. Security grilles shall be designed integrated with the window frame and in compliance with fire requirements.

5.7.19 All windows shall have proper closing and tightness to prevent water and air leakages.

5.7.20 All windows and glass panels shall be framed with aluminium comsash alloy of powder-coated aluminium.

5.7.21 Lead glass panels in Radiology Clinical and treatment area (if any) shall have protection at a minimum thickness of 2.0 mm lead equivalence, against X-ray rated at 150 kV. All framing around glass panels shall be properly constructed to seal off X-rays with a proper lining of 2 mm thick lead/ Pb equivalent.

5.7.22 Low-level louver window design shall allow maximum cross ventilation at all ward areas and non-air-conditioned areas.

5.7.23 Operating Theatres if located at the building's perimeter, the external windows shall be provided with double glazing panels to avoid condensation.

5.7.24 External glass for external walls and windows shall be of low shading coefficient and low emissivity.

5.7.25 Insect net screen shall be provided complete with aluminium framing and mounted to openings/windows in non-air-conditioning areas for habitable rooms. The screens shall be securely clipped and fixed to the openings/windows and demountable for easy cleaning and maintenance.

Internal Glass Panel

5.7.26 One-way glass panels shall be designed at selected rooms as identified by the Client.

5.7.27 The internal glass panel with adjustable vertical blind between the glass panel gaps shall be provided in between ICU bays or other areas/rooms identified by the Client or otherwise specified.

5.7.28 Full height internal glass shall be installed at 150 mm from finish floor level, complete with wall and glass protection.

5.7.29 All glass panel between the air-conditioned and non-air-conditioned area shall be constructed double glazed to reduce/eliminate the risk of condensation.

5.8 DOOR

5.8.1 All doors shall comply with the latest JKR Standard Specification for Building Works.

5.8.2 Unless otherwise specified, all doors shall be of hollow-core or honeycomb timber construction with 40 mm minimum thickness.

5.8.3 External doors shall be protected from weather elements. The doors shall be recessed inwards or shielded by eaves or canopies. The door finishes shall be manufactured with Moisture Resistant (MR) Bond and Weather and Boil Proof (WBP) bond, respectively, in compliance with MS 228.

5.8.4 All external doors shall be finished with weatherproof paint.

5.8.5 Doors at VIP rooms, auditoriums, conference rooms, meeting rooms, and all main entrances shall be of solid timber or solid core construction with a minimum of 40 mm thickness. They shall conform to the latest MS 1506 and wooden door frames conforming to the latest MS 1508.

5.8.6 Doors shall not obstruct or encroach into any circulation or movement of equipment/panel/furniture. When open 180° or full swing of door leaf opening are essentially considered unless it constrains the limitation of space approved and the PD's concurrence. The door swing shall comply with the fire regulations.

5.8.7 Single leaf door width shall not be less than 900 mm clear opening, and double leaf door width shall not be less than 1500 mm clear opening to ease movement for humans, wheelchairs, and equipments. Single leaf door width for service duct shall not be less than 600 mm clear of opening. The door height shall not be less than 2100 mm clear of opening.

5.8.8 In areas where the doors are liable to water splashing (e.g., cubicle toilet doors, wet utility rooms, etc.), the doors shall be a minimum thickness of 12 mm water-resistant phenolic resin boards with a proprietary anti-rust fixing system according to manufacturer's instructions. The frames to such doors shall be lifted with 150 mm high concrete heel (i.e., stones for protection against rusting/rotting due to wetness). PVC doors are strictly not acceptable.

5.8.9 Approved door seals or sweeps shall be provided underneath doors between air-conditioned and non-air-conditioned areas, where applicable.

5.8.10 Composite aluminium louvered doors shall be provided for utility rooms, plant rooms, and all other rooms requiring natural ventilation or fresh air change cycle. For sensitive equipment/instrument rooms, anti-vermin netting shall be fixed and fastened inside the louvered door panels. Sizing shall be appropriate, and netting colour shall blend with the overall scheme to the PD's concurrence.

5.8.11 Aluminium frame sliding glass door, when used, shall conform with MS 1017.

5.8.12 Access card system-controlled door shall be provided wherever it is specified/required. The location and position of the system shall not jeopardize the architectural aesthetic. (Refer to Electrical Works Brief).

5.8.13 Non-corrosive roller shutter doors/grilles shall be motorised with manual override of approving and durable type. Roller shutter doors/grilles shall be provided at areas such as the central refuse chamber, services rooms, and other applicable areas.

5.8.14 Certain areas such as Dispensing Counter Area, Kitchen, Medical Store, or other areas where required shall be provided with approved durable motorised non-corrosive roller shutters with opening devices. Where ventilation or visual surveillance is needed, perforated roller shutters shall be used. All roller shutters shall have a side door.

5.8.15 All fire-rated doors and frames shall be constructed with the relevant FRP following MS 1073 and Ninth Schedule of the UBBL. They shall be tested by a laboratory, approved and certified by DGFS, and have obtained a Product Certification Scheme from an accredited certification body.

5.8.16 All fire-rated doors and frames must be obtained from a manufacturer-approved by the inspectorate of the fire department and installed strictly following the manufacturer's specification.

5.8.17 Fire-rated doors at locations where hold-open door closers are not allowed by fire regulations shall be provided with magnetic hold-open devices (i.e., public and patients' corridors).

5.8.18 All compartmentalised areas where fire doors are required shall be provided with magnetic hold-open devices. A flush or glazed door shall also be provided as the second or entrance door.

5.8.19 All doors that are installed on the ground floor, basement, split level floor, and any other locations easily accessible from outside shall be provided with security grilles. Suppose the residential block design is susceptible to a security breach; in that case, security grilles shall be provided for all main entrance doors of the hostel and every residential quarter's unit on all floors. Security grilles shall be designed integrated with the door frame and in compliance with the fire requirements.

5.8.20 Semi or fully glazed sliding automatic doors with electronically-controlled if specified shall be with manual override and shall be provided with side doors for all main entrances. All semi or fully glazed sliding doors, whether automatic or not, shall have adequate space for the doors to slide open unobstructed and safely.

5.8.21 The switches for semi or fully glazed sliding doors shall be placed at easy access without any obstruction when the doors slide open.

5.8.22 Installation of the airtight system such as revolving or double-layer doors shall be considered, especially in the high traffic areas.

5.8.23 All semi or fully glazed doors shall be disabled-friendly and marked prominently with safety indicators (i.e., design, colours, stripe, etc.) at the level between 800 mm to 1500 mm, measured from the finished floor level.

5.8.24 2 mm lead equivalent/ Pb equivalent doors shall be provided for X-ray rooms with equipment rated at 150 kV and radiotherapy rooms or other areas as specified (approval by *Bahagian Kawalselia Radiasi Perubatan*, MOH). All lead-lined doors shall be provided with door frame lined with a single lead sheet and door handle on both sides.

5.8.25 12 mm thick tempered and frameless fully glazed doors shall be provided for all main entrances to various departments and wards, with 200 mm x 200 mm I-section mild steel proscenium to be painted, comes with a suitable handle, and shall be approved by the PD.

5.8.26 All doors must open fully and have an open-hold function at clinical areas and heavy traffic movement routes.

5.8.27 Airtight doors shall be provided at pressure-controlled rooms where hygiene and the control of air leakage is critical. All airtight doors shall be able to maintain the pressure differential between the inside and outside area, preventing the exchange of the external and internal air code for a sterile environment (i.e., the operating theatres, surgical areas, disinfecting rooms, clean rooms, etc.) The door shall be of compliant and fully certified for healthcare facilities.

5.9 TOILETS AND WET AREAS

5.9.1 All public toilets with two or more water closets shall have an anteroom/airlock before entering the toilet to avoid the unwanted smell and hygienic reasons. Doors with louvers are not allowed at any toilet entrance and airlocks.

5.9.2 Design, dimension, requirements, and specifications of all toilets, including PwD toilets, shower rooms, or bathrooms, shall comply with the MS 1184: Universal Design and Accessibility in Built Environment – Code of Practice.

5.9.3 Toilets for the disabled shall be located at strategic, accessible, and non-isolated areas.

5.9.4 The width of toilet cubicles shall not be less than 1200 mm clear width.

5.9.5 Toilets shall have a maximum number of windows for good ventilation and daylight and conform to UBBL or other equivalent Act of the Government's Authority.

5.9.6 Toilets shall be designed with water savings flush valve system. The valve shall be concealed and can be easily accessed and maintained.

5.9.7 If required, toilets with a cistern system shall be concealed, easily accessed, maintained, and installed according to the manufacturer's instructions.

5.9.8 Toilets and showers in public/staff areas shall be compartmentalised with cubicles. The cubicles' sidewalls shall be brickwork, but the cubicle doors and front walls shall be constructed with an approved proprietary system using water-resistant phenolic resin boards. The minimum thickness of the boards shall be 12 mm. The gap between the bottom of the toilet cubicle doors and the finished floor level shall be 100 mm.

5.9.9 All showers in the hospital shall be provided with a lever-action handle with hot and cold water mixers. The hot (red) and cold (blue) indicator shall be visible on the mixer handle. The hot water supplied temperature shall be between 38°C to 41°C or the Client's requirement with the PD's concurrence.

5.9.10 All toilet cubicles shall be provided with stainless steel grade 304 top cover tissue roll.

5.9.11 The entrance door to toilets shall be completed with a push and pull plate. Toilet cubical doors shall have hooks with door stopper and fitted with indicator locks, openable from outside in case of emergencies.

5.9.12 All doors with wood or metal frames in wet areas shall be provided with 150 mm high concrete heel stones for protection against rusting/rotting due to wetness.

5.9.13 Patient toilet doors shall open outward for easy removal of the door via their surface bolted or pivoted hinges in the event of a patient inside the toilet collapse or faints and falls against the door.

5.9.14 Patient toilets and showers located at the wards, clinical areas as well as all other toilets meant for the disabled, shall be provided with shower seat, soft- closed WC cover, stainless steel three bars towel rails, corner basket, and appropriate nylon coated or other approved material grab bars on the walls. For Mother and Children's Toilet's requirement, foldable nappy change and adaptor must be provided.

5.9.15 All cleaner's or janitor's rooms shall be provided with a stainless steel open shelf with mop hangers, anti-insect stainless steel floor trap, and a stainless steel grade 304 single bowl 'hopper' sink complete with tap fittings for washing and discarding of dirty water.

5.10 SANITARY FITTINGS AND FIXTURES

5.10.1 All sanitary fittings and fixtures shall comply with the latest JKR Standard Specification for Building Works.

5.10.2 All sanitary fittings shall be supplied from one approved authorised dealer/manufacturer and shall be securely and properly installed to walls and/or floors, complete with connection to waste, vents, and services required.

5.10.3 All fittings shall be of the minimum stainless steel grade 304 unless otherwise specified and to the PD's concurrence.

5.10.4 All sanitary fittings shall be water-efficient with Water Efficient Product Labelling Scheme (WEPLS) certification and comply with the Water Services Industry Act 2006 and Water Services Industry (Water Reticulation and Plumbing) Rules 2014. The successful tenderer shall have to submit performance certificates by suppliers for low flow sanitary fixtures.

5.10.5 Where required, rainwater shall be harvested for toilet flushing, general washing, or landscape irrigation. Internal water reticulation and plumbing system shall be designed accordingly with a back-up portable water supply.

5.10.6 The plumbing and sanitary installation shall be tested entirely after installation to the PD's satisfaction. Prior notice shall be given to the parties concerned before testing.

5.10.7 A Schedule of Sanitary Fittings & Fixtures shall be drawn up as part of the proposal.

Clinical Requirement

5.10.8 All clinical wash hand basins shall be 850 mm from the finished floor level to the bowl's front top rim.

5.10.9 Clinical wash hand basins shall be wall hung vitreous type and not less than 600 mm in width. Clinical wash hand basins shall not have any overflow outlet, soap recess, nor basin plug.

5.10.10 Each clinical wash hand basin shall be provided with a wall-mounted clinical mixer. The mixer shall have a minimum 175 mm long elbow action lever complete with pre-set/pre-mix function and stainless steel p-trap for hot water system. The hot water supplied temperature shall be between 38°C to 41°C or to the client requirement with the PD's concurrence. Adequate dynamic pressure and flow shall be provided as required by the mechanical engineer's need to ensure the mixer's operation functions correctly. A

minimum of ten (10) years warranty from the date of CPC is required from the manufacturer.

5.10.11 Clinical wash hand basin complete with 100 mm high backsplash and 6 mm thick frameless beveled edge mirrors (450 mm x 600 mm) shall be provided at each patient bay and other clinical areas. The backsplash shall be high-pressure laminated phenolic board with a minimum size (800 mm x 1700 mm x 10 mm thick) to accommodate soap dispensers. The backsplash shall be installed with a minimum of 300 mm height from the finished floor level.

5.10.12 All basins with hot and cold water for the clinical area shall have stainless steel P-traps unless otherwise specified.

5.10.13 Stainless steel scrub-up troughs shall be provided in Operation Theatres Department and all other clinical areas where deemed necessary. The scrub-up troughs shall be installed complete with a minimum of 550 mm high backsplash, lever handle/knee operated taps and foot-operated soap dispensers, bevel edges standing height mirror, brush dispensers, and brush-collection basket. The tenderer shall prepare a mock-up to determine the actual dimension between tap outlets and finish floor level to the PD's concurrence before installation.

5.10.14 All countertops/worktops with integral sinks shall be 15 mm thick impermeable, monolithic, and chemical resistant solid surface moulded with 100 mm bullnose backsplash. The backsplash must be properly sealed at the joints with the wall to prevent water seepage. The size of the backsplash shall be the full length of the countertop.

5.10.15 Unless otherwise described plaster traps of the stainless steel with minimum grade 304 shall be provided for the sinks at the Plaster Room or any other clinical areas involving plastering works to avoid blockage of drainage pipes. The design shall comply with *Garis Panduan Konsep Rekabentuk Dan Pemasangan Dental Wax dan Plaster Trap Di Makmal Pergigian* by the MOH. Shop drawings shall be submitted for the PD's approval.

5.10.16 A suitable type of hangers for lead gowns shall be fixed securely to the wall in the radiology area, imaging area, and as to where required.

5.10.17 Water Closets (WC)

a) Wall hung, pedestal, and squatting types of WC shall be made of vitreous china.

b) The top of the toilet seat shall be optimized at 460 mm from the finished floor level and comply with MS 1184: 2014 Universal Design and

Accessibility in Built Environment – Code of Practice. The successful tenderer shall provide mock-ups for the PD's concurrence before installation.

c) Each of the WC shall be provided with chrome-plated fittings such as adjustable control bidet/nozzle spray at 1.2 meters long and fixed on the right side of the wall, complete with stainless steel grade 304 top cover tissue roll holder, heavy-duty seamless, flexible hose with wall hook fittings and a toilet holder.

d) All squatting WC shall have an integral footrest and a water seal trap, if required.

e) Except for the siphonic system, all other flushing cisterns shall be designed in such a way to give dual flushes with a nominal volume of a full and partial flush not exceeding 6 and 3 litres, respectively, following the Water Services Industry Act 2006.

f) The concealed cisterns shall be installed per the manufacturer's mounting instructions and other relevant recommendations. A ten (10) years warranty from the manufacturer shall be provided for all the concealed cisterns, and the warranty period shall start from the date of handing over.

g) An easily accessible service opening shall be provided for WC using the flush valve system. A service room with a minimum clear width of 900 mm shall be provided to allow for easy access during maintenance of the pipes.

h) No urinals shall be installed.

i) Wherever WC for the children's convenience is required, the standard WC shall be used and shall be installed slightly lower than the standard WC. For paediatric WC, it shall be supplied with an adaptor.

5.10.18 Wash Hand Basin

a) All wash hand basins and countertops (excluding clinical wash hand basins, laboratory sinks, stainless steel sinks, and scrub-up troughs) shall be provided with appropriately sized mirrors, which shall be fixed flush to the walls.

b) Countertops made of an approved solid surface shall have both integral, wash hand basins and 100 mm high backsplash or shall have under-counter vitreous china wash hand basins.

c) All wash hand basins (not including clinical wash hand basins, laboratory sinks, stainless steel sinks, and scrub-up troughs) shall be made of 15 mm thick solid surface acrylic resin with an appropriate elevated concealed support system, complete with full-width bevel edged mirror to match the length of the vanity countertops and mounted on the wall tiles. The wash hand basins shall be integral with the countertop complete with molded 100 mm high backsplash and minimum 150 mm fascia piece.

d) Taps fixed from the walls shall be encouraged to prevent mould growth. If specified, pillar taps shall be properly sealed at the base to prevent water from leaking into the countertop.

e) All wash hand basins for general use shall be 850 mm in height measured from the finished floor level to the bowl's top rim. The successful tenderer shall provide mock-ups for the PD's concurrence before installation.

f) All wash hand basins and countertops shall be fixed at a height between 750 mm to 850 mm measured from finished floor level to the top rim of the bowl with knee clearance for wheelchair access of 650 mm to 700 mm high and 200 mm deep following MS 1184: 2014 Universal Design and Accessibility in Built Environment – Code of Practice.

g) All wash hand basins and sinks shall have bottle traps and/or other approved alternatives to prevent unwanted smell and maintenance purposes.

h) All public toilets shall be provided with children wash hand basin with countertop at acceptable children's height between 700 mm to 780 mm measured from finished floor level to the top rim of the bowl, deep following MS 1184: 2014 Universal Design and Accessibility in Built Environment – Code of Practice.

i) Wash hand basins for toilets shall be provided with cold water supply only unless otherwise specified.

j) Wash hand basins and/or sinks for laboratories, clinical areas, and patient toilets shall be provided with hot and cold water supply with lever-action mixer taps.

5.10.19 Other Fittings

a) An adequate number of coat/robe hooks shall be provided to showers, toilets, changing rooms, and other areas as required. Coat/robe hooks

for showers and toilets in the wards shall be located next to the shower rose or water closet to facilitate patients with drips.

b) All ablution areas in the Prayer Rooms shall be provided with ablution/bib taps, complete with 175 mm elbow action quarter-turn lever, with swivel/fixed spout. The ablution area drainage shall have adequate floor traps inside and outside to prevent clogging. Appropriate stainless steel shelves or ledges shall be provided at the ablution areas, at a suitable height, not to cause injury to the user. Allow one space for a wheelchair user and a built-in ablution stool to be provided when necessary/where applicable.

c) All mechanical plant rooms shall be provided with tap fittings, complete with floor traps. All requirements shall comply with Mechanical requirements.

d) Outdoor areas such as near refuse bin facilities, car wash area, garage, and landscaped areas shall be provided with special lock-head taps at appropriate locations and placed at not more than 30 meters intervals for gardening purposes. A standpipe shall be provided at the garage.

e) Floor traps shall be anti-insect stainless steel grade 304 type to prevent cockroach egress from waste pipes. When required, the floor trap cover shall be screw type/allen key/SS cable or other anti-vandal type and heavy-duty as approved by the PD.

f) Breastfeeding and nappy changing rooms shall be provided with countertops, sinks complete with washing facilities, and an adequate number of power point outlets for breastfeeding pumps. The breastfeeding and nappy changing rooms must be separated for the mother's privacy.

g) PVC tap shall be avoided.

h) Other fittings deemed necessary shall be installed in accordance with the manufacturer's recommendation as approved by the PD.

5.11 IRONMONGERIES

5.11.1 All ironmongeries work shall comply with the latest JKR Standard Specification for Building Works.

5.11.2 All doors, windows, gates, joinery, etc., shall be provided with anti-rust heavy-duty ironmongery appropriate for its function, complete with fixing screws of the same material and finish.

5.11.3 All door sets, door closers, floor springs, and other door hardware accessories except otherwise specified, including fire-rated doors and doors' grille, shall be supplied by one manufacturer. If various manufacturers are used, the successful tenderer shall coordinate to ensure uniformity.

5.11.4 The submission of the ironmongeries set shall have been tested and certified by SIRIM or approved equivalent.

5.11.5 All ironmongeries and accessories installed shall have a warranty during the Defects Liability Period. Defects in materials and mechanical failure due to manufacturing shall be corrected or replaced to the PD's satisfaction.

5.11.6 All hardware shall be as specified in the door sets. Special consideration shall be taken to coordinate the finish of the various manufacturers to ensure uniformity.

5.11.7 Considerations shall be taken in provisions of view panels, closer, and hold-open facilities, usage of obscure and clear glass, locks, push and pull facilities, etc., required to be used at appropriate locations.

5.11.8 Doors of rooms where required high-security system shall be of electro-magnetic locking type or approved equivalent. The access control system shall be of modular system and adaptable for any applications, i.e., magnetic card reader or keypad system (details as per Electrical Works Brief). The location and height must be appropriately positioned and uniform so as not to jeopardise the architectural aesthetic.

5.11.9 Lock and Lockset

a) All ironmongeries shall comply with SIRIM or any International Standard such as ANSI/EN as specified below:

   i. For lever handle and knob to comply with BS EN1906: 2010 (minimum cycle 200,000 test report) or ANSI Grade 3.

   ii. For mechanically operated locks, latches, and locking plates to comply with BS EN12209-2003 (minimum cycle 200,000 test report).

   iii. For cylinder locks and the master key to comply with BS EN1303 (minimum cycle 100,000 test report).

   iv. Door closing devices to comply with BS EN1154 (minimum cycle 400,000 test report).

v. Automatic sliding or automatic swing door mechanism shall comply with EN 16005/60335 (minimum cycle 1,000,000 test report).

vi. Controlled door closing devices test report to comply with BS EN1154 or other recognised standards.

vii. The successful tenderer may also submit test reports that conform to ISO 9001 and ISO 143001.

b) All doors shall be provided with stainless steel mortice lever lockset system of a minimum of 16-pin integrated active pins (all springs) or a minimum of 11-disc mechanical system, complete with a door closer, a door stopper, and other required accessories to the PD's concurrence.

c) For residential and other non-clinical ancillary buildings, single internal doors (except toilet cubicle doors and sliding doors) shall be provided with stainless steel, brass, or bronze cylindrical lockset (6-pin) unless otherwise specified, complete with lever handle, door closer, door stopper, and other required accessories to the PD's concurrence.

d) For rooms that require constant lock (i.e., filing room, record room, stores), an automatic deadlocking lockset is required and must escape from inside with a single-action opening.

e) Panic exit device shall be used at all final/fire exit doors and as required by the fire regulations.

f) Locks shall be provided to doors and shall be master keyed suited/key-alike in each building, including fire door, sliding door, padlocks, and others required.

g) All locks, including fire door lockset, shall be furnished with construction keyed, differ keyed, master keyed, grand master keyed, under the same system; patterned keyway or restricted keyway profiles shall be used to enhance better security. All keys should be made from high-quality brass or nickel silver alloy.

h) All locks shall be furnished complete with at least three (3) keys. The number of different keys, master keys, and grand master keys shall be provided with construction keys. All keys shall be high-quality brass and nickel silver alloy.

i) A master key system shall be provided and approved by client and complied to CGSO requirement.

j) All differ, master, grand master keys are to be sealed, labelled, and handed to the Client upon completing the project in a properly organised manner to the PD's satisfaction and concurrence.

k) All lock strike plates shall be supplied with a box and shall have a lip of enough length to protect the door trim and jamb. Mortise backset shall be not less than 55 mm (single throw) and 60 mm (double throw).

l) Tubular knob handles shall not be acceptable for fire doors.

5.11.10 Hinges

All hinges supplied shall be from the same manufacturer and comply with the latest JKR Standard Specification for Building Work. Unless otherwise specified, stainless steel grade 304 butt weld hinges of not less than three (3) hinges per door leaf shall be provided, depending on the door weight and width.

5.11.11 Door Closers and Door Stoppers

a) Door closers and door stoppers shall be of the approved locally manufactured type and shall be properly installed and fastened where they shall not obstruct any equipment, furniture and/or services.

b) All doors shall be fitted with aluminium alloy door closers except toilet cubicle doors and sliding doors, and shall have a hold-open function except for fire doors.

c) Door closer elements such as spring/power setting, back-check, sweep speed, and latch speed valve shall be adjustable.

d) Toilet cubicle doors shall be fitted with one (1) stainless steel hook.

e) When the operating force needed to open the door is greater than 25 N for PWD toilet doors, an automatic opening door is required. Preferably automatic doors or controlled door closing devices with a hold-open device. An alternative option is using dual-powered-controlled door locking devices with electro-magnetic retention for higher power spring.

f) All door closers shall have two pressure relief valves to prevent oil leakage and damage to the back-check valve. It must be completely reversible, have a back feature, and have a warranty of less than five (5) years from the manufacturer.

g) The minimum size of closer must comply with EN 1154 (500,000 testings), or any accredited recognised international standard size 3 to 5 depending on the door weight and width and shall have five (5) years warranty. The door closers can hold up more than 100 kg door.

h) For areas involving special interiors such as the auditorium, Royal Ward, VIP Room, and other specified areas, the door closer shall come with a sliding arm with two pressure relief valves, including latching speed and closing speed for better function and aesthetics.

i) Toilet cubicle doors shall be fitted with indicator locks.

5.11.12 **Floor spring**

a) All floor springs shall be provided with a pressure relief valve to prevent overloading and oil leakage. The floor spring shall be supplied with an adjustable hold-open function and a five (5) years warranty.
b) Heavy-duty floor spring shall be incorporated with a hold-open function, and a minimum door weight of 120 kg should be allowed.

c) Stainless steel of minimum grade 304 floor spring cover plates shall be installed correctly to avoid/reduce dust collection in the cement case and mounting.

5.11.13 The successful tenderer shall provide customised computer-generated schedules with the following information:

a) Consolidated break down of hardware sets.

b) Consolidated door schedule by the floor and by building.

c) Consolidated door hardware sets by items.

d) Consolidated door schedule with master key reference.

e) Consolidated door schedule with grand master key reference.

f) Consolidated door schedule with great grand master key reference.

g) Consolidated door schedule with key alike

h) Door type, fire door, and timber flush door.

i) Any other schedule that may be needed and requested by the PD.

5.11.14 The successful tenderer shall provide for all packing hardware individually in boxes/plastic bags, labeled adequately with door number, hardware sets, master keying reference, location of doors, and strike plate template. Key cabinets shall be provided.

5.11.15 All exit fire doors shall use Electro Magnetic Locks (EML) with break glass or electromechanical locks with key override under the Building Monitoring System (BMS).

5.11.16 Consideration shall be given to provide fire rated doors with panic exit device, magnetic hold-open device, push and pull handles in appropriate areas.

5.11.17 The entrance door to toilets shall be completed with a push and pull plate, with a minimum of three (3) hooks.

5.11.18 Sliding door for disable or clinical area must be mechanical sliding soft closing track system with rear side break including back check function, allowing the door to close and open easily without damaging the vertical frame. Door opening power 1.14 to 1.61 kg for weight 60 kg door to 80 kg door. Power spring drive can be adjusted for slower or faster speed. For the mechanism, manual override shall be incorporated with the master keying system.

5.11.19 Special types of ironmongery, including all the accessories, shall be used for all lead-lined doors to prevent radiation leakage. The door closer for this door can hold up to 120 kg.

5.11.20 All main entrances and exit doors to residential units, quarters/hostel (if any), including nurse bedrooms, shall be provided with lever handle, deadlock with bolt and key.

5.11.21 Approved kick plates and push plates shall be provided to all doors involving patient and trolley movement except fully glazed doors and cubicle toilet doors, unless otherwise specified. Decorative kick plate and push plate shall be considered as part of the overall interior design concept.

5.11.22 Approved anti-bacterial nylon or equivalent lever, pull and push handles shall be provided for all doors, where specified due to clinical function (e.g., isolation room, laboratory, paediatric department, specialist clinics, royal wards, areas involve VIP’s, etc.).

5.11.23 The building design shall be integrated with an adequate security system. For emergency exits, an electrically controlled locking device shall be provided. The bidder shall provide doorbells and intercom with door release buttons or keypad locking systems to control admittance to various departments and accommodation.

5.11.24 All door accessories such as door stopper, kick plates, hat and coat hooks, flush pull rings, pull handles, stainless steel flush bolts, and door coordinator shall be made of stainless steel 304 grade or otherwise stated. Warranty for not less than ten (10) years as an addition to the general warranty provided by the successful tenderer and the sample of material shall be submitted for the PD's concurrence.

5.11.25 The tenderers shall draw up a schedule of ironmongeries, as part of the proposal in **Appendix 4 – Schedule of Ironmongeries.**

5.12 ACOUSTIC WORKS

5.12.1 The successful tenderer shall provide acoustic treatment to the auditorium, lecture rooms, meeting rooms, and other required areas to properly function and fit for its purpose, as specified in the project requirements.

5.12.2 Consideration to provide acoustical treatment shall be given to all spaces adjacent to mechanical and electrical equipment rooms or spaces.

5.12.3 The successful tenderer shall appoint an Acoustic Specialist to carry out the acoustic design works for the required spaces.

5.12.4 Samples of all the acoustic materials proposed colour schemes together with detailed drawings and performance calculation data endorsed by an acoustic specialist shall be presented for the PD's concurrence before installation.

5.12.5 Measurement of the indoor ambient noise levels at the noisiest facade shall be taken. The results shall be in accordance with BS EN ISO 140-4, and the acoustic performance shall be rated following BS EN ISO 717-1.

5.12.6 Measurements shall be taken during the external noise levels that are representative of conditions during normal operation hours.

5.13 PAINT WORKS

5.13.1 All painting works shall comply with the latest JKR Standard Specification for Building Works.

5.13.2 All paints used shall be those supplied by approved manufacturers and to the PD's concurrence.

5.13.3 All painting works and warranty given shall comply with the specifications specified in the latest JKR Standard Specification for Building Works.

5.13.4 Generally, paints and stains with low VOC content will be used and shall be of the required quality and standard obtained from local manufacturers and of the PD's concurrence.

5.13.5 Before painting works, the wall panel surface shall be completely dry, free from dust, dirt, etc. Painting to other surfaces and works shall conform to the latest JKR's General Specifications for Building Works' minimum standards.

5.13.6 Silicone-based water repellents paint where specified shall conform to BS 3826 Class A.

5.13.7 All metal surfaces shall be powder coated unless otherwise stated. All metal surfaces other than powder coated or anodised shall be, coated with one undercoat anti-rust and finished with two coats of approved gloss enamel paint and to the manufacturer's specification.

5.13.8 Finishes for timber shall be lime-washed, stained, or painted with approved gloss paint wherever appropriate.

5.13.9 Exposed timber shall be primed with primers conforming to MS 132: UDC 667.649 Specification for Undercoating Paint for Use Under Gloss Enamel Paint, applied with 2 coats of approved stain, and coated with flat varnish.

5.13.10 All external walls shall be painted with weather-resistant and anti-fungus properties. The contractor may also propose other types of external wall finishes, fungus-free and require minimum maintenance. The external walls painting proposal shall be enclosed with a performance warranty for a minimum of ten (10) years.

5.13.11 All internal walls, excluding clinical departments, shall be painted with washable paint type. Heavy circulation areas, including corridors, shall be painted with paints that are easily washable and maintainable.

5.13.12 All walls for 24 hours air-conditioned rooms shall be painted with PU or epoxy paint as stipulated in the latest JKR's Guidelines on The Prevention of Mould Growth in Buildings.

5.13.13 Storage areas wall shall be painted with washable emulsion paint to the manufacturer's specifications and the PD's concurrence.

5.13.14 All non-clinical walls to public and semi-public areas such as corridors, sub waiting areas, and waiting lounge shall be finished with approved washable emulsion paints with low VOC content and shall be to the PD's concurrence.

5.13.15 All walls in the clinical work areas and sterile areas such as laboratories, treatment rooms, CSSD, OT area, clean utility rooms, etc., shall be painted with approved epoxy paint or polyurethane paints with low VOC content and shall be to the PD's concurrence.

5.13.16 CSSD and other sterile areas that specify painting works shall be painted with approved low VOC content and shall be to the PD's concurrence.

5.13.17 The minimum requirement for all areas shall be as follow:

a) All clinical including wards and sterile departments shall be painted with epoxy paints.

b) All administrative, corridor, and public areas at non-clinical areas shall be painted with washable paint.

c) All stores unless otherwise specified and M&E services rooms shall be painted with emulsion paint.

CHECKLIST OF WALL PAINT

NO.	AREAS/ROOMS	TYPE OF PAINT		
		Weather resistant & anti-fungus	PU/ Epoxy paint	Washable paint
1	**External wall**	√		
2	**Internal wall:** **24 hours areas/room** Example of related departments/ rooms: a) A&E Department b) OT Department c) In-Patient Department d) Pharmacy store e) Others as stated in MBOR or technically required		√	

NO.	AREAS/ROOMS	TYPE OF PAINT		
		Weather resistant & anti-fungus	PU/ Epoxy paint	Washable paint
3	**Internal wall :** **Clinical & sterile areas/room** Example of related areas/ rooms: a) CSSD Department b) Laboratories c) Wards d) CE rooms e) Treatment Room f) Procedure Room g) Clean Utility h) Others as stated in MBOR or technically required		√	
4	**Internal wall :** **Non-clinical areas/room** Example of related areas/ rooms: a) Areas/rooms in Office hours Department: • Administration Department • Offices • Training facilities: • Seminar, meeting rooms etc. • Waiting areas • Corridor • Public areas b) Others as stated in MBOR or technical required			√
5	**Internal wall :** **Services** a) Store b) M&E rooms			√

5.13.18 All colour scheme proposals must be submitted to the Client for approval and shall be forwarded to the PD's concurrence before application on-site.

5.13.19 The successful tenderer shall submit three (3) options of external and internal colour schemes comprising a minimum of two (2) elevations (for external) and complete with sample boards for the PD's approval.

5.14 WATERPROOFING

5.14.1 All waterproofing works shall comply with the latest JKR Standard Specification for Building Works.

5.14.2 Reinforced concrete flat roofs and gutters, where applicable, shall use any approved waterproofing.

5.14.3 Wet area floors such as toilets, bathrooms, kitchen, ablution, and pantry, where applicable, shall use any of the following types of waterproofing:

a) Cementitious
b) Crystallisation

5.14.4 Waterproofing for toilet walls, bathrooms, ablution, and wet areas shall extend to 2100 mm to prevent dampness.

5.14.5 Damp proof course and/or waterproofing membranes shall be provided to retaining walls, basements, and all ground floor areas, especially with finishes such as vinyl, parquet, timber strip, and carpet. The damp proof course shall be provided with an approved waterproofing proprietary system.

5.14.6 Waterproofing membrane, wherever used, shall be turned up at the curbs, parapets and turned into a sealing chase. Membrane collars and sleeves shall be provided and properly sealed at pipes and conduit areas, per approved waterproofing proprietary system.

5.14.7 Waterproofing membrane, wherever specified, shall reflect and emit heat from the surface and also prevent fungus growth.

5.14.8 All external planter boxes, wherever specified, shall be applied with approved waterproofing complete with concealed proper drainage outlet into the nearest perimeter drain.

5.15 STAIRCASES AND RAILINGS

5.15.1 All external exposed staircases and corridors shall be protected from weather elements to remain dry and not be slippery. All exposed staircases and corridors must have adequate rainwater splashing protection.

5.15.2 All fire escape or emergency staircases shall be finished with non-slip nosing tiles.

5.15.3 All public staircases floor shall be finished with non-slip tiles and non-slip nosing tiles.

5.15.4 Public staircases, especially at the main entrance lobby, both railings and balustrades must be of special design and finished to the PD's concurrence.

5.15.5 Railings for the corridors and balconies shall be designed 1200 mm in height for safety, ergonomics, and pleasing aesthetics. The safety rail design shall be disabled friendly with no obstruction on both sides of the walkway.

5.15.6 Railings of staircases, corridors, and balconies shall be securely fixed to the floor with a minimum of 150 mm upstand finished curb. The railings shall be of galvanised mild steel, painted with gloss enamel paint unless otherwise specified.

5.15.7 All open balconies, corridors, and staircases shall have a proper scupper drain, outlet, and downpipe for water discharge. Spout pipe is not allowed in any areas.

5.15.8 Clinical areas shall avoid downpipes.

5.15.9 Railings and balconies design shall consider safety and security aspects and shall comply with the JBPM requirement.

5.16 OTHER ACCESSORIES

5.16.1 Columns, Walls and Door Protection

a) Column and wall corners along high traffic routes shall be protected with an approved high impact vinyl/acrylic extrusion corner guard protection system.

b) Buffer rails shall be provided for loading areas. It shall be surface mounted and made of high impact vinyl or acrylic extrusion complete with guard gaskets, aluminium-fixing clips, and rubber gaskets.

c) Wall protection (e.g., wall guard and crash rail) shall be provided along main patient trolley routes or wheelchair routes, food distribution routes, in the ancillary accommodation, or other areas as specified where trolleys or pellets are used.

d) All walls, columns, and door protection fittings shall be of approved material supported off the wall surface at the agreed level. It shall preferably consist of either high impact vinyl or acrylic extrusions complete with guards, continuous gaskets, aluminum retainers, and mounting brackets. The distance between wall and rail shall conform to MS 1184 or the latest edition.

e) All wall protections shall be designed and integrated with handrails in public areas. Only locally manufactured products shall be used, and the successful tenderer shall provide the shop drawing that indicates all of the protection system, samples, and brochures of various colours and patterns for the PD's concurrence before the commencement of work.

   i. Trolley park - crash rail 2 layers – 900 mm and 250 mm off the floor (wall guard and crash rail).

   ii. Trolley route - crash rail 1 layer – 900 mm off the floor.

   iii. Patient route - grab rail cum with wall protection.

   iv. Corner/sharp edges - corner guard.

   v. Industrial bumper guard - loading/unloading

5.16.2 Cubicle Curtain, Intravenous (IV) Track and Vertical Blind Wall

a) Generally, all cubicle curtain tracks shall be suspended from the soffit slab and subject to the PD's concurrence.

b) IV track shall be suspended from the soffit slab and shall be applied where required.

c) All cubicle curtain tracks shall be anodised aluminum alloy to the PD's concurrence and shall be rigidly fixed and suspended types. Under no circumstances shall the cubicle curtain tracks be fixed off the suspended ceiling T-bars nor ceiling boards.

d) Black-out curtains shall be provided in Dark Rooms and other rooms where required.

e) Vertical blinds shall be provided (windows external & internal glass panel) for non-medical areas such as administrative areas, training areas, conference, seminar, meeting rooms, and other appropriate areas.

f) Curtain track shall be supplied for all windows unless otherwise specified.

g) Medical cubicle track position shall not clash with built-in cabinet or lay on loose furniture (i.e., low cabinet) and to avoid window frame.

5.16.3 A schedule of other accessories shall be drawn up and submitted as part of the proposal and subject to material approval by JKR and the client, with PD's concurrence.

SECTION 6.0: INTERIOR WORKS FURNISHING AND OTHER FITTINGS

6.1 INTERIOR WORKS AND DESIGN

6.1.1 General Principles

a) The successful tenderer shall appoint a registered interior design consultant with knowledge, skill, and experience both technically and aesthetically to execute the building's interior design.

b) Any interior architectural element or material chosen shall consider a healthy environment that can be easily maintained. The use and exploitation of all specific and prominent cues of the building's interior architectural elements shall be maximised. Simple interior functional parts like appropriate lighting and colours for the wall and floor will provide aesthetics and capture the atmosphere desired for each space. Interior decoration works shall integrate with the operational and functional requirements, as well as energy performance.

c) Interior works shall be coordinated with M&E services. The successful tenderer shall comply with all scopes of the interior works as specified.

d) The specified areas' interior works shall consist of relevant concepts in providing aesthetics and capturing the atmosphere desired for the individual space intended.

e) The successful tenderer shall allow work special design pattern and workmanship at the floor/wall finished to suit Interior Design Concept.

f) Interior design material shall comply with fire requirements and the UBBL.

6.1.2 Interior Design (ID) Concept and Scopes

The tenderer shall submit the ID concept proposal for the respective areas of the interior works. The ID shall provide a conducive, comfortable, and user-friendly work surrounding. Also, interior decoration works shall integrate operational and functional requirements in the design.

a) Design Concept

The interior will play an essential part in making the hospital complex a friendlier and welcoming place to visit and a more comfortable place to stay. The tenderers shall submit the interior design concept proposal focusing on using natural lights, calming sound, and colours to imitate the surroundings. The interior design concept shall have an appropriate theme that creates a conducive and cheerful environment to help patients recover.

b) Unifying Elements

The use of columns, being the most prominent architectural element internally, will be used concurrently with the floor pattern to be the unifying element throughout the interior design.

c) Colours

Suitable colours shall be chosen for large public spaces such as the cafeterias, lobbies, and foyers to psychologically give the illusion of spaciousness, creating a healing and cheerful environment.

Areas such as private rooms shall be given more subdued earth tones and pastel colours to promote tranquillity and homeliness where people can converse and rest while relaxing towards recovery.

d) Design Scopes

Detailed drawings for the interior design works shall be provided for the whole building. The works shall also include execution, supervision, and completion of the areas with particular emphasis on the following areas:

i. Main entrance lobby and all other entrance lobbies department.
ii. Executive Floors (i.e., Director, Head of Department, etc.).
iii. Reception, Registration Area, Receiving Counters, and Waiting Area.
iv. Seminar, Conference, and Meeting Rooms.
v. Lounge Area
vi. Auditorium
vii. Royal Wards/VVIP Wards/VIP Wards/First Class Wards (the whole floor involving patients and public).
viii. The areas involved paediatric (e.g., Paediatric Departments, Wards, Paediatric Clinic, Children Play Area, etc.).
ix. All Nurse base/counter
x. Lift Lobby Interior

6.2 FURNITURE WORKS

6.2.1 General Requirement (for Built-in Furniture, Loose Furniture, and Healthcare Laboratory Furniture)

These furniture requirements are for design, construction, completion, installation of loose furniture, built-in furniture, and soft furnishing for all new buildings in the project. The requirements given shall be indicative and non-exhaustive, and the successful tenderer may include suggestions and/or improvements:

a) All built-in and loose furniture shall be in adequate numbers as interacted for the rooms' proper functioning and the Government's satisfaction.

b) Furniture requirements shall be provided following the government guidelines and circulars.

c) Proposed furniture design shall be coordinated and integrated with the whole ID works and overall design concept.

d) Proposed furniture design and quality shall be to the PD's concurrence.

e) The dimensions given in the specification are indicative and of minimum sizes. The successful tenderer shall take measurements on site before fabrication to ensure the modules can be installed appropriately.

f) Samples of all furniture items, materials, fabrics, and accessories shall be submitted for the PD's concurrence before supply and installation.

g) Mock-up furniture showing design, colour schemes, and samples fixed on sample boards, fittings, and other items shall be submitted for the PD's concurrence.

h) When necessary, the successful tenderer shall arrange factory/ showroom visits to see the furniture's production and selection.

i) A documented inventory schedule for all loose and built-in furniture shall be submitted prior to handing over the project.

j) The proposed furniture system shall be available locally and to the PD's concurrence.

k) Composite wood and other fibre products used shall not contain urea-formaldehyde and moisture-resistant.

6.2.2 Built-In Furniture

The successful tenderer shall submit a detailed Schedule of Built-in Furniture (**Appendix 6 – Schedule of Built-in Furniture**) complete with quantity for each room shall be drawn up as part of the proposal in the form of all room layouts with elevations on all sides.

a) The successful tenderer shall provide a detailed design indicating the length, breadth, height, and materials used for the built-in furniture and list the quantity of the items proposed for each space.

b) All built-in furniture specifications shall comply with the JKR Standard Specifications for Building Works.

c) The design of furniture and counters shall consider the accommodation of IT, M&E, and other relevant services. All walls and full-height cabinets shall be designed to a minimum height of 2100 mm unless otherwise stated. Also, they shall be designed to ensure no unusable gap between walls/fittings, etc.

d) All counters shall be designed and integrated with ID works, including ceiling, lighting, and backdrop signage.

e) All offices and residential units shall be furnished with built-in furniture and fittings, including complete sets of cubicle workstations for open-plan office, which shall be of a quality acceptable by the Government and follow the EPU Guideline and MOF Circular.

f) All shelves support fittings shall be of an approved quality suitable for the performance of the shelves.

g) The glass used shall be a clear float glass of 6 mm thickness from a local manufacturer and must be the slot-in clear float glass type.

h) Built-in furniture shall include counters, worktop with under bench cabinets with or without drawers, high-level cabinets and open shelves, tall cabinets and open racks, open shelves, pigeonholes, wardrobes, lockers, crossover benches with shoe racks underneath, and sitting benches.

i) All stainless steel furniture shall be anti-rust and a minimum grade of SS 304. For the sterile area, stainless steel furniture shall be a minimum of grade SS 316.

j) All front/reception counters located at the main lobby, departmental counters including Nurse Counters/Stations, waiting areas, and others (where applicable) shall be seamless solid surface worktops.

k) For areas involving VIP/VVIP/Royal Ward, innovative design is required for all counters, and the worktops shall be seamless with higher specification materials such as granite, marble/equivalent.

l) Standing and sitting counter to be provided where applicable to suit the function of the room.

m) All countertops and worktops without any sink shall be a minimum of 18 mm moisture-resistant post-formed particleboard laminated with 0.7

mm thick High-Pressure Laminate (HPL) with 100 mm high backsplash and bull-nosed edging.

n) All countertops with sink shall be of solid surface finish, with integrally moulded sink and 100 mm high backsplash. The solid surface shall be non-porous, non-toxic, hypoallergenic, and to provide a hygienic worktop surface. The solid surface top should be easy to clean and a continuous work surface that should be free from visible dirt, dust, and abrasions. All stainless steel worktops shall have a minimum of 400 mm backsplash.

o) The successful tenderer shall furnish detailed designs indicating the length, breadth, height, and materials used for the built-in furniture and list the quantity of the items proposed for each space.

p) Built-in furniture shall be constructed in approved modular of various depths as follow (unless otherwise stated):

i.	Countertops	750 mm
ii.	Worktops	600 mm and/750mm
iii.	Under bench cabinets	550 mm
iv.	Wall cabinets	300 mm
v.	High cabinets	300 mm/450 mm
vi.	Tall cabinets and open racks	300, 450, 600 mm
vii.	Wardrobe	450 mm/600 mm
viii.	Lockers	450 mm
ix.	Combi Board/Notice Board	Varies

q) The built-in with integrated M&E fittings and fixtures shall be provided, such as meeting table, back panels, etc.

r) The hospital's built-in furniture such as cupboards, shelves, lockers, worktops, and countertops shall be supported with a stainless steel support leg. The cupboards, shelves, etc., are raised off the floor by a minimum of 200 mm for easy cleaning and maintenance.

s) Cabinets under the worktop shall be detached from the worktop to cater for future redistribution of cabinets with the worktop not being damaged in any way.

t) For floor finishes (i.e., vinyl and tiles), all under bench cabinets that touch the floor shall be 'U' capped with stainless steel shoes up to 150 mm high. Under bench at carpeted areas shall be built on the finished floor level.

u) All under-bench cabinets, high-level cabinets, tall cabinets, and racks, wardrobes, and lockers shall be constructed of:

i. 18 mm thick post-formed moisture-resistant particleboard laminated with 0.7 mm thick HPL complete with 2 mm thick ABS edging for all cabinet doors, drawer fronts, top and underside panels, and side panels.

ii. 18 mm thick particleboard laminated with 0.7 mm thick HPL and 2 mm thick ABS edging for the carcass, shelves of pigeon holes, tall cabinets, and racks all around.

iii. 12 mm thick melamine board with 0.5 mm thick PVC edging for drawer sides and back.

iv. 4 mm thick polyester for cabinet and wardrobe back panels and drawer base.

v. All cabinets' width shall follow the modular dimension of 300 mm, 450 mm, 600 mm, and 900 mm.

vi. All cabinets shall have adequate and durable support, depending on the type of system used.

v) Hardware for all built-in furniture shall be as listed but not limited as follows:

i. Drawer runner - side-mounted metal drawer with soft closing mechanism and load-bearing capacity of 15 kg. The drawer must be supported by powder-coated metal/steel structure or bracing.

ii. Hinges – stainless steel soft closing hinges with 105º to 110º degree opening and zero cranking with adjustment for the cabinet's door panel.

iii. Sliding rail - Drawer telescopic slides components are required.

iv. Shelf support – Aluminium with stainless steel studs.

v. Hanger rod – 20 mm diameter chrome-plated steel tubular clothes hanger.

vi. Cylinder lock – a minimum of 50% of total cabinets in every room shall be lockable.

vii. Flexible plastic cabinet door lips to avoid gaps between door panel.

viii. Furniture silicone rubber pad at all steel legs.

ix. Glass at cabinet's door shall be slot-in type.

w) Hardware for all built-in furniture of post-formed moisture-resistant particleboard laminated with HPL with doors/drawers shall be designed handle-free. The design must take into account for easy maintenance, wear-resistant, and ergonometric purposes.

x) Adequate numbers of ventilated built-in lockers shall be provided in all the staff changing rooms and patients' changing rooms, as required by the Government.

y) All clinical wet and sterile areas shall be provided with the approved quality of stainless steel racks, worktops, and cabinets.

z) All stores, equipment rooms, and medical record rooms shall be provided with approved quality heavy-duty racking.

aa) Metal compactor cabinets with steering wheels shall be provided at Medical Record Room, Central Registration, or otherwise stated. The track shall be embedded with the floor.

6.2.3 Loose Furniture

The successful tenderer shall submit a detailed schedule of loose furniture drawn up and submitted as part of the proposal, as shown in **Appendix 8 – Schedule of Loose Furniture.**

a) All fit-outs and loose furniture shall be supplied and installed in all relevant areas.

   i. Office spaces shall be furnished with furniture and workstation to the PD's concurrence.

   ii. Head of department's room, officer's room and other required rooms shall be completely furnished and in compliance with the latest EPU Guidelines and *Pekeliling Perbendaharaan Malaysia WP 2.1 – Peraturan dan Had Harga Perabot/ Kelengkapan Bagi Pejabat Anggota-Anggota Perkhidmatan Awam Persekutuan* (*Termasuk Anggota Polis Diraja Malaysia*).

   iii. The successful tenderer shall provide documentation complete with a list of indicative furniture design proposals with pictures, catalogues, and specifications on the length, breadth, height, and materials used and the quantities of the items proposed for each room.

   iv. All loose furniture shall be read in conjunction with the Project Brief and Government Requirements for Medical Equipment, Non-Medical Equipment, Loose Furniture, and Vehicles.

v. All loose furniture shall be easily maintained and subject to technical specification adherence (TSA), interaction, and the Client's approval.

6.2.4 Healthcare Laboratory Furniture

The successful tenderer shall submit a detailed schedule of healthcare laboratory furniture drawn up and submitted as part of the proposal, as shown in **Appendix 7 – Schedule of Healthcare Laboratory Furniture.**

a) The design and layout of the healthcare laboratory furniture shall conform to the requirements of the Client.

b) Shop drawings of laboratory furniture shall be submitted to the PD and Client for approval before installation.

c) Laboratory Furniture (e.g., Chemical Lab, Stat Lab, etc.) shall be fully furnished with all furniture and fittings of adequate quantity and acceptable quality to the PD's concurrence. Wherever required, Lab Furniture layout shall be coordinated with Emergency Eye Wash and Emergency Shower location/ position complete with floor traps.

d) Laboratory furniture in the chemical lab shall have a chemical-resistant worktop such as phenolic resin, epoxy solid cast/oven-baked, or equivalent to the PD's concurrence. The laboratory waste pipe fittings shall be of chemical-resistant black polypropylene complete with anti-siphonic bottle trap and dilution recovery traps.

e) The healthcare laboratory bench system shall be fully furnished with all furniture and fittings of adequate quantity and acceptable quality to the PD's concurrence.

f) The healthcare laboratory bench system shall generally be well incorporated with mechanical and electrical services to accommodate laboratory works' requirements by means of benchtop service modules and under bench service compartments.

g) The five main components in the system consist of:
   i. Worktop
   ii. Sink
   iii. Casework
   iv. Fittings and accessories
   v. Waste pipe and dilution traps.

h) Supplier shall provide the warranty certificate/letter from the manufacturer for the listed items:

i. Worktop
ii. Water Faucet
iii. Emergency Shower
iv. PP sanitary fittings

6.2.4.1 Laboratory Bench Worktop

a) Solid cast/oven-baked epoxy worktops shall be a monolithic, filled epoxy resin product. They shall consist of a polymerized cast resin material formulated to provide a work surface with high chemical resistance characteristics.

b) For a long-lasting lifetime usage, a ceramic worktop is to be used at the sink area. The ceramic that undergoes the glazing process is highly resistant to chemicals and stains. Thickness shall be not less than 20 mm.

c) The system's worktop shall be made from epoxy resin; this includes the worktop in the fume hood working area.

d) The worktop shall not be less than 20 mm thick, comes with a drip groove at the exposed ends, and have a continuous drip groove.

e) Any side attached to the wall/column must come with a 100 mm high backsplash of the same thickness as the worktop.

f) All joints must be leveled between 2 pieces and sealed with epoxy cement of the same brand.

g) All exposed edges shall be chamfered, and all corners shall be rounded (1/2 inch radius).

h) Sample of worktop jointing (inclusive of 100 mm high backsplash) must be presented to the Client, implementing agency, and Architect during tender interview and interaction.

i) Epoxy worktop must come with a lifetime warranty against manufacturing defects for discoloring and breakage.

j) Solid Epoxy Worktop shall have minimum properties as follows:

PROPERTY	TEST METHOD (ASTM)	RESULT (METRIC)
Compressive Strength	D695-10	136.5 MPa
Flexural Strength	D790-10	55.1 MPa
Rockwell M Hardness	D785-08	90

Water Absorption	D570-98	0.022%
Heat Distortion	D648-07	115°C
Density	D792-00	1.95 g/cm3
Flexural Modulus	D790-10	16205 MPa
Fire Resistance	D635-06	No Flaming

k) Solid Epoxy Worktop shall fulfill requirement ASTM/SIRIM and shall have minimum resistance to the following chemicals:

Acetic Acid 98%	Iso-octane
Acetic Acid	Glacial Kerosene
Acetone	Methyl Alcohol
Ammonium Hydroxide 28%	Mineral Oil
Aniline Oil	Nitric Acid 70%
Benzene	Nitric Acid 10%
Carbon Tetrachloride	Oleic Acid
Chromic Acid 40%	Olive Oil
Citric Acid 10%	Phenol
Cottonseed Oil	Soap Solution 1%
Dichromate Cleaning Solution	Sodium Carbonate 20%
Diethyl Ether	Sodium Carbonate 2%
Dimethyl Formamide	Sodium Chloride 10%
Distilled Water	Sodium Hydroxide 40%
Detergent solution ¼%	Sodium Hydroxide 10%
Ethyl Acetate	Sodium Hypochlorite 5%
Ethyl Alcohol 95%	Sulphuric Acid 10%
Ethyl Alcohol 50%	Sulphuric Acid 60%
Ethylene Dichloric Acid	Sulphuric Acid 33%
Heptanes	Toluene
Hydrochloric Acid 37%	Transformer Oil
Hydrochloric Acid 20%	Turpentine
Hydrogen Peroxide 20%	100 Hours soaked cellulose sponge test
Hydrogen Peroxide 3%	Boiling water, trickling, 5 minutes

6.2.4.2 Laboratory Sink

a) Laboratory sinks shall be moulded and integral with the epoxy resin worktops complete with moulded 100 mm high backsplash.

b) Laboratory sinks shall be made from Solid Cast Epoxy or other required materials (e.g., stainless steel, ceramic) with a minimum dimension of 500 mm (L) x 424 mm (W) x 289 mm (D).

c) Sink shall be a drop-in and fixed with epoxy cement.

d) Sink shall support a minimum weight of 60 kg and supplied complete with outlet.

e) If required, marine edge can be applied to the worktop at the sink location to prevent unwanted spills.

f) Sink shall be complete with polypropylene piping and connection to a chemical-resistant black polypropylene anti-siphon bottle trap or dilution recovery trap. The type of waste trap is to be discussed during the interaction.

6.2.4.3 Laboratory Caseworks

a) The cabinet shall comprise of base cabinet, drawer and shelf as follows:
   i. Base cabinet shall be a 0.8 mm thick electro-galvanised steel sheet with a double-layered wall, including top and bottom panel.

   ii. Drawer shall be a 0.8 mm thick electro-galvanised steel sheet with concealed drawer guide and load-bearing capacity of 1.5 kg.

   iii. The drawer and based cabinet below the worktop shall be on a roller track for easy slide and maintenance, where required, such as pathology lab, stat lab, etc.

   iv. Shelf shall be a 0.8 mm thick electro-galvanised steel sheet.

b) Specialists shall locally manufacture all laboratory bench system. The system shall consist of oven-baked epoxy powder-coated electro-galvanised steel frames with shelves and cabinets made of oven-baked epoxy powder-coated electro-galvanised steel sheets.

c) Powder coating shall be from an approved brand with low VOC and anti-microbial properties. The certificate must be presented during submission and interaction.

d) The frame shall be made of a cantilevered system designed of 200 mm off the finished floor level to make under bench cleaning hassle-free and be able to withstand heavy load without compromising safety or otherwise stated.

e) The whole laboratory bench system's height shall be 900 mm high for standing and 750 mm high for seating.

f) The cabinets are to be flush face construction, with doors and drawers in the same plane as the cabinet face frame, without overlap.

g) Materials and thickness shall use the following minimum standard steel thickness for furniture manufacturing:

PARTS	DETAILS
Metal	Electro Galvanized (EG) Steel to provide extra protection against corrosion.
Finishing	Electrostatically applies powder coated with a minimum thickness of 80 microns, semi-gloss finish.
Weight Load	200 kg per maximum leg span of 1.5 meters.
C-Channel	1.5 mm thick EG Steel with 45˚ Bevelled Front.
Leg support	1.6 mm thick RHS EG Steel
Cabinet body	1.2 mm thick EG Steel Sheet
Cabinet front door/drawer	Double-walled construction with sound dampening material in between.
Drawer rail	Powder-coated railing with soft close mechanism and load bearing of 20 kg.
Door hinges	110° wide opening with 2 parts detachable hinges and soft-close mechanism.
Glass viewing window	6 mm thick tempered glass
Castor	Polyurethane medical-grade dual-wheel castor with gear lock.

h) The door hinges and drawer rail must come with a lifetime warranty from the specialist supplier.

i) Service dropper shall be inclusive of 3 compartments to separate the wet and dry M&E services.

j) Reagent rack shall be slot-in type with a fully adjustable height for each shelf. Each shelf should be able to withstand a load of 60 kg.

k) 3 compartments cable management trunking system shall be incorporated with the reagent rack and affix of 300 mm from the worktop surface.

6.2.4.4 Laboratory Fittings and Accessories

a) The laboratory furniture shall come complete with approved proprietary accessories and fittings necessary for the laboratories' proper functioning.

b) All laboratories shall be provided with a cold and hot water outlet, complete with swivel neck nozzles and elbow action lever supplied by an approved local manufacturer.

c) All laboratory fittings for gas outlets shall be of the approved suitable type following BS 1552. The design shall be robust in construction and incorporated with a safety drop lever to prevent accidental 'turn on' of the gas tap.

d) The laboratory waste pipe fittings by mechanical means shall be from an approved manufacturer and in accordance with BS 4991. The mechanical pipe fitting shall be robustly constructed with an injection-moulded component in chemical resistant black polypropylene complete with anti-siphonic bottle trap and dilution chamber.

e) Emergency showers shall be chain operated: floor mounted approved type of system fixed at an approved kind of system set at an appropriate overhead height not less than 2000 mm. The area demarcated shall be laid to fall to stainless steel gratings.

f) All laboratory service fixtures shall be the product of one service fixture manufacturer to assure uniform appearance and ease of maintenance of the laboratory facility.

g) All laboratory service fittings shall be made of solid brass pressings alongside the high-quality brass tube.

h) Undergo state of the art hydrostatic testing at 10 bar (145 psi) to ensure product quality and leakage-free operation.

i) Epoxy powder coated finishing.

j) All fixtures are tested to BS EN 5412:1996, which includes water tightness and pressure resistance.

6.2.4.5 Laboratory Loose Furniture

a) Provision for laboratory loose furniture shall not be part of the contract. The procurement of laboratory loose furniture shall follow the current rules, policies, and procedures of *Pekeliling Perbendaharaan (PP).*

b) All fit-outs and laboratory loose furniture shall be as design proposal and indicative only. Contractor shall indicate it in the Loaded Plans.

c) A detail schedule of laboratory loose furniture shall be drawn up ~~as~~ and submitted as indicative proposal as shown in **Appendix 8 – Schedule of Loose Furniture.**

6.2.5 Design/Performance Specification

All furniture shall be of high quality, finished, and designed with considerations for safety and functionality.

a) The furniture shall be functional in design, rigid, and free from excessive vibration in various layouts and shall have adequate stability against tipping.

b) The furniture proposed shall be standardised while offering opportunities for reflecting the status and importance of different categories of rooms and personnel. All components shall be designed for easy removal and repositioning. Therefore, it is necessary for all parts designed to be interchangeable and reversible.

c) All proposed materials for furniture shall be appropriate for the intended purpose of the item (i.e., the metalwork specified for the filing cabinets) shall be of a suitable thickness to avoid deformation of panels when used for the intended purpose and fully loaded.

d) All components used shall be safe and shall not possess any harmful materials to the environment. The furniture item shall be non-toxic to the indoor environment.

e) All components of the furniture item shall be either non-flammable or shall not support combustion and shall not emit harmful gases in times of danger from fire. Therefore, the suppliers shall provide to the PD a written statement listing all components in either non-flammable or treated-flammable categories. The statement shall also include flammability details of all materials listed in the treated-flammability category in test results from recognised testing authorities with testing certificates.

f) Furniture components, material, and fabrics, containing or during the manufacturing process in which chlorofluorocarbons are used shall not be accepted.

g) The furniture shall be capable of being assembled or reconfigured with a minimum number of tools and minimal time required.

h) Spare components or parts of the furniture shall be readily available in the market locally.

i) Ergonomically and psychological factors must be considered in the overall furniture design.

6.3 ARTWORKS AND CARVING

6.3.1 Wherever required, selections of artworks and carving materials shall be coordinated and compliant with the PD's concurrence.

6.3.2 The selected material for artwork and carving shall suit the required location and position. Specifications, samples, and fixing of the artworks and carving shall be submitted according to the PD's concurrence.

6.3.3 The artworks and carving works shall be coordinated with consideration of all architectural finishes, M&E requirements, and maintenance purposes to the PD's concurrence.

6.3.4 Where it is required, appropriate paintings or posters shall be provided to public and common areas such as the main entrance, lobbies, reception area, waiting lounge, administration office, director's room, and other areas. Choice of paintings and posters shall be to the PD's concurrence.

6.3.5 To have the atmosphere less institutional, the successful tenderer shall provide colourful murals at approved strategic locations if required by the Client.

6.3.6 All interior decoration works shall be well coordinated. Samples of all the materials and colour schemes, and drawings shall be presented to the PD and the Client for their approval before installation.

6.3.7 Artworks and carvings shall be part of the detailed schedule and specification of ID works and shall be drawn up and submitted as part of the proposal.

6.4 SOFT FURNISHING

6.4.1 Soft furnishing works shall include in the design, installation of curtains and/or draperies, vertical/horizontal blinds inclusive of curtain tracks, heavy-duty tracks, and other relevant items (e.g., curtain pelmet) as per requirements.

6.4.2 The selected material for curtains and draperies shall suit the required location and position. The successful tenderer shall submit specifications and samples to the PD's concurrence.

6.4.3 The curtains and draperies shall consider all architectural finishes and M&E requirements.

6.4.4 Blackout curtains shall be provided to specified areas such as the audiovisual room, dark room, or meeting room to the PD's concurrence.

6.4.5 Motorised stage curtains shall be provided in a multi-purpose hall and auditorium with a stage complete with M&E, structural and maintenance requirements.

6.5 SPECIAL FITTINGS AND ACCESSORIES

6.5.1 The selected material for fittings and accessories shall suit the required location and position. The successful tenderer shall submit specifications and samples of the fittings and accessories before fixing and to the PD's concurrence.

6.5.2 The fittings and accessories work shall consider all architectural finishes and M&E requirements.

6.5.3 A detailed schedule of other accessories shall be drawn up and submitted as part of the proposal.

6.6 SIGNAGES AND DIRECTORIES

6.6.1 The successful tenderer shall submit a detailed schedule of internal and external signages shall be drawn up and submitted as part of the proposal, as shown in **Appendix 9 - Schedule of Internal and External Signages.**

a) The code and format for labelling of components shall be as stipulated in the Government's:

   i. Asset Code System (*Sistem Kod Aset Tak Alih* – SKATA), and;
   ii. Asset Data Collection Guidelines (*Garis Panduan Pengumpulan Data Aset Tak Alih* – PeDATA).

b) All labels for the asset components' registration shall comply with the regulatory requirements currently enforced and shall comply with the relevant international and/or Malaysia Standards.

6.6.2 The material for signages and directories shall suit the required function, location, and availability of the local market's material. The successful contractor shall submit the specifications and samples of the signage to the PD's concurrence.

6.6.3 All external buildings' signage and directories shall be of 3 mm thick aluminium panel fabricate for the body and graphic panel spray-painted with silkscreen finish or sticker cut-out. The signage shall be of corrosion-

free and weather proof material, and the size of the signage shall be not less than 2100 mm (height) x 1200 mm (width).

6.6.4 All road signage shall be well-coordinated and following the latest *Arahan Teknik Jalan* (ATJ) by *Cawangan Jalan,* JKR.

6.6.5 The design and selection of internal and external signage shall be well-coordinated with the PD's concurrence.

6.6.6 Signage and directories for the main lobby/ lobbies of a new building and renovated existing building shall be well-coordinated with the overall concept and place at the visitors' eye-level. It shall be designed with high contrast for the visually impaired.

6.6.7 The language used on the signage shall be of the Client's requirements. The Client shall provide detailed information on the buildings and the department's designation.

6.6.8 All fire and M&E signs shall be minimum of 4 mm clear acrylic and spray-painted with silkscreen finish or sticker cut-out. The signages' size shall be not less than 58 mm (height) x 250 mm (width) and shall comply with the JBPM's requirements. All illuminated signs shall be of translucent graphic films and shall also comply with the JBPM's requirements.

6.6.9 All signage and directories shall be provided as required in the proposed scope of works under as follows:

a) Projects main signboard and logo (details are to be provided by the Client).

b) External directional signs to be located at external corridors, parking, walkways and roads, buildings, sectional/blocks, and room names, signs, or titles.

c) Internal directional signs to be located at departmental, internal corridors, lobbies, room names (designations and name-plates), signs to be provided as stated in the room list or SOA.

d) Escape routes and stairways as required by the JBPM.

e) Toilets, utility, and services rooms (e.g., rooms for M&E installation, stores, cleaners, etc.)

6.6.10 All general signages (e.g., toilet signs, ablution, etc.) shall be a minimum of 4 mm clear acrylic and spray-painted with silkscreen finish or sticker cut-out. The suitable sizes of the signage shall be proposed by the tenderer and to the PD's concurrence.

6.6.11 All suspended signages shall be two-sided with a metal frame of 5 mm clear acrylic and spray-painted with silkscreen finish or equivalent. The signages' size shall be not less than 350 mm (height) x 1000 mm (width). Suspended panel signs shall be hung to slab's soffit or other approved structure system using stainless steel rod or cable.

6.6.12 All main internal directories at the lobby area (e.g., diagrammatic plan layout/ mimic diagram of the building) shall be of aluminium modular system and spray-painted with silkscreen finish or sticker cut-out. The signs' size shall not be less than 900 mm (height) x 1445 mm (width).

6.6.13 All internal floor directional signages shall be of a two-sided hanging aluminium modular system and spray-painted with silkscreen finish or equivalent. The signs' size shall be not less than 495 mm (height) x 900 mm (width) with minimum font size of 60mm.

6.6.14 All signages indicating the building's floor levels shall be of 4 mm clear acrylic with reverse silkscreen and mirror-cap. The sign's size shall be not less than 200 mm (height) x 330 mm (width).

6.6.15 The signage proposal shall fulfil the following concepts:

a) User and community-friendly.

b) Enable the public to be familiar with the orientation and directions.

c) Sensitive to the needs of the disabled, including the blind and the deaf, as much as possible.

d) The design of signage shall be integrated and enhance the overall building design.

e) The signages location must reflect the consistency and continuity from the external environment to the internal environment and easy to read.

f) Signages placement shall not be too high. The ideal height of signages may be referred to the JKR Standardised Room Data for Health Facility document as reference, according to the suitability and type of signages to be installed.

6.6.16 Where applicable, the types of signage to be provided shall comprise of but not limited to the following:

a) Main entrance signage and logo including name of hospital, MOH website and crescent logo; the Client shall provide the details with the PD's concurrence.

b) External directional signs to be located on roads, parking areas, and walkways.

c) External statutory signs shall be coordinated with civil drawings.

d) Buildings' label (*Blok, Aras dan Ruang*).

e) Buildings' main directories.

f) Hospital Organization Board and corporate signage at main lobby reception.

g) Internal directional signs at strategic locations.

h) Departmental location signs and sub-location signs.

i) Internal statutory signs (e.g., escape routes).

j) Door signs, i.e., room titles, numbers, designations, and name slots where required (details shall be provided by the Client with the PD's concurrence).

k) M&E signage (shall be coordinated with M&E designs).

l) Portable signage where required.

m) Notices where required.

n) Room codes (as per architectural drawings) to be fixed on the left of the top door frames or other suitable locations where there are no doors.

o) Floor location directories.

p) Lift lobby directories.

q) Floor numbers at lift lobbies and staircases where required.

r) Complex's identification at the site's highest point.

s) Event boards where required.

t) Running digital displays shall be coordinated with M&E designs, where required.

u) JBPM signage requirements (e.g., fire exit, fire alarm, etc.) shall be coordinated with M&E designs.

6.6.17 Pictogram/symbol of international standard and the worded sign shall be provided where required for immediate impact:

a) Cafeteria
b) Lift
c) Staircase
d) Public Phone
e) Male/Female Toilet
f) Disable Toilet
g) Wash & Dry
h) Changing Room
i) Prayer Room
j) Cleaner's Room
k) Breast-Feeding / Nursing / Feeding Room
l) Nappy Change / Baby Changing / Parenting Room
m) Shower
n) Radiation/Radioactive
o) Silence
p) No Handphones
q) No Smoking

6.6.18 Numbering systems and zoning shall be provided for parking lots.

6.6.19 Residential units shall be provided with external directional signs, block numbers, unit door numbers, architectural codes, M&E signage (including JBPM's requirements), and letterbox numbers (if required).

6.6.20 Visual scale shall apply to the signage based on distances, colours used, and font types. Consideration shall be given to legibility and contrast to aid the visually impaired visitors.

6.6.21 Mock-ups of various types of signage shall be submitted for the PD's approval before full installation of the said project.

6.6.22 Numbering Systems shall be provided for various functions as listed below:

a) All patient beds include patient couches where beds with the patients' name-slots shall also be displayed outside the room.

b) All multiple rooms, e.g., Treatment Rooms, Procedure Rooms, C/E Rooms, and X-ray rooms.

c) All wards shall be identified by floor/level and zone, using numbers and alphabets. This identification and its specific name shall appear in the main hospital directory signage in the main lobby, e.g., Wad 3A (*Wad Pediatrik*).

d) All Radiology Rooms and any other clinical rooms with changing cubicles for patients shall have the same continuous numbering system. The attached changing cubicles' signages shall be based on the same number of the Radiology Rooms and alphabets (e.g., 3A and 3B for Radiology Room number 3). The signs for these changing rooms

shall be displayed outside of both doors, including the one leading to the Radiology Room.

e) In the Specialist Clinics, all C/E rooms and related rooms (as stated by the Client) shall be identified with a continuous numbering system. All other supporting rooms accessible to the public shall be identified with the same continuous numbering system, including individual rooms' name.

f) Numbering of the floors shall start with digit 1 (inclusive of the subterranean floor).

g) In the Operation Theatre Department, all OT rooms shall have a continuous numbering system. All doors opening into the OT rooms shall display the same number of the OT rooms. The same number shall also be displayed at the end of the OT's exit corridor. All other supporting rooms shall be identified with the same number of the OT, and it is attached to, together with its room name, e.g., Scrub 2 for scrub room to OT number 2.

h) All rooms accessible to the public, patient cubicles, and bays in the Accident and Emergency Department.

i) Counters such as pharmacy, admission and revenue, registration, and others as identified by the Client.

6.6.23 The Client's Charter with an appropriate design and sizes as agreed by the Client shall be provided for various departments as follows:

Department	Mission and Vision Board	Client's Charter	Workflow Chart
Administration	/	/	/
Specialist Clinics		/	/
Central Registration		/	/
Continuing Medical Education (CME)		/	/
Main Lobby	/	/	/
Admission/Revenue		/	/
Outpatient Pharmacy		/	/
Specialist Office		/	/
Wards		/	/
Imaging and Diagnostic		/	/
All other departments where required by the Client except catering and privatised service		/	/

6.6.24 Contents for the Client's Charter display cabinet shall be furnished by the Client.

6.6.25 Separate cabinets shall be provided for the Client's Charter and Workflow Chart.

6.6.26 The Mission and Vision Board shall be coordinated with the interior design concept.

6.6.27 Materials used for various signages inside the hospital shall complement the building's interior design concept. The successful tenderer shall submit specifications and samples of signages for the PD's concurrence.

6.6.28 The successful tenderer shall propose various colour schemes and graphics for the PD's concurrence and the Client.

SECTION 7.0: LANDSCAPE AND TURFING

7.1 SCOPE OF WORKS

7.1.1 All landscaping and turfing works shall comply with the JKR Standard Specifications for Building Works.

7.1.2 The landscape works for the whole project shall comprise both soft and hard landscaping, including therapy and therapeutic garden in accordance with requirements of the local authority and approval of the government.

7.1.3 Softscape shall comprise of, but not limited to groundcovers, climbers, creepers, shrubs, trees, palms, and turf.

7.1.4 Hardscape shall include, but not limited to outdoor benches and tables, litter bins, planter boxes, garden lights, art sculptures, boulders, pebbles and gravels, water features and gazebo (*wakaf*).

7.1.5 All landscape work shall cover the whole project complex, including open parking areas and roadsides. All open parking shall be planted with shade trees, and palm trees are not allowed in the car park.

7.1.6 The successful tenderer is encouraged to plants shaded trees within building parameters to reduce heat transfer to the building. However, the minimum distance between the perimeter drain to the tree trunk must be according to the guideline set by the Local Authority or *Jabatan Lanskap Negara* (JLN).

7.1.7 Tree planting on pavement area or footpath shall include root barrier for protection from damage as indicated in the JKR Standard Specifications for Building Works.

7.1.8 Appropriate landscape design concepts shall be introduced in areas between building blocks and courtyards. Spaces between buildings shall be landscaped or shaded to function as multi-purpose outdoor areas and minimize heat absorption through the building envelope.

7.1.9 Landscape works shall commence twelve (12) months before the project completion date or as agreed to by the PD so that the trees and plants are well grown and have fully adapted to the environment when the project is handed over upon completion.

7.1.10 The successful tenderer shall set up a temporary nursery within the site to cultivate/grow the said project's plants.

7.2 MATERIALS, WORKMANSHIP AND PLANTING SPECIFICATIONS

7.2.1 Unless otherwise specified, this specification covers supply, planting, and maintenance of all landscaped areas for two (2) years after handing over landscape works. The successful tenderer shall supply all labour, materials, tools, and equipment necessary to complete and maintain the Works.

7.2.2 All landscaping works shall be done and maintained by the successful tenderer specified herein using the best horticultural management, giving special attention to planting practices, soil mixtures, and application of agriculture chemicals.

7.2.3 The PD and/or his authorised representatives shall always have access to the works and nursery or other horticulture sites where work is being prepared for this contract. Delivery of planting materials shall only begin after the PD's approval.

SECTION 8.0: RECREATIONAL FACILITIES

8.1 GENERAL

8.1.1 This section shall be read in conjunction with the Project Brief.

8.1.2 The dimensions and finishes of the game facilities shall comply with the requirements of the *Garis Panduan dan Peraturan bagi Perancangan Bangunan* by *Jawatankuasa Standard dan Kos, Unit Perancang Ekonomi* (EPU), *Jabatan Perdana Menteri*, Malaysia.

8.1.3 All recreational facilities design shall consider safety, security, noise, central location, orientation, vehicle density, and air pollution. The orientation of the outdoor game facilities shall minimize facing the morning and evening sun.

8.1.4 All game court surfaces are to be finished with endorsed and recommended surfacing systems with excellent shock absorption, elasticity, flexibility, strong protective membrane, waterproof, non-toxic, resilience, and slip resistance. All sports facilities and courts shall comply with international standards and be approved by the respective sports council.

8.1.5 Children playground facilities:

Children's indoor and outdoor play structures shall be constructed of sturdy, durable, UV stabilized plastic polymers and galvanized steel/aluminium posts with non-toxic coatings, suitable for prolonged outdoor exposure.

a) Stainless steel hardware is to be used. Decks are to be of non-slip surfaces.

b) All swings are to be provided with PVC coated galvanized swing chains and slash-proof rubber seats.

c) All play structures and independent play events are to be of visually stimulating bright primary colours.

d) All playgrounds shall have fall-absorbing surfaces to help protect against injuries due to falls. These surfaces provided shall be continuous and link all the play equipment together.

e) The proposed playgrounds shall not be vandalism prone.

f) The playgrounds shall have green fields to promote activities in nature to the children.

g) The universal design aspect of facilities must not be compromised.

h) All playgrounds shall be equipped with rubbish/recycling bins, shaded trees, and energy-efficient/renewable energy gardens lights.

i) The quality and safety standards of the children playing facilities shall comply with any of the following requirements.

i. MS 966: Part 1: Playground Equipment Specification for Materials.

ii. MS 966: Part 2: Playground Equipment General Safety Requirements.

8.1.6 Where required as stated in MBOR or authority requirement, recreational facilities shall be as follows:

a) A Par Course Fitness Trail facilities:
Consists of a par course with outdoor exercise equipment or obstacles installed along its length.

b) One (1) badminton court complete with lines, net-poles, net, and galvanized mild steel umpire chair.

c) One (1) football ground complete with lines, goal posts, and net.

d) Four (4) volleyball court complete with lines, net-poles, net, and galvanized mild steel umpire chair.

8.1.7 A children's playground shall be provided within the living accommodation or staff family quarters within the site. All playground equipment shall have a minimum number of composite structure and independent play events inclusive of, but not limited to, the following:

a) Composite Play Structure:

i. Two (2) slides.
ii. Poles and Climber.
iii. Challenge ladder.

b) Independent Play Events:

i. Two (2) see-saws.
ii. Four (4) swings with two (2) infant seats.
iii. Two (2) spring events.

SECTION 9.0: MAINTENANCE

9.1 GENERAL

9.1.1 This section shall be read in conjunction with the Need Statement for Total Assets Management.

9.1.2 The successful tenderer shall prepare, submit, and manage the building project's operation and maintenance to ensure optimal building performance during the Defects Liability Period (DLP).

9.1.3 The successful tenderer is required to provide qualified and competent professionals to implement the maintenance program.

9.1.4 The successful tenderer shall incorporate design for maintainability in their design to avoid a loss to the government and affect productivity due to the following:

a) High operation and maintenance costs.

b) Longer waiting time for repair works.

c) High downtime of systems/components.

d) Risk of accident/injury during maintenance and repair works.

9.1.5 The successful tenderer is required to provide the training on operation and maintenance to the government (the Client's representative) so that the government can smoothly undertake the said project's maintenance and operation.

9.1.6 Materials and equipment shall be replaceable and capable of easy maintenance/repair and integration with other maintenance systems.

9.1.7 All repair works performed and items replaced during the maintenance period shall be subjected to a further similar guarantee from the date of repair/replacement.

9.1.8 The successful tenderer shall provide rooms for the maintenance team and works (e.g., Utility Room, Janitor Room, etc.).

9.2 HANDOVER MANUAL AND MAINTENANCE MANUAL

9.2.1 The successful tenderer shall prepare and submit four (4) sets of Handover Manual and Operation and Maintenance Manual to the PD's satisfaction and approval.

9.2.2 Contents of the Handover Manual:

a) The handover manual shall list down in detail the manufacturer's name, type, or model, including reference code for easy maintenance, warranty, and guarantee where applicable. The following information shall be incorporated inside the handover manual:

i. Schedule of all Internal and External Wall and Floor Finishes.

ii. Schedule of Paint Work (Paint manufacturer, type, and colour code).

iii. Schedule of Windows and Doors (Manufacturer/Supplier).

iv. Schedule of Ironmongery (Manufacturer and warranty).

v. Schedule of Sanitary Fittings (Manufacturer, model, and code).

vi. Schedule of Built-in Furniture (Manufacturer and maintenance guide).

vii. Schedule and Inventory List of Loose Furniture and Equipment.

viii. Schedule of Fittings and Accessories.

ix. As-Built Drawings for Architectural Building Works, M&E Works, and C&S Works.

b) This information shall be supplied for the JKR's review in the following format:

i. Specially written information shall be on A4 size pages with typed text using double spacing and in a format agreed prior to submission.

ii. Drawn information shall generally be on A1 or A3 size sheets, carefully selected and edited to include only those installed.

iii. All warranty and guarantee shall be for the said project, and it shall be issued by the manufacturer or licensed distributor locally.

9.2.3 Contents of the Maintenance Manual:

a) The Maintenance Manual shall incorporate all maintenance systems and give details of the operation and required maintenance of all items, components, and systems comprising the works.

b) This information shall be supplied for the JKR's review in the following format:

i. Specially written information shall be on A4 size pages with typed text using double spacing and in a format agreed prior to submission.

ii. Drawn information shall generally be on A1 size sheets.

iii. Standard published information shall be carefully selected and edited to include only those items installed.

c) The successful tenderer shall submit a digital copy in the form of Microsoft Word/ Excel Files (.doc/.docm/.docx)/(.xls/.xlsm/.xlsx) of the followings to the PD/PD's Representative.

9.2.4 The following component information shall be supplied for every item, component and/or system:

a) Certified manufacturing certificate.

b) Full description giving any special features. A full breakdown of the parts and the catalogue number of the constituent parts.

c) The guarantee period of any element or material where over the warranty required by the General Specification.

9.2.5 Maintenance Procedures: The Maintenance Manual shall include fully comprehensive details in respect of:

a) Cleaning procedures for all elements of the works.

b) Replacement procedures.

c) Regular cyclical maintenance procedures.

d) Repair procedures in the event of damage.

e) Washing methods, including the frequency and method of washing required to maintain performance and appearance. Details shall be provided in respect of the maximum time during which performance of components can be maintained, together with the frequency and method of washing required to achieve this.

9.3 DURABILITY

The performance criteria shall be satisfied with the works' full design life if the maintenance has always been carried out as specified by the successful tenderer.

9.4 ASSET REGISTRATION, TAGGING, AND INVENTORY

9.4.1 The successful tenderer shall implement the tagging and labelling to register all required asset components such as built-in and loose furniture, keys, locks, etc., and shall follow JKR's requirement.

a) This shall require registration of assets, inventory documentation, and collaboration with the client and the PD during the DLP.

b) All labelling for registration of Immoveable Asset Components shall comply with the latest JKR Standard Specification for Building Works.

9.4.2 The successful tenderer shall identify and label (*Blok, Aras dan Ruang*) asset information as per requirement of latest of *Garis Panduan Pengumpulan Data dan Pelabelan Aset Tak Alih* (PeDATA): *Aset Bangunan dan Sistem Kod Aset Tak Alih* (SKATA) in the drawings.

9.4.3 The successful tenderer shall collect and fill up asset information as per the requirement of *Garis Panduan* PeDATA: *Aset Bangunan.* All related forms/templates shall be submitted to the PD/PD's Representative.

9.4.4 The successful tenderer shall supply and install asset tagging (*Daftar Premis Aset* (DPA), *Daftar Aset Khusus* (DAK) – *Peringkat Blok, Aras dan Ruang*) that comply with PeDATA specification and SKATA.

9.4.5 The successful tenderer shall provide a complete set of hard copy together with a digital copy to the PD/PD's Representative for registration and tagging works.

9.4.6 The successful tenderer shall compile the asset information as per the requirement of the latest *Garis Panduan* PeDATA: *Aset Bangunan.*

9.4.7 The successful tenderer shall submit a digital copy in the form of Microsoft Word/ Excel Files (.doc/.docm/.docx)/(.xls/.xlsm/.xlsx) of the followings to the PD/PD's Representative:

a) Floor Layout Plan drawings (format or any other format as approved by PD/PD Representative) using 'SKATA room naming convention' in hardcover binding.

b) Asset information forms/templates (.xls/.xlsm/.xlsx format or any other format as approved by PD/PD Representative) and List of DAK Komponen (as per *Borang D.A 7* in *Garis Panduan* PeDATA: *Aset Bangunan.*

9.5 AS-BUILT DRAWING

9.5.1 The as-built drawing shall be provided as per contract requirement.

9.5.2 The successful tenderer shall provide a complete set of hard copies and a digital copy of as-built drawings to the PD/PD's Representative for the as-built drawings registration process at Jabatan Kerja Raya Malaysia database.

9.5.3 The preparation and submission of drawings shall be as per requirement of latest *Garis Panduan Pengurusan Lukisan Siap Bina* and *Garis Panduan* PeDATA: *Aset Bangunan.*

9.5.4 The successful tenderer shall submit a digital copy in the form of AutoCAD files (.dwg), Revit files (.rvt), and PDF files (.pdf) to the PD/PD's Representative.

SECTION 10.0: TENDERER'S PROPOSAL AND SUBMISSIO DOCUMENTATION

A. TENDERERS

10.1 DESIGN PROPOSAL

10.1.1 The design proposal shall be professionally developed and refined to meet each type of building's proper functional requirements and each room's correct functioning. The proposal shall comply with the Local Authority requirements and meet all other government agencies' regulatory requirements and approvals.

10.1.2 The tenderers are required to submit a design proposal consisting of a design report, drawings, specifications, schedules, calculations, catalogues, etc., for the intended project in accordance with the work's requirements.

10.1.3 Descriptions of planning principles and design descriptions shall be submitted, complete with diagrams/charts of vehicular/pedestrian traffic flow, security, and the various zones.

10.2 DESIGN REPORT

10.2.1 Design report shall consist of but not limited to the followings:

a) Planning and design concepts and principles of the proposal.

b) Design descriptions of the proposal.

c) Schematic drawings and sketches showing design intent.

d) Diagrams and activity workflow (zoning, circulation, etc.)

e) Proposed design work programme.

f) IBS Score Calculation.

g) Proposal of Master key System.

h) Proposal of Internal and External Signages.

10.3 DRAWINGS AND SCHEDULES

10.3.1 All drawings submitted shall be in the metric system unit.

10.3.2 Drawings submitted shall consist of but not limited to the following:

a) Key and Location Plan of the project site.

b) Master Plan of the entire site development, showing the layout of the buildings and infrastructure.

c) Detailed site layout of buildings, confined to the area to be developed only, was accurately surveyed and presented in a minimum scale of 1:500.

d) Floor plans, elevations, sections, and perspective views (interior and exterior) of all buildings.

e) All relevant Interior Design.

f) Landscape drawings.

g) All other pertinent support drawings for evaluation purposes.

10.3.3 The drawings shall indicate building materials and finishes for floors, walls, ceilings, roofs, and structural components to be used.

10.3.4 Floor plans shall also indicate the position and extent (length and height) of the built-in furniture and equipment proposed. A detailed design of built-in furniture shall be produced after the award of the tender.

10.3.5 Plans and drawings shall clearly indicate the name, use, room code, finishes, and size of every room or area.

10.3.6 All areas and rooms shall be indicated the type of ventilation in the floor plans.

10.3.7 Landscape Drawings

Landscape drawings shall consist of hard and soft landscaping works, complete with specifications of both landscaping materials. The tenderer is required to submit one (1) complete set of design proposal consisting of the brief write-up, design concept, drawings, specifications, and schedules but not be limited to the following:

a) Landscape design concept and write-up.

b) Landscape master plan.

c) Layout plan.

d) Elevations, sections, and perspective views.

e) Complete planting schedules with actual plant photos.

f) Planting details.

g) Working drawings, specifications, and catalogue required shall be submitted to the PD before construction.

h) Proposed maintenance schedules during DLP.

10.3.8 Interior Design Drawings

For interior design works, the tenderer shall submit one (1) complete set of design proposal consisting of the brief write-up, design concept, drawings specifications, and schedules as follows:

a) Coloured floor plans, reflected ceiling plans, elevations, and sections.

b) Perspectives of all proposed areas.

10.3.9 Schedules and Specifications

The tenderer shall submit schedules following the requirements of the brief as the following:

a) **Appendix 2 - Schedule of Accommodation and Finishes.**

b) **Appendix 3 - Schedule of Summary of Architectural Components and Materials.**

The tenderer shall submit a summary of architecture components and materials range of series shall be provided to support the specifications for all building materials. A minimum of three (3) equivalent alternatives shall be submitted for every specification proposed on materials.

B. SUCCESSFUL TENDERER

10.4 DESIGN REPORT

10.4.1 a) The successful tenderer shall submit a design report that consists of but not limited to the following:

i. Planning, design concepts, and principles of the proposal.

ii. Design descriptions of the proposal.

iii. Schematic drawings and sketches showing design intent.

iv. Diagrams and activity workflow (zoning, circulation, etc.).

v. Proposed design work programme.

vi. IBS score calculation.

vii. Preliminary Design Stage Assessment Report using pHJKR or other Green Rating Tools as required by the PD/Client.

viii. Accessibility Check List compliant to MS 1184:2014 Universal Design and Accessibility in Built Environment – Code of Practice, MS 1331:2003 Code of Practice for Access of Disabled Persons Outside Buildings (First Revision) and undertaking letter of compliance from the tenderer's consultant architect.

b) Upon confirmation of any changes to the architectural design, the successful tenderer shall submit a building model in a metric scale of a size approved by the Government. The model shall be the property of the Government.

c) The successful tenderer shall submit Manual Quality for the quality assurance system of architectural works to the PD for his approval before the works commence.

d) The successful tenderer shall comply with all Non-Conformance Report (NCR) prior to the Government's approval.

e) Upon confirmation of final interaction, all drawings and minutes of Room Data Interaction (RDI) meetings shall be in binding and submitted to the Government.

f) The successful tenderer is required to produce a framed 3-D presentation drawings in A2 size and animations of exterior and interior views of the proposal (e.g., artist impression, perspective drawings, computer graphics, etc.) of duration to the Government's approval.

g) The successful tenderer is required to document the construction process in the form of photographs, videos, and reports.

10.5 ROOM DATA DOCUMENTS

10.5.1 The successful tenderer shall organize room data interaction session(s) with the Client and JKR before submitting Final Room Data Documents and commencement of works on the site. The documents shall be signed and declared by the successful tenderer and all related consultants within eight (8) months after the Letter of Acceptance (LA). The documents shall be in five (5) spiral binding sets.

10.5.2 The Room Data Documents shall consist of a breakdown as follows:

a) Room Data

For every individual room, the list, descriptions, and specifications of the types of:

i. Floor, wall, and ceiling finishes.

ii. Loose and fixed furniture.

iii. Medical equipment (Group 1, 2, 3 and 4) and non-medical equipment.

iv. Doors and windows.

v. Ironmongeries.

vi. Sanitary wares and fittings.

vii. M&E services items such as lightings, switches, exhaust fans, fans, air-conditioning units, power sockets, telephone outlets, firefighting equipment, and any other M&E equipment.

viii. Any other items, which may be proposed or provided for the individual rooms.

Note: Refer to Sample of Room Data as attached in Appendix 10.

b) Drawings (Plans and Four Wall Elevations for each room/area). The drawings shall consist of the following:

i. Key Floor Plans.

ii. The floor plans, elevations, and ceiling plans of the individual rooms shall be fully loaded to show and indicate all the legends, types, descriptions, specifications, exact dimensions, locations, numbers, etc., of all the items outlined in the room data sheet. All the drawings for the individual rooms shall tally with the room data sheets provided.

c) Loaded Drawings reference manuals shall consist of reference fixtures and fittings of coding, drawings, and dimensions.

d) Minutes of RDI meeting(s).

10.6 SCHEDULE OF SPECIFICATION

10.6.1 The successful tenderer shall submit schedules following the requirements of the brief as the following:

a) Appendix 1 - Project Brief.

b) Appendix 2 - Schedule of Accommodation and Finishes.

c) Appendix 3 - Schedule of Summary of Architectural Components and Materials.

d) Appendix 4 - Schedule of Ironmongeries.

e) Appendix 5 - Schedule of Sanitary Fittings and Fixtures.

f) Appendix 6 - Schedule of Built-in Furniture.

g) Appendix 7 - Schedule of Healthcare Laboratory Furniture.

h) Appendix 8 - Schedule of Loose Furniture.

i) Appendix 9 - Schedule of Internal and External Signages.

j) Appendix 10 - Schedule of Room Data.

C. DOCUMENTATION FOR SUBMISSION

10.7 DOCUMENTATION FOR TENDERERS AND SUCCESSFUL TENDERER

10.7.1 Submission for tender shall consist of the following:

a) Recommended paper sizes for documentation, presentation, and submission shall be minimum as required (refer to Submission Checklist for tenderer and successful tenderer).

10.7.2 All A1 and A0 size drawings shall be submitted in booklet format (to be in binding and folded into a maximum of A3 size).

10.8 CHECKLIST FOR TENDERERS

	SUBMISSION CONTENT	MIN. PAPER SIZE / SCALE	COMPLIANCE (√)
A. DESIGN REPORT	Planning, design concepts and principles of the proposal.	A3	
	Design descriptions of the proposal.		
	Schematic drawings and sketches showing design intent.		
	Diagrams and activity workflow (zoning, circulation, etc.).		
	Proposed design work programme.		
	IBS score calculation.		
	Proposal of Master Key System.		
	Proposal of Internal and External Signages.		
B. ARCHITECTURAL DRAWINGS	Key and Location Plan of the project site.	A1	
	Master Plan of the entire site development.	A1/A0 1:500	
	Detailed site layout of buildings.	A1/A0 1:500	
	Floor Plans.	A1/A0 1:100	
	Elevations.		
	Sections.		
	Detail drawings (readable with standard scale).	A3	
	All relevant interior design and perspectives of all buildings.	A3	
	Exterior perspectives of all buildings – 3 nos.	A2	
	Landscape drawings.	A1	
	All other pertinent support drawings for evaluation purposes.	A3	
	Notes: The tenderer shall provide readable scaled drawings of the building as a whole.		
C. SCHEDULES	Appendix 2: Accommodation and Finishes.	A3	
	Appendix 3: Architectural Components and Material – minimum three (3) alternatives brands.		
	Notes: A minimum of three (3) alternatives shall be proposed for materials, furniture, and equipment.		

10.9 CHECKLIST FOR SUCCESSFUL TENDERER

	SUBMISSION CONTENT	MIN. PAPER SIZE / SCALE	COMPLIANCE (√)
A. DESIGN REPORT	Planning, design concepts and principles of the proposal.	A3	
	Design descriptions of the proposal.		
	Schematic drawings and sketches showing design intent.		
	Diagrams and activity workflow (zoning, circulation, etc.).		
	Proposed design work programme.		
	IBS score calculation.		
	Preliminary Design Stage Assessment Report		
	Accessibility Check List compliance and undertaking letter of compliance from the tenderer's consultant architect.		
B. ARCHITECTURAL DRAWINGS	Key and Location Plan of the project site.	A1	
	Master Plan of the entire site development.	A1/A0 1:500	
	Detailed site layout of buildings.	A1/A0 1:500	
	Floor Plans.	A1/A0 1:100	
	Elevations.		
	Sections.		
	Loaded plans.	A3/1:75	
	Room Data Documents: i. Room Data Sheets. ii. Drawings – Room/ Floor Plan Area and Four (4) Wall Elevations.	A3/1:50	
	Detail drawings (readable with standard scale).	A3	
	All relevant interior design and perspectives of all buildings.	A3	
	Exterior perspectives of all buildings – 3 nos.	A2	
	Landscape drawings.	A1	
	Notes: The tenderer shall provide readable scaled drawings of the building as a whole.		
C. SCHEDULES	Appendix 1: Project Brief.	A3	
	Appendix 2: Accommodation and Finishes.		
	Appendix 3: Summary of Architectural Components and Materials - minimum 3 alternatives brands.		
	Appendix 4: Ironmongeries.		
	Appendix 5: Sanitary Fittings and Fixtures.		
	Appendix 6: Built-in Furniture.		
	Appendix 7: Healthcare Laboratory Furniture.		
	Appendix 8: Loose Furniture.		
	Appendix 9: Internal and External Signage.		
	Appendix 10: Room Data.		
	Notes: A minimum of three (3) alternatives shall be proposed for materials, furniture, and equipment.		

SECTION 11.0: REQUIREMENT OF APPROVING AUTHORITIES

11.1 GENERAL

11.1.1 The successful tenderer shall appoint an Architect registered with the LAM, Malaysia, who is competent and experienced to execute all basic services and, where applicable, for supplementary services for the whole project. The tenderer shall bear the professional fees for the Architect's scope of services following the Architects Act 1967 and the Architect Rules (Scale of Minimum Fees) 2010.

11.1.2 The successful tenderer shall appoint a Landscape Architect and/or Town Planner competent and experienced to execute work required by the Local Authority for the said project. The tenderer shall bear the professional fees for the Landscape Architect and/or Town Planner's scope of services.

11.1.3 Where required by the Government, the successful tenderer shall appoint other consultants who are competent and experienced to execute works related to the said project. The tenderer shall bear the professional fees for the scope of services provided by these consultants to the Government's approval.

11.1.4 The successful tenderer shall obtain the approval requirements from the Local Authority and other technical agencies and comply with Malaysian statutory regulations and by-laws as highlighted below:

a) Planning Permission

The development proposed shall obtain planning permission and abide by all conditions imposed by the Local Planning Authority. Town, Country and Planning Act 1976 (Act 172) (TCPA) Section 19 and 20 require planning permission to be obtained prior to any development. Requirements for the planning permission shall include documents, layout plans, development proposal report, Environmental Impact Assessment (EIA) approval where required, and prescribed fees.

b) Building Approval

All building approval applications are required to be submitted to the respective local authorities as provided for under Section 70 of Street, Drainage and Building Act 1974 (Act 133) (SDBA). Term and technical requirements for submitting plans shall be in accordance with the UBBL. Submission for building plan approval shall be made by the Principal Submitting Person (PSP) and shall include submission of all drawings, calculations, and documents in an orderly manner.

c) Certificate of Completion and Compliance (CCC)

Upon satisfactory completion of the work and obtaining clearance or confirmation from the Local Authority and the respective technical departments, the PSP shall issue CCC for the said project.

d) Fire Certificate Designated

All designated premises must have a fire certification issued by JBPM as per Fire Services Act 1988. The PSP shall compile the necessary documents such as a copy of CCC, approved building plans, and land ownership for the client to submit for the fire certification.

11.1.5 The successful tenderer shall be responsible to liaise with the relevant Local Authority including other technical agencies regarding the infrastructure facilities required such as water supply, electrical power, telecommunication, firefighting requirements, drainage, sewerage, access roads, rubbish disposal, etc., and thus to provide all the requirements concerning them for this project.

11.1.6 Whenever required by the by-law or regulations, the successful tenderer shall be responsible to prepare and submit drawings, calculations, and/or documents to the relevant authorities for approval through the local practicing professionals who are registered with the relevant boards.

11.1.7 Prior to submission to the approving authorities, the PD shall agree with all designs, drawings, and specifications. A copy of all correspondences and replies to/from the approving authorities shall be extended to the PD.

11.1.8 The successful tenderer shall be responsible to inform the respective technical departments regarding the project's development, such as the Town Planning Department, the Local Authorities Council, etc.

APPENDICES

LIST OF APPENDICES

APPENDIX			REFERENCE TO SECTION
APPENDIX 1	**-**	PROJECT BRIEF	**1, 2, 3, 10**
APPENDIX 2	**-**	SCHEDULE OF ACCOMMODATION AND FINISHES	**5**
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APPENDIX 5	**-**	SCHEDULE OF SANITARY FITTINGS AND FIXTURES	**10**
APPENDIX 6	**-**	SCHEDULE OF BUILT-IN FURNITURE	**10**
APPENDIX 7	**-**	SCHEDULE OF HEALTHCARE LABORATORY FURNITURE	**10**
APPENDIX 8	**-**	SCHEDULE OF LOOSE FURNITURES	**10**
APPENDIX 9	**-**	SCHEDULE OF INTERNAL AND EXTERNAL SIGNAGES	**10**
APPENDIX 10	**-**	SCHEDULE OF ROOM DATA	**10**
GLOSSARY AND ABBREVIATIONS			-

Notes:
The schedules attached in the appendices shall only be a guide for the tenderers in submitting the actual proposal for this project. It shall be referred to as a guide for the minimum standard and requirements of the government. Further improvements and refinements are highly expected from the tenderers and they shall comply with all the design requirements as stipulated in the Pre-Bid document.

APPENDIX 1:

PROJECT BRIEF

APPENDIX 1 - PROJECT BRIEF

	SUBJECT	DESCRIPTION
A	**PROJECT TITLE**	
B	**PROJECT SITE**	
	KEY PLAN	
	LOCATION PLAN	
	SITE PLAN	(lot, road, district, state), with an approximate site area in (acres/hectares/meter square).
C	**DESCRIPTION OF SITE CONDITIONS**	
D	**PROJECT COMPONENTS**	Refer to Medical Brief of Requirements (MBOR). Example: i) Bangunan Pentadbiran ii) Dewan Serbaguna iii) Gelanggang Tennis iv) Auditorium
E	**MISCELLANEOUS**	Additional informations / attachments Example: i) Location of main entrance ii) Information of minimum floor areas requirement (1) iii) SOA of similar / likewise projects (2) iv) Etc.

Notes:

(1) The information of minimum floor areas (if attached), shall only be a guide for the tenderers in submitting the actual proposal for this project. It shall be referred to as a guide for the minimum standard and requirements of the government. Further improvements and refinements are highly expected from the tenderers and they shall comply with all the design requirements as to ensure proper functioning and fit for purpose spaces.

(2) SOA attached (if any) are intended for reference purpose only for the tenderers to idealize the proper flow and function of the health facilities proposal.

APPENDIX 2:

SCHEDULE OF ACCOMMODATION AND FINISHES

APPENDIX 2 – SCHEDULE OF ACCOMMODATION AND FINISHES

PROJECT TITLE :
LOCATION :

LEVEL	DEPARTMENT	CODE	SPACE / FUNCTION / ROOM / AREA DESIGNATION	CAPACITY	NORMS FLOOR AREA (m^2)	TOTAL FLOOR AREA (m^2)	FINISHES*				CEILING HEIGHT	VENTILATION	REMARKS
							FLOOR	SKIRTING	WALL	CEILING			
			Nett Floor Area (NFA)										
			Nett Floor Area (NFA)										
			Total Nett Area										
			Total Circulation										
			Total Services										
			TOTAL GROSS FLOOR AREA (GFA)										

Declaration (signed by Architect):

……..…….

Notes:
(1) The tenderers shall follow as closely as possible space and building requirements in the brief. Where the size of a room/area has not been specified, the tenderers shall analyse the specific requirements to satisfy the proper function of that room/area.

(2) Finishes - Refer legend.*

LEGEND – FINISHES

A. FLOOR

NO.	CODE	DESCRIPTION
1.	**V1**	Heavy-duty Vinyl flooring
2.	**V2**	Anti-static Vinyl Flooring
3.	**V3**	Anti-slip Vinyl Flooring
4.	**V4**	Heavy-duty, fully flexible, and resilient for sports flooring and children play area
5.	**V5**	High resistance to Chemical
6.	**CP1**	Heavy-duty carpet flooring (loop pile 36 oz.)
7.	**CP2**	Heavy-duty carpet tiles (300 x 300 mm 26 oz.)
8.	**CP3**	Heavy-duty carpet flooring (loop pile 26 oz.)
9.	**CP4**	Heavy-duty carpet tiles (300 x 300 mm 26 oz.)
10.	**TP1**	Medium duty timber strip (Glueing System)
11.	**TP2**	Heavy-duty timber strip (e.g., HDF Board or equivalent)
12.	**FH**	Cement sand screed with floor hardener
13.	**EP**	Cement sand screed with Epoxy Coating & Floor Hardener
14.	**LK**	Waterproofed cement sand screed/power float
15.	**GN**	Selected Granite Floor Tile (300 x 300 mm)
16.	**GN1**	Selected Granite Floor Tile (600 x 600 mm)
17.	**PGN1**	Selected Porcelain Floor Tiles (600 x 600 mm) Polished (Classification Group BIa/B1b)
18.	**PGN2**	Selected Porcelain Floor Tiles (600 x 600 mm) (matt) (Classification Group BIa/BIb)
19.	**CT1**	Ceramic Tiles (300 x 300 mm) (Glossy Finish) (Classification Group BIb/BIIa/BIIb)

NO.	CODE	DESCRIPTION
20.	**CT2**	Ceramic Tiles (300 x 300 mm) (Glazed finish) (Classification Group BIb/BIIa/BIIb)
21.	**CT3**	Ceramic Tiles (300 x 300 mm) (matt finish) (Classification Group BIb/BIIa/BIIb)
22.	**HT1**	Porcelain Tiles (300 x 300 mm) (Glossy finish) (Classification Group BIa/BIb)
23.	**HT2**	PorcelainTiles (300 x 300 mm) (Glazed finish) (Classification Group BIa/BIb)
24.	**HT3**	Porcelain Tiles (300 x 300 mm) (matt finish) (Classification Group BIa/BIb)
25.	**CP2.1**	Heavy-duty carpet tiles (300 x 300 mm 36 oz.) with raised flooring system
26.	**30CSP**	Cement sand screed with waterproofing
27.	**PPP**	Plaster with class 'O' P.U Paint
28.	**CM**	Chequed Aluminium Metal Plate
29.	**SD**	Specialist Detail
30.	**CR**	Cement sand screed, smooth finish

B. SKIRTING

NO.	CODE	DESCRIPTION
1.	**SV**	100 mm high heavy-duty skirting to match
2.	**SHT2**	100 (h) x 300 x 300 mm Porcelain Tiles to match (Classification Group BIa/BIb)
3.	**SGN**	200 (h) x 300 x 300 mm granite to match
4.	**STP**	75 mm (h) Timber skirting to match
5.	**SAL**	100 mm (h) Alum. skirting to match
6.	**SD**	Specialist Detail
7.	**TSI**	100 mm high timber skirting

C. WALL

NO.	CODE	DESCRIPTION
1.	**PP / SP**	Plaster & Paint
2.	**SP1**	Plaster & Coating
3.	**AC1**	Acoustic Fabric panel
4.	**AC2**	Acoustic Metal panel
5.	**CT1**	Ceramic Tiles (300 x 300 mm) (Glossy finish) (5. Ft.) (Classification Group BIII)
6.	**CT2**	Ceramic Tiles (300 x 300 mm) (Glossy finish) (Ceiling Hgt) (Classification Group BIII)
7.	**MO**	Mosaic Tiles (50 x 50mm)
8.	**HT1**	Homo. Tiles (300 x 300 mm) (Glossy finish) (Classification Group BIa/BIb)
9.	**HT2**	Homo. Tiles (300 x 300 mm) (Glazed finish) (Classification Group BIa/BIb)
10.	**GN**	Selected Granite tiles (300 x 300 mm) (Polished finish)
11.	**CS**	Color bond Steel strip panel
12.	**AL**	Alum. Strip Panel
13.	**AC**	Metal Stud Acoustic Gypsum board partition
14.	**CER**	Frameless Mirror Glass
15.	**DG1**	Frameless Tempered glass
16.	**DG2**	one way mirror
17.	**DK**	Selected heavy-duty fabricwall
18.	**KK**	Selected fabric & timber veneer & panelling with fabric finish
19.	**SD**	Specialist Detail

D. CEILING

NO.	CODE	DESCRIPTION
1.	**FB1**	Mineral Fibre Acous. Ceiling (600 x 600 mm)
2.	**FB2**	Mineral Fibre Acous. Ceiling (600 x 1200 mm)
3.	**UC1**	Suspended Ceiling (600 x 600 mm)
4.	**UC2**	Suspended Ceiling (600 x 1200 mm)
5.	**SK**	Skim coat plastering
6.	**PP**	Plaster & Paint
7.	**PC1**	Fibrous Plaster ceiling
8.	**PC2**	Fibrous plaster ceiling (metal section) with UPVC rain gutter
9.	**PC3**	Gypsum board ceiling suspended (600 x 1200 mm)
10.	**TP**	Timber strip ceiling
11.	**AI**	Alum. strip panel
12.	**LS**	Fibreglass cement rend
13.	**AS1**	Insulated aluminium strip ceiling
14.	**S1**	Aluminium panel suspended (600 x 600 mm)
15.	**UC1**	Ceiling fixed to timber support complete with Acoustical Insulation (600 x 1200 mm)
16.	**UC2**	Ceiling fixed to timber support (600 x 1200 mm)
17.	**UC3**	Ceiling fixed to timber support with thermal insulation (600 x 1200 mm)
18.	**SD**	Specialist Detail

Note :
The Schedule is given for reference only.

APPENDIX 3:

SUMMARY OF ARCHITECTURAL COMPONENTS AND MATERIALS

APPENDIX 3 – SUMMARY OF ARCHITECTURAL COMPONENTS AND MATERIALS

NO.	FINISHES		DESCRIPTION	PERFORMANCE SPECIFICATIONS	BRAND 1	BRAND 2	BRAND 3	REMARKS
					RANGE / SERIES	RANGE / SERIES	RANGE / SERIES	
1.0	DOORS	1.1	Door Frame					
		1.2	Door Leave					
		1.3	Fire Door Leave					
		1.4	Glass Door Leave					
		1.5	Automatic Door					
2.0	WINDOWS	2.1	Aluminum Frame (Powder Coated)					
		2.2	Glass/Glazing Panel					
		2.3	Fixed Alum. Louvres (Powder Coated)					
		2.4	Powder Coated					
3.0	CEILING	3.1	Ceiling Board / Ceiling T / Metal Suspension System					
		3.2	Laminated Gypsum Board					
		3.3	Gypsum Board					
		3.4	Acoustic Gypsum Board					
		3.5	Jointless Plasterboard					
		3.6	Decoratives Plaster Ceiling					
		3.7	Acoustic Ceiling					
		3.8	Jointless Plasterboard / P.U Paint					
		3.9	P.U Panel					
		3.10	Aluminium Strips Ceiling					
		3.11	Painted Soffit					
		3.12	Skim Coat					

NO.	FINISHES		DESCRIPTION	PERFORMANCE SPECIFICATIONS	BRAND 1 RANGE / SERIES	BRAND 2 RANGE / SERIES	BRAND 3 RANGE / SERIES	REMARKS
4.0	ROLLER SHUTTER	4.1	Roller Shutter / Fire-Rates Roller Shutter					
5.0	FLOOR FINISHES	5.1	**FLOOR TILES**					
		5.1.1	Homogeneous Tiles					
		5.1.2	Matt Finished Homogeneous Tiles					
		5.1.3	Polish Homogeneous Tiles					
		5.1.4	Heavy Duty Homogeneous Tiles					
		5.1.5	Ceramic Tiles					
		5.2	**VINYL**					
		5.2.1	Vinyl Type 1					
		5.2.2	Vinyl Type 2					
		5.2.3	Vinyl Type 3					
		5.2.4	Vinyl Type 4					
		5.2.5	Vinyl Type 5					
		5.3	**CARPET**					
		5.3.1	Heavy Duty Carpet (Normal)					
		5.3.2	Heavy Duty Carpet (Clinical)					
		5.3.3	Timber Skirting					
		5.4	**OTHERS**					
		5.4.1	Paving					
		5.4.2	Cement Render With Floor Hardener					
		5.4.3	Cement Render					
		5.4.4	Cement Render With Pebble Wash					
		5.4.5	Granite					
		5.4.6	Epoxy Self Leveling					
		5.4.7	Raised Computer Floor					

NO.	FINISHES		DESCRIPTION	PERFORMANCE SPECIFICATIONS	BRAND 1	BRAND 2	BRAND 3	REMARKS
					RANGE / SERIES	RANGE / SERIES	RANGE / SERIES	
6.0	BRICK/ BLOCK							
7.0	DRYWALL							
8.0	WALL FINISHES	8.1	**WALL FINISHES**					
		8.1.1	Emulsion Paint (Washable)					
		8.1.2	Emulsion Paint (Normal)					
		8.1.3	Epoxy Paint					
		8.1.4	Polyurethane Paint					
		8.1.5	Mural Paint					
		8.2	Barium Plaster					
		8.3	Wall Paper					
		8.4	**WALL TILES**					
		8.4.1	Glazed Ceramic Tiles					
		8.4.2	Polished Homogeneous Tiles					
		8.5	Acoustic Wall					
		8.6	Polyurethane Panel / Foam					
		8.7	Sound Proofing					
		8.8	External Paint					
		8.9	Timber					
		8.10	Metal					
9.0	ROOF	9.1	Metal Deck					
		9.2	Insulation					
10.0	SANITARY WARES / FITTINGS		Sanitary Wares (Refer To Schedule Of Sanitary Fittings & Fixtures)					

NO.	FINISHES		DESCRIPTION	PERFORMANCE SPECIFICATIONS	BRAND 1	BRAND 2	BRAND 3	REMARKS
					RANGE / SERIES	RANGE / SERIES	RANGE / SERIES	
11.0	TOILET CUBICLES PHENOLIC PANEL							
12.0	RAIN WATER GOODS		UPVC Gutter & Rainwater Downpipe					
13.0	ANTI-TERMITE PROTECTION							
14.0	WALL & COLUMN, BAR & CORNER PROTECTION AND GROOVE LINE							
15.0	BUILT-IN CABINET							
16.0	LAB BENCH AND FITTINGS							
17.0	HEAVY DUTY CUBICLE CURTAIN TRACK / I.V TRACK							
18.0	IRONMONGERY							
19.0	SIGNAGES							
20.0	MISCELLANEOUS	20.1	Water Proofing					
		20.2	Shading Device					
		20.3	Porch Entrance					
		20.4	Driveway And Car park					

Notes:
(1) All component which related to the Architectural Component shall refer to the Architectural Loaded Manual.
(2) All item location shall refer to Architectural Drawing.
(3) All material shall have a warranty provided by the supplier.
(4) All product selections are chosen and evaluated by the contractor based on the technical product specification.
(5) Brand Option 1 is the primary brand and will be changed to another option if the product does not achieve Architectural Brief's technical specification.
(6) The Schedule is given for reference only.

APPENDIX 4:

SCHEDULE OF IRONMONGERIES

APPENDIX 4 - SCHEDULE OF IRONMONGERIES

PROJECT NAME :
LOCATION :

SCHEDULE OF IRONMONGERIES					Hinges		Locksets & Latches				Accessories & Fittings							Closer		Key	Fire Door		
Ref	Location	Type	Leaf	Qty	H1	H2	L1	L2	L3	L4	A1	A2	A3	A4	A5	A6	A7	C1	C2	K1	F1	F2	F3

SAMPLE

CONTRACTOR :	CONSULTANT :	PROJECT DIRECTOR:	DATE :
			PAGE NO. :

Note:
The Schedule is given for reference only.

APPENDIX 5:

SCHEDULE OF SANITARY FITTINGS AND FIXTURES

APPENDIX 5 - SCHEDULE OF SANITARY FITTINGS AND FIXTURES

PROJECT NAME : LOCATION :					
TYPE	**DESCRIPTION / MODEL NO.**	**BRAND NAME**			**REMARKS**
		1	**2**	**3**	
Squatting Wc With Flush Valve					
Pedestal Wc With Flish Valve					
Washhand Basin To Toilet					
Vanity Top With Integral Bowl To Toilet					
Soap Dispenser					
Soap Holder					
Urinal Bowl					
Shower Rose With Stop Cock					
Shower Tray					
Stainless Steel Sink Single Bowl, Double Drainer					
Toilet Roll Holder					
CONTRACTOR :	CONSULTANT :	PROJECT DIRECTOR:			DATE : PAGE NO. :

Note:
The Schedule is given for reference only.

APPENDIX 6:

SCHEDULE OF BUILT-IN FURNITURE

APPENDIX 6 - SCHEDULE OF BUILT-IN FURNITURE

PROJECT NAME :
LOCATION :

SCHEDULE OF BUILT-IN FURNITURE		Specification	Supplier	Quantity	Material	Size	Colour
Ref	Location						
CONTRACTOR :		CONSULTANT :		PROJECT DIRECTOR:			DATE :
							PAGE NO. :

Note:
The Schedule is given for reference only.

APPENDIX 7:

SCHEDULE OF HEALTHCARE LABORATORY FURNITURE

APPENDIX 7 - SCHEDULE OF HEALTHCARE LABORATORY FURNITURE

PROJECT NAME :
LOCATION :

SCHEDULE OF HEALTHCARE LABORATORY FURNITURE		Specification	Supplier	Quantity	Material	Size	Colour
Ref	Location						
CONTRACTOR :		CONSULTANT :		PROJECT DIRECTOR:			DATE :
							PAGE NO. :

Note:
The Schedule is given for reference only.

APPENDIX 8:

SCHEDULE OF LOOSE FURNITURE

APPENDIX 8 - SCHEDULE OF LOOSE FURNITURE

PROJECT NAME :
LOCATION :

SCHEDULE OF LOOSE FURNITURE		Specification	Supplier	Quantity	Material	Size	Colour
Ref	Location						
CONTRACTOR :		CONSULTANT :		PROJECT DIRECTOR:			DATE :
							PAGE NO. :

Note:
The Schedule is given for reference only.

APPENDIX 9:

SCHEDULE OF INTERNAL AND EXTERNAL SIGNAGES

APPENDIX 9 - SCHEDULE OF INTERNAL AND EXTERNAL SIGNAGES

PROJECT: DEPARTMENT:							
Ref. No	Areas / Rooms	Description			Quantity	Location / Placement	Remarks
		Type	Material	Size			
CONTRACTOR:			CONSULTANT:			PROJECT DIRECTOR:	DATE : PAGE NO. :

Note:
The Schedule is given for reference only.

APPENDIX 10:

SCHEDULE OF ROOM DATA

DEPARTMENT: GENERAL | **ROOM/BAY: PUBLIC PRAYER ROOM (15 PAX)** | **ROOM SIZE: approx. 47.88 sq. meters** | **OCCUPANCY: 15 visitors** | **ROOM CODE***

A. ARCHITECTURAL REQUIREMENTS

A01. FINISHES

Wall	Ceiling	Floor	Skirting
EMP - Plaster & emulsion paint (washable) matt finish **WCT4** - 300mm x 300mm ceramic tiles, glossy finish up to ceiling height	**GB1** - 600mm x 600mm x 9mm thk. glass fibre gypsum board	**HT4** - 300mm x 300mm matt porcelain tiles	**ST** - 100mm (h) tiles to match

A02. DOOR

	Code	Qty	Grille	Vision Panel	Ironmongery	Door Protect	Push Plate	Crash Plate	Kick Plate
Door 1	P1Hp	2			✓				
	Special Req.				Remarks				
Door 2									
	Special Req.				Remarks				
Door 3									
	Special Req.				Remarks				
Door 4									
	Special Req.				Remarks				
Door 5									
	Special Req.				Remarks				
Others									

A03. WINDOW

	Code	Qty.	Grille	Window Level	Ironmongery	Special Req.	Remarks
Window 1							
Window 2							
Window 3							
Window 4							
Window 5							

A04. INTERNAL GLAZING

	Qty.
High level casement window	2

A05. HATCH / PASS THROUGH COUNTER

A06. SIGNAGES

	Qty.
Room Name (from corridor)	2
Room Name (internal)	

A07. BUILT-IN FURNITURES

	Qty.
BR11	2

A08. LABORATORY FURNITURES

A09. LOOSE FURNITURES

	Qty.
Bench with shoe rack	2
Long mirror M4	2
Cloth rail	2
Cloth hanger	4

A10. ACCESSORIES

	Qty.		
Floor Mounted/Wall Protection		Curtain Track	✓
Medical Cubical Track (MCT)		Blind	
IV Track		Artworks	
Wall guard		Corner guard	

A11. WALL TYPES

	Qty.
Cavity Wall	
Single Wall	✓
Double Wall	
Dry wall	
Curtain Wall	
Remarks / Others	

A12. SANITARY WARES & FITTING

	Qty.
F1 floor trap	4
T7 wuduk pillar tap	4

A13. OTHERS

B. MECHANICAL REQUIREMENTS

B1. MEDICAL GASES

i) GAS PIPING	BHP 1	BHP 2	Wall	PT S	PT Anaes Dry	PT Anaes Wet	Neo	A&E
Oxygen								
Nitrous Oxide								
Medical Vacuum								
Medical Air - 4 bar								
Surgical Air - 7 bar								
Surgical Air - 10 bar								
Etonox								
Other								

B2. FIRE PROTECTION (refer to BOMBA plan and building system approval)

Sprinkler System				
Pendant type		Conceal type		Sidewall
Fire Extinguisher				
CO2 Portable		DP portable		
Fire Alarm		Clean Agent		
Smoke Detector		Heat Detector		Combine
Alarm Bell		Flashing Light		Sounder

B3. AIR CONDITIONING & MECHANICAL VENTILATION

i.Ventilation				
Mechanical Vent	✓	Natural Vent		Ceiling Fan
Air Extraction - Mechanical Ventilation				
Ducted Exhaust:	2	Non Ducted Exhaust		
Air Filtration				
Normal Filters		HEPA Filters		
Usage				
Intermitten		Office Hours		
24 Hours	✓	Extended Hours		

ii) Air Conditioning			
Room Temperature ©		Air Change (ACH)	
Relative Humidity (%)		Room Static Level (Pa)	
Permissible Noise Level (dBA)		Total Exhaust	
Air Filtration			
Normal Filters		HEPA Filters	

iii) Air-conditioning (usage)			
Intermitten		Office Hours	
24 Hours		Extended Hours	

B4. WATER & DRAINAGE

Water Requirement		Qty.		Qty.
Cold Only		4	Hot & Cold	
RO Water			Outlet	4
Special Drainage Requirement				
		Qty.		Qty.
Grease Trap			Neutralised Tank	
Plaster Trap			Other	

B5. PNEUMATIC TUBE

B6. SPECIAL REQUIREMENT

C. INFORMATION & COMMUNICATIONS TECHNOLOGY REQUIREMENTS (ICT)

C1. NETWORK POINTS

UTP	STP	Wifi	Notes

C2. TELEPHONE

Specification	Type A	Type B	Type C	Fax
Quantity				
Digital/Analog/VOIP				
Other				

C3. COMPUTER

Workstation		Tablet		Laptop/Notebook	
Type	Qty	Type	Qty	Type	Qty

C4. PACS Workstation

Reporting Station	Viewing Station	Digitiser
Qty	Qty	Qty

C5. PRINTERS

Type	Qty		Qty
Network Printer (A3) Colour		Local Printer (A4) Black	
Network Printer (A4) Black		Local Printer (A4) Colour	
Network Printer (A4) Colour		Barcode Printer	

C6. MISCELLANEOUS

	Qty		Qty
Barcode Scanner		Mykad Reader	
Flatbed Scanner		Info Kiosk	
Video Conferencing		PC Trolley	
UPS(600VA)		Wireless AP	

D. ELECTRICAL REQUIREMENTS

D1. ILLUMINATION

i) Lighting Intensity		NOTES
Lux	300	

ii) Type	Type	Qty	
Flourescent	T5	10	refer ceiling plan
Downlight			

iii) Others	Type	Qty
Night Light		
Emergency Light		2
Warning Light		
Reading Light		

D2. VENTILATION SYSTEM

	Qty	NOTES
Ceiling Fan 1500		
Ceiling Fan 1200	2	
Wall Fan		
Fan Regulator		
Others		

D3. POWER SUPPLY

Type		BHP 1	BHP 2	Wall	PT A Dry	PT A Wet	PT S	OTP	Others
13A Single	Normal			4					
13A Single	Essential								
13A Single	UPS								
13A Twin	Normal								
13A Twin	Essential								
13A Twin	UPS								
15A Single	Normal								
15A Single	Essential								
15A Single	UPS								
Residual Current Device	RCD								
230V Termination	N								
230V Termination	E								
230V Termination	UPS								
Single Phase Isolator									
Three Phase Isolator									

D4. PUBLIC ADDRESS SYSTEM

PA SYSTEM	Qty	Notes
Ceiling speaker	2	
Volume Control		
Box Speaker		
PA Rack		
Others		

D5. MATV SYSTEM

MATV System	Qty	Notes
MATV Point		
TV set (32" c/w bracket)		
TV set (42" c/w bracket)		
Others		

D6. DIGITAL CALLING SYSTEM

Digital Calling System	Qty	Notes
Main Display Unit		
Display Unit		
Ticket Printer		
Counter/room terminal		
Others		

D7. NURSE CALL SYSTEM

Digital Calling System	Qty	Notes
A. PATIENT		
Cord		
Light		
Intercom/speech		
Pull Cord		
Code Blue		
B.STAFF		
Light		
Display		
Console		
Others		

D8. AUDIO VISUAL SYSTEM

Audio Visual System	Qty	Notes
LCD Projector		
Projector Screen		
Microphone		
Speaker		
AV Rack		
Others		

D9. SECURITY SYSTEM

Security System

A. CCTV System	Qty.	Notes
Dome Camera		
PTZ Camera		
Monitor		
Recorder/Decorder		
Others		

B. Access System	Qty.	Notes
Card reader w keypad		
Card reader w door release		
Intercom		
Intercom w door release		
Call bell		
Video Interconm		
Video Intercom w d/release		
Others		

C. Intercom System	Qty.	Notes
Audio Intercom		
Video Intercom		
Others		

E. MEDICAL & NON-MEDICAL EQUIPMENT REQUIREMENTS

Code GROUP 1 - FIXED EQUIPMENT RELATED TO MECHANICAL & ELECTRICAL

No.

Fixed Medical Equipment Related To Electrical

Item Code	Item Description	Qty.

Fixed Medical Equipment Related To Mechanical

Item Code	Item Description	Qty.

Code GROUP 2 :FIXED EQUIPMENT RELATED TO MECHANICAL & ELECTRICAL

No. Supply by Client & Install by Contractor

(E.g: salvageable items from an existing hospital)

Others

Item	Notes	Qty.

Code GROUP 3 - LOOSE EQUIPMENTS

No. Equipment Supply and Install by Client

Loose Medical Equipment

Item Code	Item Description	M/E	Qty.

Loose Non Medical Equipment

Item Code	Item Description	M/E	Qty.

Loose Medical Furniture

Item Code	Item Description	M/E	Qty.

Code GROUP 4 - CONSUMABLES

No. Others Detail/Equipment

Item Code	Item Description

F. REMARKS

Note:
* to be fill based on project

G. DISCLAIMERS

KEMENTERIAN KESIHATAN MALAYSIA	JABATAN KERJA RAYA MALAYSIA	HODT ARCHITECT	HODT MECHANICAL	HODT ELECTRIC/ICT	CLIENT
		CAWANGAN ARKITEK, JKR MALAYSIA	CAW. KEJURUTERAAN MEKANIKAL, JKR MALAYSIA	CAW. KEJURUTERAAN ELEKTRIK, JKR MALAYSIA	BAHAGIAN PERANCANGAN, KEMENTERIAN KESIHATAN MALAYSIA

DEPARTMENT : GENERAL
ROOM/BAY : PUBLIC PRAYER ROOM (15 PAX)
BIM MODEL : 010521 jkrAR19-3 (SRD2021 PrayerRoom 15Pax) (AME)
DATE : 1 MAY 2021

Note: The Schedule is given for reference only.

GLOSSARY

i. Sustainable Architecture

The art of designing physical objects and the built environment to comply with economic, social, and ecological sustainability principles. An integrated approach to design in creating a sustainable building. Describes environmentally conscious design techniques in the field of architecture.

ii. Prescribed activities

There are a total of nineteen (19) categories of prescribed activities, which include:

a) Agriculture.
b) Airport.
c) Drainage.
d) Irrigation.
e) Land reclamation.
f) Fisheries.
g) Forestry.
h) Housing.
i) Industry.
j) Railways.
k) Transportation.
l) Resort and recreation development.
m) Waste treatment and disposal.
n) Water supply projects.

iii. Environmentally Sensitive Areas (ESA)

Malaysian National Physical Plan (NPP) identified three classes of Environmentally Sensitive Areas (ESA). These are:

ESA Rank 1:
All protected areas, potential protected areas, wetlands, turtle landing sites, catchment areas of existing and proposed dams, and areas with contours above 1000 metres above mean sea level (a.m.s.l).

ESA Rank 2:
All other forests, wildlife corridors, buffer zones around ESA Rank 1 areas and areas with contours between 300-1000 metres a.m.s.l.

ESA Rank 3:
All marine park islands, buffer zones around ESA Rank 2 areas, catchment areas for water intakes, groundwater extraction areas (well fields), areas with erosion risk greater than 150ton/ha./year, areas experiencing critical or significant coastal erosion and areas between 150-300 metres a.m.s.l.

iv. Detailed Environmental Impact Assessment (DEIA)

A study is required for ten different types of projects, which include:

a) Steel mill.
b) Pulp and paper mill.
c) Cement plant.
d) Coal-fired power plant.
e) Dams (hydroelectric and water supply).
f) Coastal land reclamation.
g) Incinerators (scheduled wastes and solid wastes, solid wastes disposal sites).
h) Projects involving land clearance where more than 50% of the area has slope>25°.
i) Logging (>500 hectares).

It is to be noted that for projects in Sabah and Sarawak, specific local legislation on EIA requirements needs to be adhered to.

v. Industrialised Building System (IBS)

An Industrialised Building System (IBS) is defined as a construction technique that involves industrialised production of building elements or components and erection and assembly of these elements into the desired building structure through mechanical means. The components manufactured in a controlled environment (on or off-site), transported, positioned, and assembled into structure with minimal additional site work.

IBS aims to reduce dependency on foreign labour, lower wastages, fewer site materials, a cleaner environment, better quality, neater and safer construction sites, faster project completion, and lower total construction costs.

All IBS elements/components shall be locally manufactured or fabricated.

vi. Composite wood and agrifiber products

Particleboard, medium-density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates, and door cores

vii. Contract Drawing

Contract drawing is part of the Contract Document that need to be submitted by the successful tenderer. Contract Drawing consists of:

a) Presentation drawings and schedules for A3 technical proposal.

b) Main drawings (readable with standard scale):
- Architectural main drawings.
- Loaded plans.

c) Room Data Documents:
- Room data sheet.
- Drawings - Room/Area Floor Plan and four (4) wall elevations.

d) Exterior perspective drawings.

viii. Loaded Drawing

Loaded Drawing is part of the Contract Document that needs to be submitted by the successful tenderer. Loaded Drawings reference manuals consist of reference fixtures and fittings of coding, drawings, and dimensions.

ix. Medical & Non-Medical Equipment

Equipment provided in the facilities by group are as below:

a) Group 1 – Fixed Equipment Related to M&E
- Supply and install by the contractor as per contract document.
  (e.g., sterilizers, mortuary equipment, dental unit, diagnostic imaging, operating light, operating table, etc.)

b) Group 2 – Fixed Equipment Related to M&E
- Supply by the Client and install by the contractor.
  (e.g., salvageable items from an existing hospital).

c) Group 3 – Loose Equipment & Medical Furniture
- Equipment supply and install by the Client.
  (e.g., nebulizer electric, refrigerator drug, trolley utility SS rack, etc.)

d) Group 4 – Consumable
- Loose items, consumables, and storage implications. No M&E requirements within the building contract.
  (e.g., vehicles, clock wall, specimen tray, etc.)

x. Room Data Interaction

The successful tenderer shall organise room data interaction session(s) with the Client and JKR before submitting the Final Room Data Document.

CAWANGAN ARKITEK
Jabatan Kerja Raya Malaysia
Tingkat 11, Menara Tun Ismail Mohamed Ali
No. 25, Jalan Raja Laut, 50350 Kuala Lumpur

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