Urinal	10-sets Comfort Rooms	

XXIV.D. Septic Tank

a. Construction of two (2) sets of septic tanks (3x1.8m) is included in scope of work (see detail).
b. Use 4" Thick for septic tank walls and apply 20mm thick plastering for all internal surfaces.
c. Septic tank outlet shall be connected to the nearest campus drainage.
d. Provide solid vent pipe with vent cap extending 300 mm above top of mounds.
e. Install cleanouts and extension from piping to cleanout at grade as indicated. Use 4-inch-(100-mm-) PVC pipe with threaded PVC cap.
f. Apply cementitious waterproofing and 20mm plastering on inner faces and bottom floor of septic tanks.
g. Perform testing of completed septic tank system piping and structures according to authorities having jurisdiction. Fill underground structures with water and let stand overnight. If water level recedes, locate and repair leaks and retest. Repeat tests and repairs until there is no leakage.

XXIV.E. Catch Basin

a. Provide Thirty-one (10) sets of 0.60x0.60x0.695m catch basin with movable cover located as per plan (see detail).
b. Use 4" thick Apply 12mm thick plastering on inner faces and exposed surfaces of catch basin.
c. Storm drains shall be connected to nearest drainage with 1% slope.

PART E. ELECTRICAL WORKS

XXV. Electrical Works

All electrical works shall comply with the provisions of the Philippine Electrical Code (PEC) 2017 Edition with rules and regulations of the national and local authorities concerned in the enforcement of electrical laws and regulations of the utility companies concerned.

All electrical works shall be performed by a **Registered Master Electrician (RME)** or a non-licensed electrical practitioner under the immediate supervision of a **Registered Electrical Engineer (REE).**

1. The scope of work covers furnishing of all materials, labor, equipment, accessories, and all necessary services to complete the electrical system of the project as per plan and specifications.
2. Items, materials, and equipment not specifically mentioned in this scope or drawing but are necessary and critical for safety and efficient operation of the entire electrical system shall be deemed as included within this scope and shall be provided by the Contractor.
3. All materials & equipment shall be brand new and approved type for the purpose and location.
4. Upon completion of all works, the Contractor shall apply for the permanent electrical service connection of the building. Any additional fees required shall be charged to the contractor.
5. The Contractor shall verify site conditions and dimensions before ordering equipment or performing work to avoid conflicts and ensure compatibility before installation.
6. All materials & equipment shall be installed as per manufacturer's specifications and instructions.

XXX.A. *Conduits, Boxes, Fittings& Accessories*

a. Provision and installation of conduits, boxes, fittings and accessories.
b. All conduits shall be embedded on concrete where possible.
c. Conduits or raceways through which moisture may contact live parts shall be sealed or plugged at either or both ends.
d. Provide end bells for 32mmØ and larger conduits terminating on panelboards, boxes and gutters.
e. Provide long elbow for bends of conduit 32mmØ and larger.
f. Provision and installation of boxes, fittings and accessories for alloutlets, junction points and switch points.
g. Additional pull boxes shall be provided, if necessary, to facilitate wire pulling and for maintenance purposes and shall be installed in an inconspicuous location.
h. Pull boxes shall be accessible to the front.
i. Pull boxes installed outdoor shall be NEMA 3R type.

XXX.B. *Wires & Wiring Devices*

a. Provision and installation of electrical wirings such as, but not limited to, branch circuit conductors, switch wirings, feeder conductors, service entrance conductors, equipment grounding conductors as per plan.
b. All conductors of the same circuit and, where used, the grounded conductor and all equipment grounding conductors and bonding conductors shall be contained within the same raceway, auxiliary gutter, cable tray, cable bus assembly, trench, cable, or cord.
c. Provision and installation of wiring devices such asconvenience outlets, special purpose outlets, switches and receptacles.
d. Provide duplex convenience outlet for emergency lights.
e. All convenience outlets shall be 3 prong, universal type with ground.

XXX.C. *Panelboard and Circuit Breakers*

Provision and installation of panelboard& transfer switch:

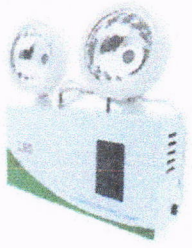
PANEL	CIRCUIT BREAKERS	ENCLOSURE / AUX.
MDP	Main: 1 – 100AT / 100AF, 2P, 240V 22KAIC bolt-on MCCB Branches: 6 – 15AT / 100AF, 2P 240V 22KAIC bolt-on MCCB 6 – 20AT / 100AF, 2P 240V 22KAIC bolt-on MCCB 6 – 30AT / 100AF, 2P 240V 22KAIC bolt-on MCCB	NEMA 1 with push lock nameplate and directory holder
Manual Transfer Switch (MTS)	Main: 2 – 100AT / 100AF, 2P, 240V 22KAIC bolt-on MCCB with mechanical interlock	NEMA 1

a. Panelboard shall have a grounding terminal bus with terminal lugs.
b. Use one brand of circuit breaker only all throughout.
c. The contractor shall furnish specification / data sheet of panelboards.
d. This scope also includes provision and installation of dedicated circuit breakers for ACU: 30AT, 2P, 240V, 60Hz MCCB in plastic enclosure.

XXX.D. *Lighting Fixtures*

a. This Item includes provision and installation of all lighting fixtures with the following specifications

SPECIFICATION	LOCATION / AREA	Required Quantity	FIXTURE
LED Bulb 9W, 230V, 6500K daylight, 900lmE27 base	As per plan	17 sets	

LED Bulb 19W 230V, 6500K daylight, 2300lm E27 base	As per plan	86 sets	
Twin head automatic emergency light, 2 x 1W LED, 230V, 6500K daylight	As per plan	6sets	

XXX.E. Metering

a. Provision and installation of one (1) Single phase Electronic Kilowatt-hour meter c/w meter base, seal in NEMA 3R enclosure.

XXX.F. Grounding System

a. Provision and installation of grounding system.
b. The grounding electrode shall be Copper bonded steel rod 20mmØ x 3m. The ground rod shall be flushed underground with a vertical orientation. Use clamp suitable for direct burial.
c. Ground resistance shall not exceed 25ohms. A single ground rod that does not have a resistance to ground of 25 ohms or less shall be augmented by one additional rod. Where multiple rods are installed to meet the requirements of the code (PEC), they shall not be less than 1.8m apart.
d. Non–current-carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment shall be grounded.
e. Grounding conductors and bonding jumpers shall be connected by listed pressure connectors or listed clamps. Connection devices or fittings that depend solely on solder shall not be used. Sheet metal screws shall not be used to connect grounding conductors or connection devices to enclosures.
f. Ground clamps or other fittings shall be protected from physical damage.