

- All restoration and rehabilitation works shall be done on the affected areas to the same features with the existing or as per the required finish.

Section 15700 Heating, Ventilating, & Air Conditioning Equipment

- Supply and installation of new air-conditioning units split ceiling cassette Inverter type, complete piping system with accessories such as remote control, supports and etc. ready for use as follows as follows:

- 1.0TR, 1.5TR, 2.0TR and 2.5TR outdoor unit split type matched with 1.0TR
- 1.5TR, 2.0TR and 2.5TR, wall mounted and 4-way cassette indoor unit respectively.

VENTILLATION / EXHAUST FAN

- Ceiling mounted toilet exhaust fan 10" with 8" pvc round duct and 4" stainless vent cap.
- Ceiling Cassette Flush Mounted Ventilation Fan with Remote Control A-SCF350-14", 65 watts, 240V, 2400CBM/h, Noise – 48Db, mounting size: 60mmx60mm.
Flush mounted

EXHAUST SYSTEM

Centrifugal SISW backward curved fan

Exhaust Fans: 4F - 1; 2250CMH @ 375 Pa TSP 1.12KW
 4F - 2; 1700CMH @ 375 Pa TSP 0.746KW
 RD - 1; 2250CMH @ 375 Pa TSP 1.12KW
 RD - 2; 1700CMH @ 375 Pa TSP 0.746KW

G.I SHEET METAL DUCT (incl. elbows, fittings, etc.)

- Ga #26
- Ga #24

EXHAUST PLENUMS

- Perforated exhaust plenum box

GRILLES and DIFFUSERS 1000x200 FAG

HANGERS and SUPPORTS

Division 16 - Electrical

Workmanship and Materials

- All works shall be done in accordance with the requirements of the latest edition of the Philippine Electrical Code and National Safety Code. Nothing contained in these specifications or shown on the plan shall conflict with the requirements of these Codes, any discrepancies should be consulted to the Project Inspector / Electrical Engineer.
- All materials and equipment to be used and installed hereunder shall be of the approved type bearing the stamp or approval of the proper authorities concerned. Locally made or constructed materials shall first be approved before installation.

- All works shall be done in workmanlike manner and should present a neat and mechanical appearance when completed.

Plans

- The accompanying drawings shall indicate the general arrangement of the equipment, outlets and other works. When it is necessary to deviate from the arrangement indicated on plans in order to meet the structural conditions, such deviation shall be made at the expense of the Contractor and upon approval from the Project Inspector / Electrical Engineer.
- The outlets and circuit breakers shown on the plan are diagrammatic and approximately correct as to location. Minor changes shall be made through the Contractor at his own expense. The exact location of all outlets and switches shall be determined by the Project Inspector/Electrical Engineer and the same shall be located accordingly. The Contractor shall be responsible for the accurate location of all outlets with respect to doors, partitions, water pipes, cabinets and other facilities.

16050 Basic Electrical Materials and Methods

Conduit System

- PVC Conduit pipes is primarily required for this work. Conduit runs shall be well supported especially on ceiling and slab, concrete encased on soil. All conduits placed on walls and partition shall be embedded, exposed layout will not be allowed. Conduit ends shall be provided with an end bell or adapter with locknut and bushing. Conduit shall enter knockouts squarely. Locknuts and bushing shall be used at termination of conduits in outlets, pull or junction boxes, panels and cabinets. Locknuts shall be screwed tight. Bends and offsets shall be avoided if possible, but when necessary it shall be made with an approved Field bend or pipe / conduit bending machine. The use of pipe tee or vice bending conduits will not be permitted.

Restrictions

- Supply and installation of all material not shown in the drawing nor mentioned in this specification but necessary for the completion of the construction works shall be included. Coordination with CPDMO and Project Inspector should be done for proper installation of all wiring systems.

16070 Hangers and Supports

Hangers and Support

- All electrical pipes and accessories shall be using appropriate hangers and support follow existing features. Exposed layout on walls and partition inside offices shall not be allowed. Chipping works required.

16080 Testing

Testing of system

- Complete testing of the system involved in operation and provision of all system apparatus for making test and guarantee for a period of one (1) year after acceptance of the project and shall agree to repair and make good at no additional cost to the end user.

16090 Restoration and Repair

Restoration Works

- All the necessary restoration works in all affected areas in the implementation of the project shall be the Contractors liability.

16120 Conductors and Cables

- Wires and cable for lights and power shall be type THHN/THW 600 volts insulation approved type building wire. No. 3.5 mm THHN shall be used from the panel board to the last outlet, and shall be the smallest wire that should be used, unless otherwise No. 8.0mm wires THHN and larger shall be stranded and be connected to the panel boards and equipment by solder less connectors sufficiently large to enclose all strands of the conductor and be securely fastened. They shall not get loose under vibration and normal strain. Wire splices shall be mechanically and electrically secured and soldered. Joints taps and splices in wires larger than No. 10 AWG shall be made with the use of solder less connectors. They shall be tapped with electrical tape to the thickness of the wire insulation.
- Wires and cables shall be continued from outlet, or outlet to pull boxes without splices. Conductors shall not be drawn in conduits until plaster is dry and the conduits are cleaned and free of moisture. Conductors of other systems shall not occupy the same conduit and boxes used for light and power.

Scope of Works (Submit sample materials for approval)

- Complete supply and installation of wires and cable shall be included in this scope of works.
- Tagging of all switches, convenience outlet and ECB's of ACU units corresponding to the branch circuit number as indicated on the respective panel board's directory using tagging machine.
- Balancing of loads
- Wires must be color coded using the standard color coding
Line - Red Line - Yellow
Line - Blue Ground - Green

16130 Raceway and Boxes

Boxes and Pull boxes

- All conduit boxes and fittings shall be standard manufactured by reputable electrical manufacturers. All conduit boxes not over 100 cubic inches in size, if constructed of sheet metal, the metal shall not be less than No.14 US gauge and shall be set flush with the surface of the structure in which they are installed and where conduit runs are concealed. Care shall be exercised to line up all outlet boxes, 4" octagon type and 1-½" depth. When more than two conduits enter the outlet box, the 2-1/8" depth type box shall be removed. All outlet boxes indicated to be used for lighting fixtures shall be provided with standard flat metal covers.

- Horizontal or vertical gang boxes shall be installed as indicated or when required. All conduit boxes, junction boxes, and blank outlet boxes shall be fitted with standard flat metal conduit box covers.

16140 Wiring Devices

Wiring Devices

- All wiring devices to be used hereunder shall be new and of approved type. All wall switches shall be top-action quiet-matic type, wide series, bases to be fire-resistant and non-absorptive material. When more than one switches is indicated in the same location, they shall be mounted in gang under a common plate.
- Convenience outlet shall be duplex-type, universal & flush-type with fire-resistant non-absorptive bases, minimum rating of 16 amperes at 250 volts wide series" ROYU".
- Suitable single pole and heavy-duty switches shall be installed where indicated on the plans. Sample of wiring devices shall be presented for approval. Minor relocations and re-circuiting shall be the liability of the Contractor.
- Following features shall be followed: one gang, one way switch, 2 gang, one way switch, 3 gang, one way switch, one gang three way switch, two gang three way switch, three gang three way switch, duplex flush type convenience outlet universal grounding type.

16580 Lighting Fixtures (Submit sample materials for approval)

Lighting Fixtures and TV

6" Ø recessed mounted LED downlight 12 watts daylight including LED driver wide beam angle.

1200mmx300mm GL988) troffer recessed mounted fluorescent fixture with louver or reflector type with 2-12watts T5 LED tube 1200mm.

Emergency light 2-1.5W LED (22hrs)

LED SMART TV 65" and installation cost

16410 Low Voltage Switchgear, Main Distribution Panel, Panel Boards, Enclosed switches and Circuit Breakers

Low Voltage Switchgear 2 vertical section (swing dead front cover) in NEMA 1 enclosure, main @ 1600AT MCCB rated, 3P 65kaic 240V/480V fixed type/manual with micrologic

Metering:

Powerlogic Digital Power Meter, Aux. Supply 240VAC, w/ basic metering plus AN RS485 Port for MODBUS PM1200

Current transformer, Ring Type, Ratio 1600:5A, 15VA, 660V, CI-R71600

Miniature CB Rated AT 6A, 3P, 20KA @ 240V, iC60N, A9F74306

Terminal Block, 12 PTS, 25A TB25

Branches: 11 MCCB

Rated at 500AT, 3P, 70KA @ 240V, CVS630N3500P

Rated at 225AT, 3P, 25KA @ 240V, EZC250F3225P

Rated at 200AT, 3P, 25KA @ 240V, Ezc250F3200P
Rated at 175/200AT, 3P, 25KA @ 240V, Ezc250F3200P
Rated at 160AT, 3P, 25KA @ 240V, Ezc250F3160P
Rated at 125AT, 3P, 25KA @ 240V, Ezc250F3125P
Rated at 100AT, 3P, 25KA @ 240V, Ezc100F3100P

Distribution Panel (DP) – Main Breaker and branches MCCB, Surface mount with swinging dead front in NEMA 1 enclosure powder coated enamel finished, grounding busbars and terminal.

DPG - Rated at 125AT, 3P, 25KA @ 240V, Ezc250F3125P

Branches: 2

Rated at 100AT, 3P, 25KA @ 240V, Ezc100F3100P
Rated at 75AT, 3P, 25KA @ 240V, Ezc100F3075P

DP2F - Rated at 100AT, 3P, 25KA @ 240V, Ezc100F3100P

Branches: 2

Rated at 75AT, 3P, 25KA @ 240V, Ezc100F3075P
Rated at 50AT, 3P, 25KA @ 240V, Ezc100F3050

DP3F - Rated at 125AT, 3P, 25KA @ 240V, Ezc250F3125P

Branches: 2

Rated at 75AT, 3P, 25KA @ 240V, Ezc100F3075P
Rated at 100AT, 3P, 25KA @ 240V, Ezc100F3100P

DP4F - MCCB Rated at 175AT, 3P, 25KA @ 240V, Ezc250F3200P

Branches: 2

Rated at 75AT, 3P, 25KA @ 240V, Ezc100F3075P
Rated at 100AT, 3P, 25KA @ 240V, Ezc100F3100P

DPD - MCCB Rated at 175AT, 3P, 25KA @ 240V, Ezc250F3200P

Branches: 3

Rated at 125AT, 3P, 25KA @ 240V, Ezc250F3125P
Rated at 100AT, 3P, 25KA @ 240V, Ezc100F3100P

Panel Boards – Main MCCB and branches miniature (bolt on type) Surface mount with swinging dead front in NEMA 1 enclosure powder coated enamel finished, grounding busbars and terminal.

PBGF - MCCB Rated at 75AT, 3P, 25KA @ 240V, Ezc100F3075P

Branches: 14

Miniature CB Rated at 20AT, 2P, 20KA @ 240V, iC60N A9F74220
Miniature CB Rated at 16AT, 2P, 20KA @ 240V, iC60N A9F74216

PB2F - MCCB Rated at 50AT, 3P, 25KA @ 240V, Ezc100F3050

Branches: 11

Miniature CB Rated at 20AT, 2P, 20KA @ 240V, iC60N A9F74220
Miniature CB Rated at 16AT, 2P, 20KA @ 240V, iC60N A9F74216

PB3F - MCCB Rated at 75AT, 3P, 25KA @ 240V, Ezc100F3075P

Branches: 12

Miniature CB Rated at 20AT, 2P, 20KA @ 240V, iC60N A9F74220
Miniature CB Rated at 16AT, 2P, 20KA @ 240V, iC60N A9F74216

PB4F - MCCB Rated at 75AT, 3P, 25KA @ 240V, EZC100F3075P

Branches: 19

Miniature CB Rated at 20AT, 2P, 20KA @ 240V, iC60N A9F74220
Miniature CB Rated at 16AT, 2P, 20KA @ 240V, iC60N A9F74216

PBD - MCCB Rated at 100AT, 3P, 25KA @ 240V, EZC100F3100P

Branches: 16

Miniature CB Rated at 20AT, 2P, 20KA @ 240V, iC60N A9F74220
Miniature CB Rated at 16AT, 2P, 20KA @ 240V, iC60N A9F74216

PBEF4F - MCCB Rated at 100AT, 3P, 25KA @ 240V, EZC100F3100P

Branches: 9

Miniature CB Rated at 20AT, 2P, 20KA @ 240V, iC60N A9F74220
Miniature CB Rated at 32AT, 2P, 20KA @ 240V, iC60N A9F74232

PBEFD - MCCB Rated at 100AT, 3P, 25KA @ 240V, EZC100F3100P

Branches: 12

Miniature CB Rated at 20AT, 2P, 20KA @ 240V, iC60N A9F74220
Miniature CB Rated at 32AT, 2P, 20KA @ 240V, iC60N A9F74232

PBACG - MCCB Rated at 100AT, 3P, 25KA @ 240V, EZC100F3100P

Branches: 11

Miniature CB Rated at 32AT, 2P, 20KA @ 240V, iC60N A9F74232

PBAC2F - MCCB Rated at 75AT, 3P, 25KA @ 240V, EZC100F3075P

Branches: 8

Miniature CB Rated at 32AT, 2P, 20KA @ 240V, iC60N A9F74232
Miniature CB Rated at 20AT, 2P, 20KA @ 240V, iC60N A9F74220

PBAC3F - MCCB Rated at 75AT, 3P, 25KA @ 240V, EZC100F3075P

Branches: 12

Miniature CB Rated at 32AT, 2P, 20KA @ 240V, iC60N A9F74232

PBAC4F - MCCB Rated at 100AT, 3P, 25KA @ 240V, EZC100F3100P

Branches: 12

MCCB Rated at 32AT, 2P, 20KA @ 240V, iC60N A9F74232

PBACD - MCCB Rated at 125AT, 3P, 25KA @ 240V, EZC250F3125P

Branches: 13

Miniature CB Rated at 32AT, 2P, 20KA @ 240V, iC60N A9F74232

Enclosed Circuit Breakers (MCCB/ECB)

MCCB 1600AT 3P 230V in NEMA 3R enclosure with grounding terminals NS1600N
ECB20 - Wall Mounted NEMA 1 enclosure (Outside Toggle) 1Ø, 2W, 240V, 60Hz and
grounding terminal Miniature CB Rated at 32AT 2P 20KA @ 240V iC60N A9F74220
ECB30 - Wall Mounted NEMA 1 enclosure (Outside Toggle) 1Ø, 2W, 240V, 60Hz and
grounding terminal Miniature CB Rated at 32AT 2P 20KA @ 240V iC60N A9F74232

ECB20 - Wall Mounted NEMA 3R enclosure (Swing Up cover) 1Ø, 2W, 240V, 60Hz and grounding terminal Miniature CB Rated at 32AT 2P 20KA @ 240V iC60N A9F74220

ECB30 - Wall Mounted NEMA 3R enclosure (Outside Toggle) 1Ø, 2W, 240V, 60Hz and grounding terminal Miniature CB Rated at 32AT 2P 20KA @ 240V iC60N A9F74232

- The enclosure shall be galvanized steel of code thickness, powdered coated enamel finish and shall be installed plumb and symmetrical with the surrounding devices.
- 2" x 4", 4" x 4" PVC utility and junction boxes Pull box with cover enamel coated finished with ½ and ¾ knock outs.
- Electrical tapes, rubber tapes, pull wires, mica tubes and assorted screws

16700 Communications

Structured Cabling System

- Category6 UTP, 4 pairs, unshielded twisted pairs, polyethylene insulated hyper grade non-plenum LAN cable is the general requirements for this structured cabling system, The height of the data outlets is 90cm above finish floor line.
- Supply and installation of complete wiring devices, 2 meters patch cords information data outlet 8 pin CAT6, RJ45 snap in jacks and other accessories ready for use.
- Supply and installation of Intermediate Data Frame Cabinet with two (2) exhaust fan and patch panel, termination and commissioning is included in this scope of work.
- Complete termination and testing of cables, tagging (using tagging machine), labeling of each terminal for easy identification. Submission of test results shall be required.
- Supply and installation of Telephone Terminal Cabinet (TTC) and termination of UTP cable for telephone at the TTC with corresponding tagging and tested

Conduit Pipes and Accessories

- 20mm dia. PVC pipes, couplings, PVC elbows, male adapter, coupling, locknut and bushing.
- 2" x 4", 4" x 4" PVC utility and junction boxes
- Pull box with cover enamel coated finished with ½ and ¾ knock outs.
- Electrical tapes Pull wires, mica tubes and assorted screws

16720 Structured Cabling

Supply and installation of Intermediate Distribution Frame 3' with 2-exhaust fan, 2- 24 port patch panel coupler type, CAT6e cable, 1- meter patch cord complete

.NOTE

The foregoing list of item of works does not in any way limit the responsibility of the Contractor to perform all other works necessary for the completion of the project, **RENOVATION OF GUSALING ANDRES BONIFACIO.**


GUARANTEE

The Contractor shall guarantee all works under this contract to be free from any technical, material, workmanship and/or factory defects and shall replace and repair to the satisfaction of the Project Architect / Engineer and/or to the Chief of CPDMO on any part or portion of the work which may fail within **a period of one (1) year after the final acceptance of the system.**


COMPLETION PERIOD

The Contractor is given **Two Hundred Eighty (280) calendar days** to execute the renovation works including the installation all system requirements. The Contractor shall coordinate to the CPDMO Inspector and End-users for the schedule of testing of systems and other related job.

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