

Project Scope and Technical Requirements Document

Design and Build of a Prefabricated Technical and Vocational Education and Training (TVET) Center at R. Innamaadhoo

Procurement Type:

Design, Fabrication, Supply and Installation of Prefabricated Modular Building

(Design & Build)

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1. Project Overview

The Ministry invites bids for the **design, fabrication, delivery, and installation and construction** of a fully **prefabricated modular TVET institute** at R. Innamaadhoo, Maldives. The facility is intended for marine craft and boatbuilding training, comprising a large industrial workshop (hangar), administrative offices, training classrooms, and sanitation facilities. The structure must be modular, weather-resistant, transportable, and suitable for coastal environments, built with a focus on functionality and minimal on-site work.

In addition to the building works, the scope of supply also includes the provision of furniture for all classrooms, offices, staff areas, meeting rooms, and ancillary spaces, as specified in the Furniture Specification Sheet. The contractor shall also be responsible for the supply and installation of workshop items (equipment and machinery) required for boatbuilding training activities. This includes machine tools, storage units, and related operational fittings, as detailed in the Equipment Specification Sheet.





2. Design Scope

Architectural Design – Modular-compatible architectural design including detailed site layout, modular floor plans, roof plans, internal elevations, external elevations, sectional views, and 3D visualizations suitable for off-site construction and module assembly.

Structural Design – Full structural design optimized for prefabricated modular construction, covering foundation layout (with base plate and anchoring details), structural framing plans, member sizing, lifting points, modular joint details, structural connections, and required calculations for load distribution, stability, and safe transport and erection of modules.

MEP & Other Service Design – Prefab-ready Mechanical, Electrical, Plumbing, and ICT/security system designs with layout drawings, fixture placement, service routing, and load schedules, coordinated for modular integration and ease of on-site connection with the island network.

Interior Layout & Detailing – Functional interior space planning for modular construction including partition layouts, furniture positioning, fixture schedules, and service point allocation (power, data, HVAC, plumbing).

Water Management Systems – Integrated design for rainwater harvesting/diversion, stormwater drainage layout, and wastewater plumbing system with proper treatment or connection to septic tanks, all compatible with modular floor systems.

Fire Safety Plan – Fire safety design including extinguisher placement, fire escape routes, fire signage layout, and emergency lighting points, designed to comply with local fire codes and suitable for prefabricated assembly. The design must be approved from the relevant local authorities before implementation.

CCTV and Security Systems – Layout of surveillance camera locations, control points, wiring routes, and equipment positioning within modules, integrated with the building's overall ICT and power plan.

Landscaping and Boundary Wall Design – Simple outdoor layout including paved walkways, ramp access, seating, garden areas, shaded zones, surface drainage layout, outdoor lighting, and both creative and regulatory-compliant institute signage at the entrance and building façade.

A 2-foot-high masonry wall finished with a 2-inch reinforced concrete capping beam, designed for durability and clean detailing. Above this, powder-coated aluminum framing supports architectural-grade cladding panels, extending the overall boundary height to 6 feet. The design ensures both privacy and a cohesive aesthetic with the building's façade.

A sliding steel gate shall be provided at the main entrance, constructed from galvanized and powder-coated steel for durability and corrosion resistance. The gate shall operate on a smooth-track system with provision for both manual and motorized operation, including remote access and safety features. Design and finish shall align with the building's overall architectural character and boundary wall.

Prefabrication Detailing – Complete manufacturing drawings and modular assembly documentation including panel details, floor/roof connections, service integration, transportation layout, lifting diagrams, and step-by-step site installation procedures.

Bill of Quantities (BoQ) and Technical Specifications – A complete BoQ must be submitted with the design package, itemizing all components with descriptions, quantities, unit rates, and total cost. Technical specifications must be clearly defined for all elements including materials, finishes, fixtures, and systems, to ensure consistency with the design and ease of procurement.

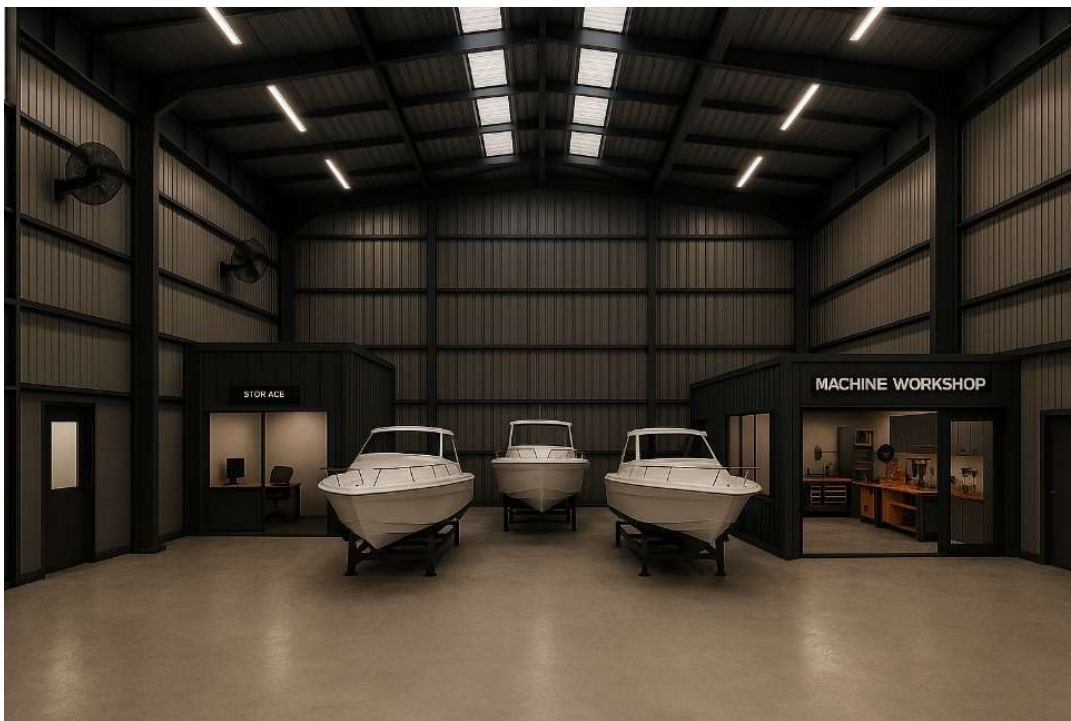
Bill of Materials (BoM) – A comprehensive Bill of Materials (BOM) shall be prepared, detailing all structural steel components required for the prefabricated structure, including beams, columns, bracings, connection hardware, and related accessories. In addition, the BOM shall incorporate specifications for all required furniture, ensuring complete alignment with the design and functional requirements of the facility.

3. Functional Zones, Requirements & Technical Specifications

3.1 Boatbuilding Workshop / Hangar

Purpose:

A specialized industrial workshop designed to facilitate hands-on training in fiberglass boatbuilding and repair, capable of supporting the construction of multiple vessels simultaneously within a controlled, safe environment.



3.1.1. Design and Functional Requirements:

- **Structure & Clear Height:**
 - Clear, unobstructed internal span of **9 meters**, without internal columns.
 - Vertical clearance sufficient for large vessel assembly and machinery operation, ideally equivalent to **2.5 to 3 storeys**.

- **Access:**
 - Entryways and movement routes must allow unobstructed passage of **hulls, vessels, and heavy equipment**, enabling efficient workshop operations and vessel handling.
- **Main Vessel Construction Zone:**
 - Large open floor area capable of accommodating **up to three mid-sized boats (minimum 30 feet in length)** positioned side-by-side.
 - Adequate clearance must be maintained around each project for safe working conditions, including end clearance for material and tool handling.
- **Flooring:**
 - **Non-slip, chemical-resistant industrial flooring**, suitable for fiberglass construction processes.
 - Flooring must withstand exposure to resins, solvents, and fiberglass dust while providing easy cleaning and dust suppression.
 - Anti-static or dust-control finishes are preferred.
- **Lighting:**
 - Uniform **LED lighting**, suitable for industrial workshop conditions, ensuring consistent and glare-free illumination across all work areas.
 - Emergency lighting to be installed in accordance with safety standards.
- **Ventilation:**
 - Efficient natural and mechanical ventilation system, including **louvers** and **exhaust fans**, to extract fumes and particulates generated by fiberglass work.
 - Ventilation must meet occupational health standards for air quality.
- **Power Supply:**
 - Distributed **3-phase industrial outlets** and single-phase sockets throughout the workshop to power machinery and hand tools.
 - **At least 2 electrical isolators** must be provided at clearly visible, accessible points for emergency shutdowns.
 - All electrical and data cables must be routed using overhead trays or wall-mounted conduits, keeping floors clear of obstructions.
- **Dust Extraction System:**
 - Centralized dust extraction system required, with ducted overhead routes and flexible connections to machinery.
 - Must include HEPA or equivalent filtration, a dust collection bin, and acoustic treatment of the motor unit to minimize noise.

3.1.2. Dedicated Functional Areas:

- **Machine Workshop Zone (Power Tools / Carpentry Area):**
 - Partitioned or semi-enclosed space for machinery operations such as cutting, sanding, drilling, and component preparation.
 - Designed with reinforced flooring, dedicated dust extraction points, separate ventilation, and localized power distribution.
- **Instructor Work Area:**
 - A small enclosed or semi-enclosed zone providing line-of-sight supervision of workshop activities.
 - Must include basic workstation setup with power and data connections.
- **Secure Storage Area:**
 - Lockable area for storage of tools, equipment, consumables, and safety gear, equipped with shelving and secure access.
- **Circulation & Safety Zones:**

- Clearly defined movement paths and buffer areas to facilitate safe operations and emergency egress.

3.1.3. Construction & Finishing Requirements:

- **Structural Frame:**
 - Clear-span **steel frame structure**, using modular prefabricated panels.
- **Wall Finish:**
 - **Marine-grade, weatherproof cladding**, resistant to corrosion and suitable for coastal environments.
 - Interior walls should be impact-resistant and easy to clean.
- **Roof:**
 - Insulated roofing with **heat-reflective materials** to improve thermal comfort.
 -

Note:

Specific machine layouts, workbenches, and safety equipment requirements are addressed separately in the **Furniture Specification Sheet** and **Workshop Item Sheet**.

3.2 Admin Area

The Admin Area includes all administrative and academic staff section, reception area, manager's office, meeting room, pantry, storage and security room.



3.2.1 Administrative Section

Purpose:

The primary administrative hub, facilitating coordination between staff, students, and visitors. This space will handle student services, general administration, and visitor reception.

3.2.1.1. Design and Functional Requirements:

- **Area:**
Area must be sufficient enough to provide workspace for multiple staff (6-8 staff) /circulation space and office furniture and appliances
- **Workstations:**
Layout must support approximately **6–8 staff workstations**, separated by modular partitions for operational privacy and efficiency.
- **Electrical and Data:**
 - **Power and data points must be accessible at each workstation** to support computers, phones, and related equipment.
 - A minimum of **16 power sockets** and **8 network points** distributed to ensure direct access from every desk.
- **Cable Management:**
 - All electrical and data cabling must be **concealed using cable trays, under-desk management systems, or integrated trunking.**
 - The design must prevent visible, loose cables to maintain a professional appearance and avoid tripping hazards.
- **Lighting:**
 - Adequate **LED lighting** (any suitable type for prefabricated construction) to ensure clear, comfortable working conditions.
 - **Emergency lighting** must be included for safety compliance.
- **Climate Control:**
 - **Split AC units**, appropriately sized to maintain a comfortable working environment throughout operating hours.
- **Interior Finishes:**
 - Use durable, easy-to-maintain finishes suitable for a high-traffic, professional administrative space.
- **Accessibility and Safety:**
 - Layout must provide **barrier-free access** to workstations and service stations.
 - Install emergency exit signage and emergency lighting as required.

Note:

Workstation furniture, partitions, and service station (Counter) are specified separately in the **Furniture Specification Sheet**.

3.2.2 Academic Section (Lecturer Workstation Area)

Purpose:

A shared workspace dedicated to academic staff, providing an area for lesson planning, teaching preparation, and administrative work.

3.2.2.1. Design and Functional Requirements:

- **Area:**
Designed to accommodate multiple lecturer workstations without overcrowding.
- **Workstations:**
Layout must provide space for approximately **6-8 individual workstations**, positioned to allow personal working space for each staff member.

Privacy partitions or low dividers may be considered to delineate workspaces if needed.

- **Electrical and Data Installations:**
 - **At least 20 power sockets**, positioned to ensure each workstation has direct access to electrical outlets.
 - **8 data/network points** for reliable internet connectivity at each workstation.
- **Lighting:**
 - **LED lighting** suitable for prefabricated construction (surface-mounted or ceiling-mounted), providing uniform and comfortable illumination.
 - Emergency lighting not required (optional as per final compliance checks).
- **Climate Control:**
 - **Split air-conditioning unit(s)** to maintain a comfortable environment during working hours.
- **Interior Finishes:**
 - Walls, floors, and ceilings to be finished with durable, easy-to-clean materials suited for office-like academic use.
- **Accessibility & Safety:**
 - Layout should ensure clear circulation paths and barrier-free access to all workstations.
 - Adequate consideration for safety signage and emergency exit visibility.

Note:

Desks, chairs, and related furniture and equipment are specified separately in the **Furniture Specification Sheet**.

3.2.3 Manager's Office

Purpose:

A small, private workspace for the institute manager or lead administrator, used for administrative work, meetings, and confidential discussions.

3.2.3.1. Design and Functional Requirements:

- **Area:**
Designed as a compact, private office space.
- **Electrical and Data Installations:**
 - **4 power sockets** for essential office equipment (e.g., computer, printer, charging devices).
 - **2 data/network points** to support internet and office systems.
- **Lighting:**
 - **LED lights** (any suitable type), providing clear and uniform illumination of the small space.
- **Climate Control:**
 - **Split air-conditioning unit**, appropriate for the small enclosed area.
 - **1 ceiling fan** to supplement air circulation as needed.
- **Interior Finishes:**
 - Professional, low-maintenance finishes on walls, floors, and ceilings suitable for an office environment.
- **Privacy and Accessibility:**
 - The space must ensure acoustic privacy and clear access, designed for minimal occupancy.



Note:

Furniture (manager's desk, chair, storage) is specified separately in the **Furniture Specification Sheet**.

3.2.4 Meeting Room

Purpose:

To provide a formal, professional space for staff meetings, internal discussions, briefings, and sessions with visitors. The room should offer a comfortable environment for collaborative discussions, decision-making, and small-scale presentations, supporting both face-to-face and virtual meetings as required.



3.2.4.1 Design and Functional Requirements:

- **Capacity:**
Comfortable seating for approximately **8–10 persons**, ensuring clear visibility and easy interaction.
- **Electrical and Data:**
 - Provision of **at least 4 power sockets**, positioned to support electronic devices and meeting equipment.
 - **2 data/network points** to support internet connectivity and conferencing systems.
- **Lighting:**
 - General **LED lighting** suitable for a formal meeting space, providing uniform, glare-free illumination.
 - Flexibility in lighting type (surface-mounted, ceiling-mounted, or integrated fixtures) as appropriate for prefabricated construction.
- **Climate Control:**
 - **Split air-conditioning unit(s)** sized appropriately based on the final room dimensions to ensure occupant comfort.
- **Interior Finishes:**
 - Professional, durable, and low-maintenance finishes for walls, floors, and ceilings suitable for a meeting environment.
- **Technology Integration:**
 - The room should be adaptable for **video conferencing systems, display screens**, and other presentation technologies.
 - **Cable management** should be integrated to conceal wiring and avoid clutter.
- **Safety and Accessibility:**
 - Doorways and circulation areas must comply with accessibility standards.
 - Emergency lighting and exit signage must be provided.

Note:

Furniture and AV equipment specifications are addressed separately in the **Furniture Specification Sheet**.

3.2.5 Pantry / Tea Room

Purpose:

A small, functional space designed for staff and lecturers to prepare refreshments and take short breaks. Intended for light, occasional use by a small number of staff.



3.2.5.1 Design and Functional Requirements:

- **Layout & Usage:**
 - Compact space sized for minimal daily use.
 - Must allow basic circulation without crowding.
- **Cabinetry & Plumbing:**
 - Basic **base cabinet** fitted with a **stainless-steel sink** and drainage system.
 - Small allocated space for essential appliances (e.g., kettle, microwave).
- **Electrical Installations:**
 - **At least 6 power sockets** positioned above counter level to serve small kitchen appliances.
- **Ventilation & Air Movement:**
 - **1 wall-mounted exhaust fan** for removal of heat, odors, and steam.
 - **1 wall-mounted or ceiling fan** to improve air circulation.
- **Climate Control:**
 - **Split air-conditioning unit** must be provided to ensure thermal comfort during use.
- **Lighting:**
 - **Basic LED lighting** (minimum 2 units) providing sufficient general illumination.
- **Interior Finishes:**
 - Moisture-resistant and easy-to-clean surfaces for walls, floors, and cabinetry to maintain hygiene.

- **Accessibility & Safety:**
 - Simple, uncluttered layout allowing clear access to sink, appliances, and power outlets.

Note:

Furniture, seating, and appliances are specified separately in the **Furniture Specification Sheet**.

3.2.6 Executive Toilets (Male & Female)

Purpose:

Dedicated high-standard toilets designed for use by senior staff or visitors, with all necessary fixtures contained within private, fully enclosed cubicles to ensure privacy and convenience.

3.2.6.1 Design and Functional Requirements:

- **Total Number of Units:**
- 4 fully enclosed individual toilet cubicles (2 male + 2 female)
- **Layout:**
Each cubicle must function as a **self-contained private restroom**, with all sanitary fixtures installed within the cubicle itself.
- **Fixtures in Each Cubicle:**
 - 1 Water Closet (WC)
 - 1 Hand shower (bidet spray) or faucet
 - 1 Ceramic wash basin
 - 1 Mirror (mounted above the wash basin)
 - 1 Towel hook or rail
 - 1 Small shelf or storage niche (optional, for toiletries)
- **Lighting:**
 - 1 to 2 ceiling-mounted LED lights per cubicle, moisture-proof, providing bright but comfortable illumination.
- **Ventilation:**
 - 1 ceiling or wall-mounted exhaust fan per cubicle to ensure proper ventilation and odor control.
- **Electrical Sockets:**
 - 1 wall-mounted power socket within each cubicle (optional, if required for maintenance or shaver use).
- **Flooring and Finishes:**
 - Non-slip, water-resistant tiled flooring in each cubicle.
 - Full-height tiled walls or other moisture-resistant wall finish.
 - Floor drain and proper waterproofing to ensure hygiene and ease of maintenance.
- **Doors & Privacy:**
 - Each cubicle must be fully enclosed with a solid door for complete privacy.
 - Doors to include locking mechanism from inside.
- **Accessibility & Comfort:**
 - Adequate internal circulation space for comfortable use of all fixtures.
 - Fixtures must be installed at ergonomic heights.



3.2.7 Security Room

Purpose:

Dedicated small room for security personnel and CCTV system monitoring with clear visibility of entry and exit points.



Specifications:

- **Area:** Approximately 6 m², sufficient to accommodate 1 workstation and storage, allowing easy flow and clear access.
- **Furniture:** 1 workstation desk with chair for security personnel (as per Furniture Specification Sheet)
- **Electrical Sockets:** Minimum 4 power sockets for CCTV equipment, monitors, and auxiliary devices
- **Data Points:** 2 network points to support CCTV system connectivity
- **Lighting:** 1 LED light for general use and 1 emergency light for safety
- **Ventilation:** 1 wall-mounted fan to ensure basic air movement
- **Windows:** Clear glass panels positioned to face the main entrance and exit points, allowing direct visual monitoring of visitor movement
- **Interior Finishes:** Durable, easy-to-clean materials suitable for continuous operational use

Note:

Furniture equipment are specified separately in the Equipment Specification Sheet.

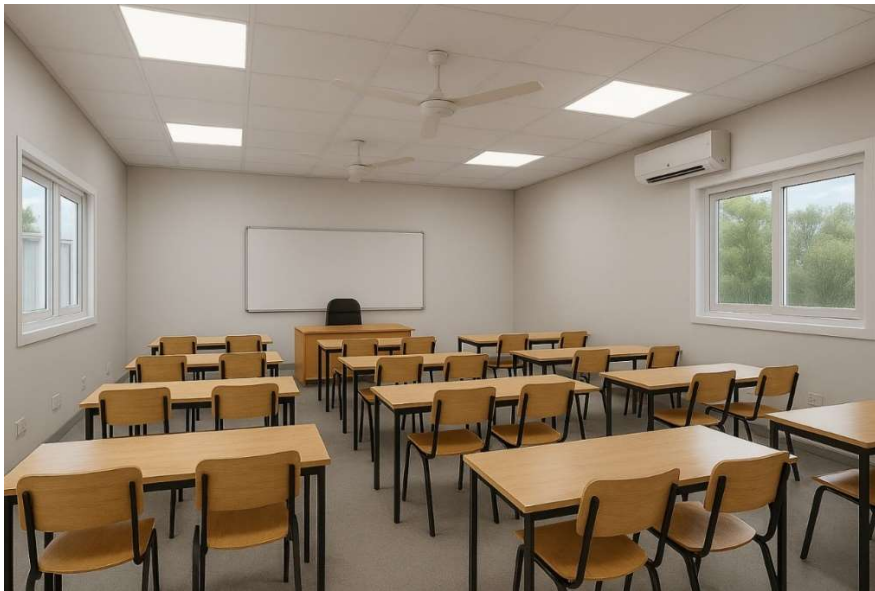
3.3 Academic Area

The Academic Area includes classrooms, ICT lab, and student sanitary facilities designed to support teaching, learning, and student wellbeing.

3.3.1 Classrooms (x2)

Purpose:

Designated spaces intended for general instruction, theoretical lessons, and technical education related to boatbuilding and vocational training programs. Each classroom must provide a conducive, comfortable, and functional learning environment.



Design and Functional Requirements:

- **Number of Rooms:** 2
- **Area:** Sized to comfortably accommodate approximately 20 students per room, allowing clear movement and visibility.
- **Use:** Spaces intended for theoretical instruction, lectures, and group learning.
- **Electrical and Data:**
 - Adequate **power sockets** positioned around each room for instructional devices.
 - **Network points** to support digital tools and teaching technologies.
- **Lighting:**
 - **LED lighting** for clear, uniform visibility.
 - Emergency lighting for safety compliance.
- **Climate Control:**
 - **Split AC units** for cooling and comfort.
 - **Ceiling fans** to support air circulation.
- **Interior Finishes:**
 - Durable, easy-to-clean wall and floor surfaces appropriate for classroom use.

- **Accessibility and Safety:**
 - Barrier-free access.
 - Emergency signage and lighting.

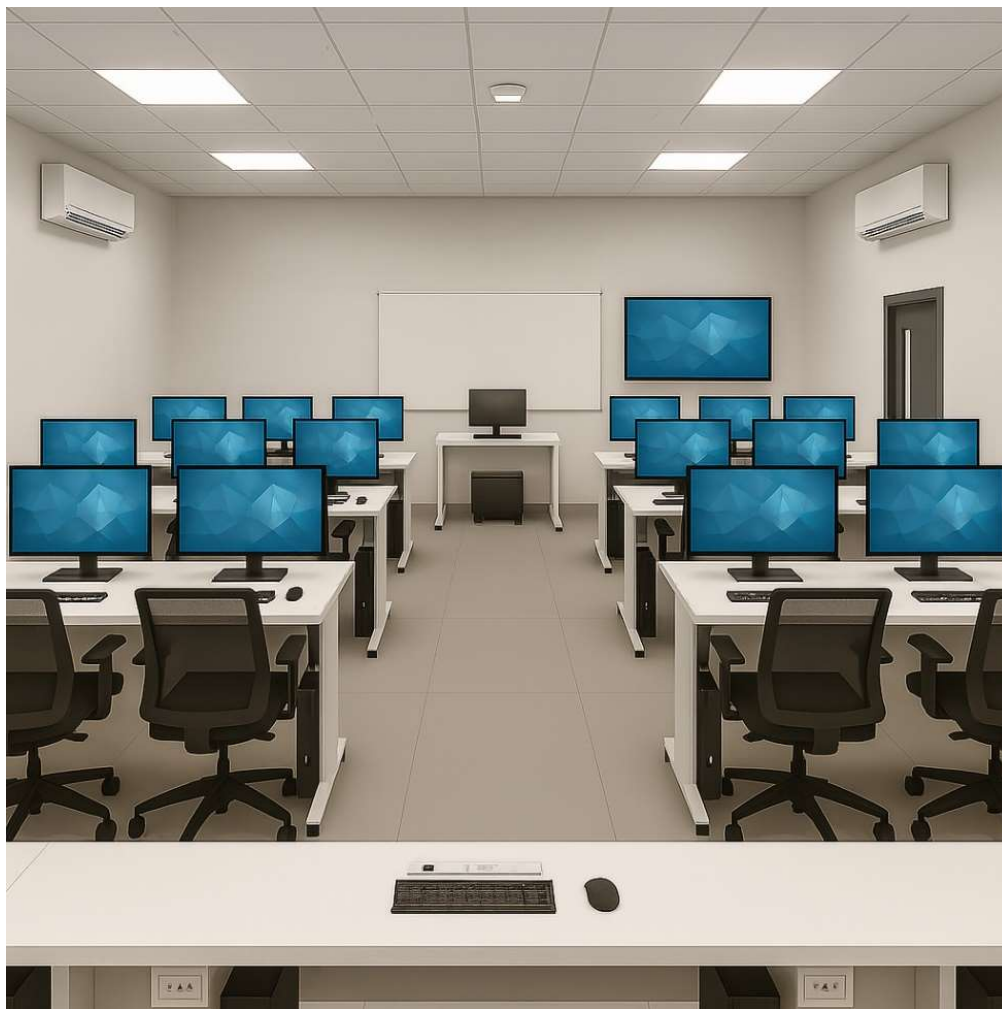
Note:

Furniture specifications (tables, chairs, whiteboards) are covered separately in the **Furniture Specification Sheet**.

3.3.2 ICT Lab

Purpose:

A specialized instructional space for digital literacy, technical drawing, and software-based training activities, supporting both individual and group learning.



Functional Requirements:

- Must accommodate around **20 students** simultaneously, with clear circulation space for ease of movement and instruction.
- Infrastructure must support continuous use of computers and digital tools, ensuring uninterrupted power supply and stable network connectivity.
- The environment should remain clutter-free and visually organized, minimizing distractions to support focused learning.
- **Area:**
Approximately **40 m²**, allowing efficient workstation layout and movement zones.
- **Electrical and Data:**
 - Multiple **power outlets** and **data points** provided within workstation areas to ensure accessibility to all students and lecturer.
 - **Cable management systems** must ensure:
 - All electrical and data cabling is fully concealed (under-floor trunking, cable trays, or integrated within workstations).
 - No visible, trailing, or obstructive cables.
 - Easy maintenance access without disrupting room use.
- **Lighting:**
 - Uniform **LED lighting** suitable for extended screen use.
 - **Emergency lighting** for safety.
- **Climate Control:**
 - **Split air-conditioning units** for consistent temperature control.
 - **Ceiling fans** to enhance air circulation.
- **Interior Finishes:**
 - Durable, low-maintenance wall and flooring materials appropriate for a technical learning space.
- **Safety and Accessibility:**
 - Workstations and pathways must comply with accessibility standards.
 - Emergency exits, signage, and lighting to be clearly provided.

Note:

Detailed specifications for workstations, seats, and IT equipment are outlined separately in the **Furniture Specification Sheet**.

3.3.3 Male Toilets (Students)

Purpose:

General use toilets for male students.

Specifications:

- **Total Area:** Approx. 8-10 m²
- **Toilet Stalls:** 2 WC cubicles, separated by full-height partitions for privacy
- **Wash Area:**
 - **Common Wash Basin Area with 2 basins**
 - **1 bathroom mirror** installed above the basins
- **Fixtures:**
 - **2 Water Closets (WCs)**
 - **2 Hand shower** (bidet spray) or water faucet installed adjacent to the WC for hygiene purpose
 - **2 Ceramic Wash Basins**
 - **1 Mirror**
- **Lighting:**
 - **2 to 4 LED ceiling-mounted lights** (energy-efficient and moisture-proof)
- **Ventilation:**
 - **2 exhaust fans** mounted at ceiling level for adequate airflow
- **Electrical:**
 - **2 wall-mounted power sockets** near the basin area (for maintenance/equipment use)



Additional Enhancements (as per layout/design feasibility):

- Wall-mounted hand soap dispensers
 - Paper towel or hand dryer units
 - Non-slip tiled flooring
 - Floor drains with waterproofing layer
-

3.3.4 Female Toilets (Students)

Purpose:

General use toilets for female students.

Specifications:

- **Total Area:** Approx. 8-10 m²
- **Toilet Stalls:** 2 WC cubicles, separated by full-height partitions for privacy
- **Wash Area:**
 - **Common Wash Basin Area with 1 basin.**
 - **1 bathroom mirror** installed above the basins
- **Fixtures:**
 - **2 Water Closets (WCs)**
 - **2 Hand shower** (bidet spray) or water faucet installed adjacent to the WC for hygiene purpose
 - **1 Ceramic Wash Basins**
 - **1 Mirror**
- **Lighting:**
 - **2 to 4 LED ceiling-mounted lights** (energy-efficient and moisture-proof)
- **Ventilation:**
 - **2-4 exhaust fans** mounted at ceiling level for adequate airflow
- **Electrical:**
 - **2 wall-mounted power sockets** near the basin area (for maintenance/equipment use)



Additional Enhancements (as per layout/design feasibility):

- Wall-mounted hand soap dispensers
 - Paper towel or hand dryer units
 - Non-slip tiled flooring
 - Floor drains with waterproofing layer
-

3.3.5 PWD Toilet

Purpose:

To provide an accessible, barrier-free toilet facility designed specifically for use by persons with disabilities (PWD).

Specifications:

- **Total Area:** Approx. 4-6 m²
- **Fixtures:**
 - **1 Accessible WC (Toilet Bowl)** with side and rear grab bars installed for support
 - **1 Hand shower** (bidet spray) or water faucet installed adjacent to the WC for hygiene purpose
 - **1 Ceramic Wash Basin** with integrated or adjacent **grab bars**
 - **1 Large Wall-Mounted Mirror** positioned at a lower height (accessible to wheelchair users)
- **Grab Bars:**
 - Stainless steel, foldable and fixed grab bars installed beside the WC and basin for support and safety
- **Lighting:**
 - **1 LED light** (moisture-proof and glare-free)
- **Ventilation:**
 - **1 exhaust fan** to ensure proper air circulation
- **Electrical:**
 - **1 wall-mounted power socket** (positioned away from water fixtures, intended for maintenance or equipment)
- **Door:**
 - Wide, outward-opening door (minimum clear opening of 900 mm)
 - Lever-type handle or push/pull plate for ease of access
 - Low threshold (or ramped edge) for wheelchair accessibility
- **Flooring:**
 - Non-slip, matte-finish tiles or epoxy flooring
 - Proper floor slope with a central floor drain
- **Additional Features:**
 - Emergency call button (optional)
 - Wall-mounted hand soap dispenser within reach
 - Paper towel holder or hand dryer at accessible height



3.4. Multi-purpose Learning Space

3.4.1. Purpose:

A flexible, adaptable space designed to support hands-on group work, collaborative learning, practical workshops, and creative activities. The space must be open, reconfigurable, and capable of supporting various training formats, encouraging active participation and teamwork among students.



3.4.2. Design and Functional Requirements:

- **Area:** Approximately **85-90 m²** sufficient to allow simultaneous group activities without overcrowding.
- **Flexibility:**
The layout must support different training formats, seminars and allow reconfiguration for workshops, demonstrations, collaborative sessions, or practical exercises.
- **Electrical and Data Needs:**
Sufficient **power points** and **network connections** must be provided to accommodate equipment, digital learning tools, and practical work requirements.
- **Lighting:**
Adequate **LED lighting** must ensure clear, uniform visibility for all activities, with emergency lighting provided for safety.
- **Climate Control:**

Effective **air conditioning** (split AC units) must ensure thermal comfort, supporting prolonged periods of occupancy and activity.

- **Flooring:**
The flooring material must be:
 - **Anti-slip** for safety,
 - **Anti-static** to protect sensitive electronic equipment,

- **Durable and easy to maintain**, such as vinyl or epoxy surfaces suitable for workshop and multipurpose educational environments.
- **Technology Integration:**
The space must include provisions for **overhead projector mounting**, supporting presentations, digital demonstrations, and instructional sessions.
- **Accessibility and Safety:**
 - Clear, unobstructed movement paths.
 - Compliance with accessibility standards.
 - Emergency lighting for evacuation safety.

Note:

Detailed furniture, equipment, and storage requirements for this space are specified separately under the **Furniture Specification Section**.

3.5. Landscaping Requirements

Purpose:

Create a pleasant and practical outdoor space where students and staff can relax, socialize, and enjoy fresh air.



Key Features:

- Provide simple seating areas such as benches or picnic tables for rest and socializing.
- Include a small garden with greenery and flowers to brighten the space.
- Construct paved walkways with ramps for easy and accessible movement throughout the site.
- Ensure proper external drainage to prevent water pooling and maintain a dry, safe environment.
- Add shaded spots using trees or simple shade structures to enhance comfort and aesthetics.
- Install creative outdoor lighting along pathways and entrances to improve safety.
- Install institute name signage at the main entrance, designed creatively to reflect the character of the institute, and also ensure a formal nameplate is fixed on the building in compliance with national regulations and standard dimensions.

4. Major Components of Work (Design & Build – Prefab)

Component	Scope Description
Design & Engineering	<ul style="list-style-type: none">• Full Design & Build services: architectural, structural & MEP design (site layout, modular floor/roof plans, elevations, sections, 3D visuals)• Service coordination: stormwater, fire-safety, CCTV/security, ICT, HVAC, plumbing• Prefabrication detailing: panel/joint connection drawings, lifting diagrams, assembly procedures (see Section 2: Design Scope)
Preliminaries	<ul style="list-style-type: none">• Site survey & geotechnical investigation• Temporary works: fencing, site offices, welfare facilities• Mobilization of plant/equipment/labor, safety signage & PPE stations• Utilities coordination: temporary power, water, comms
Ground Works	<ul style="list-style-type: none">• Excavation, subgrade compaction, sand fill/backfill• Pile or strip foundation preparation with anchor plates• Installation of subsurface drainage & service ducts
Concrete Works	<ul style="list-style-type: none">• In-situ RC footings, plinth beams & base slabs with DPM• Anchor-bolt layout for module connections• Curing, testing & protection
Roofing	<ul style="list-style-type: none">• Prefab insulated sandwich panels (≥ 100 mm, $U \leq 0.35$ W/m²K) with flashings• Sloped profile, gutters, downpipes & safety anchors
Boundary Wall	<ul style="list-style-type: none">• Prefab steel-panel fence or aluminium section with cladding with reinforced masonry with finish• Security/pedestrian gates, signage panels & lighting posts
Main Entrance Gate	Sliding steel gate made from galvanized and powder-coated steel, with smooth-track mechanism and provision for manual or motorized operation including remote access
Flooring & Tiling	<ul style="list-style-type: none">• Hangar: epoxy resin, anti-slip & chemical resistant• Offices/Classrooms: vinyl or ceramic tiles• Toilets: non-slip floor tiles & wall tiling to 1.8 m
Doors & Windows	<ul style="list-style-type: none">• Powder-coated steel/aluminium doors with panic hardware & locksets (cylinder locks, mortise locks, deadbolts)• Door closers, hinges, handles, thresholds & weather seals• FRP/UPVC doors in wet areas with corrosion-resistant hardware• Aluminium-frame windows with safety glass, insect screens & locking mechanisms• Integrated ramps and accessible hardware for PWD access
Wood Work & Ceiling	<ul style="list-style-type: none">• Built-in joinery (reception, pantry, storage)• Exposed metal deck & purlins (no suspended ceiling)• Optional acoustic panels in Admin/Classrooms
Painting	<ul style="list-style-type: none">• Exterior: epoxy primer + polyurea topcoat (marine-grade)• Interior: washable emulsion; moisture-proof paint in toilets• Touch-up factory finishes
Metal Work	<ul style="list-style-type: none">• Galvanized steel frame, trusses, railings & gutters• Louvres, brackets & security grills
Hydraulics & Drainage	<ul style="list-style-type: none">• Hot/cold water distribution & sanitary piping to septic• Rainwater harvesting & disposal• Floor traps, gullies & grease traps

Electrical Installations	<ul style="list-style-type: none"> • MDB & sub-DBs with surge protection, MCBs/RCCBs • Power & lighting circuits in cable trays/conduits • LED fixtures, emergency lights & exit signage • Switchgear & Fixtures: wall-plate switches, socket outlets, isolators, dimmers, timer controls • Earthing/lighting protection, cable management trays • Optional backup power connections
Fixtures & Fittings	<ul style="list-style-type: none"> • All plumbing fixtures: WCs, basins, bidet sprays, faucets/taps (basin mixers, sensor/non-touch taps), shower heads, • Soap dispensers, towel rails, toilet paper holders • Fire-safety fittings: extinguishers, hose reels & alarms
Air Conditioning	<ul style="list-style-type: none"> • Supply, installation & commissioning of split-type AC units (as per spec) • Refrigerant piping, condensate drains & isolation supports • Programmable thermostats
Data & Security	<p>CAT6 structured cabling with labeled outlets, patch panels & rack installation. CCTV cameras, NVR/DVR, housings & PoE switch provisioning. All data-point cabling to be routed and terminated at the dedicated server/IT equipment rack in the Admin Office control area</p>
Firefighting System	<ul style="list-style-type: none"> • Portable extinguishers, hose reels & hydrant points • Fire-alarm detectors, manual call points & control panel • Emergency exit lights, signage & evacuation maps
Workshop Equipment & Machinery	<ul style="list-style-type: none"> • Supply, installation & commissioning of boatbuilding machinery: CNC routers, band saws, sanding stations, hydraulic presses, dust extraction units • Tool storage carts, workbenches & instructor stations (per Equipment Specification Sheet) • Testing, calibration & operator training. <p>Refer to Equipment Specification Sheet</p>
Furniture Supply & Install	<ul style="list-style-type: none"> • Classrooms, ICT lab & admin: desks, chairs, boards, lecterns • Workshop benches, storage units & tool trolleys • Reception counter, meeting tables & pantry seating. Refer to <u>Furniture Specification Sheet</u>
Landscaping	<ul style="list-style-type: none"> • Site grading, topsoil & turf placement • Paved walkways, ramps with tactile strips • Planting of native trees/shrubs & site furniture • External lighting & drainage channels

5. Material and Design Considerations

- **Building components must be prefabricated**, marine-grade, and salt-resistant
- Materials should support long-term durability with minimal maintenance
- Exterior to reflect **rustic/industrial look**, referencing airplane or boatbuilding hangars
- Modular construction to enable rapid deployment and scalability

Refer Technical Specification Documents for more details

6. Deliverables by Contractor

- Complete **design package**
 - Prefabricated modular building production and delivery
 - Site preparation and installation
 - Utility connection and testing
 - Interior fit-out, furniture, workshop items and commissioning
 - Final as-built drawings and Operation & Maintenance manuals
-

7. Bidder Submission Requirements

A high-level *Work Schedule and Planning for Deliverables* (Activity Schedule) shall be submitted at this stage. This must cover all key project components including:

- Architectural, structural, and MEP design
- Demolition and site preparation
- Prefabrication and installation of the modular building
- Utility connection and commissioning
- External works and landscaping
- Supply and installation of furniture and workshop equipment

*Note: The detailed Bill of Quantities (BoQ) is **not required** at this stage and shall be submitted by the successful bidder during the implementation stage.*