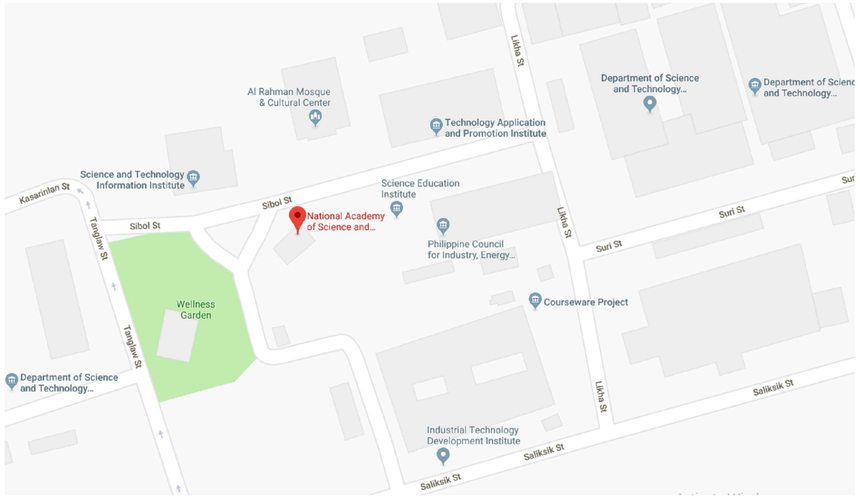
DRAWING INDEX:

SHEET NO.	DESCRIPTION
E1.0	SYMBOL LISTS, NOTES, ABBREVIATIONS, AND INDEX
E2.0	HVAC LAYOUT PLAN
E3.0	SINGLE LINE DIAGRAM AND PANEL SCHEDULES
E4.0	SPECIFICATIONS

SCOPE OF WORK

1. INSTALLATION OF HVAC AND GENERATOR SET FOR THE PHILIPPINE SCIENCE HERITAGE CENTER NATIONAL ACADEMY OF SCIENCE AND TECHNOLOGY, 2/F SCIENCE HERITAGE CENTER, DOST COMP. BICUTAN TAGUIG CITY, METRO MANILA

VICINITY MAP



SYMBOLS: (ALL SYMBOLS MAY OR MAY NOT BE USED)

CONDUIT

- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUIT RUNNING UP & DOWN
- LV — LOW VOLTAGE MULTI-CONDUCTOR CABLE – PLENUM RATED WHERE REQUIRED, NOT INSTALLED IN CONDUIT.
- CONDUIT – CONCEALED IN WALLS OR CEILING IF POSSIBLE, 1/2" WITH (2) #12 THHN/THWN Cu & (1) #12 THHN/THWN Cu GROUND U.O.N.
- CONDUIT – IN OR BELOW FLOOR, 3/4" WITH (2) #12 THHN/THWN Cu & (1) #12 THHN/THWN Cu GROUND U.O.N.
- CONDUIT – EXPOSED, 1/2" WITH (2) #12 THHN/THWN Cu & (1) #12 THHN/THWN Cu GROUND U.O.N.
- TYPE MC CABLE 3/C #12 WITH GND (MINIMUM NUMBER OF CONDUCTOR AND WIRE SIZE)
- UG — CONDUIT INSTALLED UNDERGROUND
- HASH MARK IDENTIFICATION
- EQUIPMENT GROUND CONDUCTOR
- ISOLATED GROUND CONDUCTOR (WHERE USED)
- NEUTRAL CONDUCTOR
- #10 — CONDUIT – HOME RUN TO PANEL, TERMINAL CABINET, ETC., HASH MARKS INDICATE NUMBER OF WIRES. "#10" INDICATES WIRE SIZE. SIZE CONDUIT PER CODE U.O.N.
- FLEX CONDUIT WITH CONNECTION.

MISC.

- AC–1 — EQUIPMENT TAG
- 1 — SHEET NOTE SYMBOL
- 1 — GENERAL NOTE SYMBOL
- A/2 — FIXTURE TAG, NUMBER INDICATED QUANTITY OF FIXTURES
- 1 — REVISION REFERENCE SYMBOL – SEE ASSOCIATED REVISION NOTE.
- F1 — FEEDER DESIGNATION

SINGLE LINE

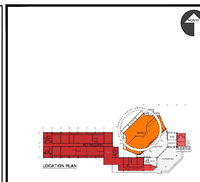
- 150/100 (3) — MOLDED CASE CIRCUIT BREAKER, "100" EQUALS TRIP RATING, "3" INDICATES NUMBER OF POLES, "150" EQUALS FRAME SIZE.
- ENCLOSED MOLDED CASE CIRCUIT BREAKER, "100" EQUALS TRIP RATING,
- 100A/3P — "3P" INDICATES NUMBER OF POLES.
- DRAWOUT INSULATED CASE OR AIR CIRCUIT BREAKER WITH INDICATIONS ABOVE.
- GF — TP — EQUIPMENT GROUND FAULT DETECTION WITH TEST/MONITOR PANEL.
- 100/70 (3) — FUSED SWITCH, CLASS L OR R FUSES AS NOTED. "100" INDICATES SWITCH SIZE, "70" INDICATES FUSE SIZE, "3" INDICATES POLES.
- TRANSFORMER, 2 WINDING
  - △ – DELTA
  - Y – WYE
  - Y – WYE GROUNDED NEUTRAL
- (M) — UTILITY KWH METER
- 100/3 — PANELBOARD, SIZE AS NOTED, MAIN LUGS ONLY UNLESS MAIN BREAKER SHOWN, "100/3" INDICATES MAIN BREAKER SIZE.
- MCP, 2, OL — COMBINATION STARTER, "2" INDICATES STANDARD NEMA SIZE WITH CPT, HOA AND 3 OVERLOADS U.O.N.

ABBREVIATIONS:

AFF	ABOVE FINISHED FLOOR	GEN	GENERATOR	PB	PULL BOX
AL	ALUMINUM CONDUCTOR OR BUS	GFI	GROUND FAULT INTERRUPTER	PE	PHOTO ELECTRIC CELL
AM	AMMETER	GND	GROUND	PNL	PANEL
ANN	ANNUNCIATING			PR	PAIR
ART	ARTICLE	HGT	HEIGHT		
AUTO	AUTOMATIC	HP	HORSE POWER	QTY	QUANTITY
AUX	AUXILIARY	HPS	HIGH PRESSURE SODIUM		
AWG	AMERICAN WIRE GAGE	HTR	HEATER	R	REMOVE OR RELOCATE
		HW	HOT WATER	REC	RECEPTACLE
BD	BOARD			RECEPT	RECEPTACLE
BKBD	BACK BOARD	IG	ISOLATED GROUND	REF	REFRIGERATOR; REFERENCE
BKR	BREAKER	INCAND	INCANDESCENT	REQ'D	REQUIRED
BTM	BOTTOM			RL	RELOCATED
		JB	JUNCTION BOX		
CAB	CABINET			SCHED	SCHEDULE
CB	CIRCUIT BREAKER	KV	KILOVOLT	SECT	SECTION
CCTV	CLOSED CIRCUIT TELEVISION	KVA	KILOVOLT AMPERE	SIM	SIMILAR
CKT	CIRCUIT	KW	KILOWATT	SQ	SQUARE
CO	CONDUIT ONLY			SW	SWITCH
CU	COPPER CONDUCTOR OR BUS	LT	LIGHT	SWBD	SWITCHBOARD
		LTG	LIGHTING	SWGR	SWITCHGEAR
DD	DUCT DETECTOR			SYS	SYSTEM
DIA	DIAMETER	MAX	MAXIMUM		
DIM	DIMENSION	MCB	MAIN CIRCUIT BREAKER	TBD	TO BE DETERMINED
DISC	DISCONNECT	MCC	MOTOR CONTROL CENTER	TC	TIME CLOCK
DN	DOWN	MCM	MILLI CIRCULAR MILS	TEL	TELEPHONE
DS	DISCONNECT SWITCH	MIN	MINIMUM	TEMP	TEMPORARY; TEMPERATURE
		MISC	MISCELLANEOUS	TI	TENANT IMPROVEMENT
(E)	EXISTING	MLO	MAIN LUG ONLY	TRANS	TRANSFORMER
(ER)	EXISTING TO REMAIN	MTD	MOUNTED	TTB	TELEPHONE TERMINAL BACKBOARD
EA	EACH	MTG	MOUNTING	TV	TELEVISION
EM	EMERGENCY	MTR	MOTOR	TYP	TYPICAL
EQ	EQUAL				
EQUIP	EQUIPMENT	N	NORTH	UC	UNDER CABINET
EX	EXPLOSION PROOF	NC	NORMALLY CLOSED	UG	UNDERGROUND
EXH	EXHAUST	NEC	NATIONAL ELECTRIC CODE	UL	UNDERWRITERS LABORATORY
		NEUT	NEUTRAL	UON	UNLESS OTHERWISE NOTED
FA	FIRE ALARM	NIC	NOT IN CONTRACT	V	VOLT
FAAP	FIRE ALARM ANNUNCIATING PANEL	NO	NORMALLY OPEN	W	WALL MOUNTED; WATT
FACP	FIRE ALARM CONTROL PANEL	NTS	NOT TO SCALE	W/	WITH
FBO	FURNISHED BY OTHERS			W/O	WITH OUT
FIN	FINISH	OL	OVERLOAD	WP	WEATHER PROOF
FLA	FULL LOAD AMPS	OCS	OCCUPANCY SENSOR	XFMR	TRANSFORMER
FSD	FIRE SMOKE DAMPER				
FUT	FUTURE				

CONSTRUCTION NOTES:

1. ALL WIRE TO BE THHN/THWN COPPER, STRANDED EXCEPT WHERE NOTED OTHERWISE.
2. ALL DEVICES AND EQUIPMENT INSTALLED OUTDOORS OR EXPOSED TO THE WEATHER SHALL BE OF WEATHERPROOF CONSTRUCTION.
3. ALL DEVICES SHALL BE SPECIFICATION GRADE IN COMMON AREAS. ALL SINGLE AND GANGED PLATES SHALL BE THERMOPLASTIC AND SHALL BE MATCH THE DEVICE IN COLOR. COORDINATE DEVICE COLOR WITH THE ARCHITECT PRIOR TO INSTALLATION. GANG DEVICES AT GROUP LOCATIONS UNDER A SINGLE COVER PLATE.
4. THE ELECTRICAL PLANS ARE SCHEMATIC IN NATURE AND ARE NOT INTENDED TO SHOW ALL OF THE ARCHITECTURAL DETAIL OR SPECIFICS OF ELECTRICAL CONSTRUCTION. TAKE ALL DIMENSIONS FROM THE ARCHITECTURAL DRAWINGS.
5. REFER TO THE LATEST EDITION OF THE NEC2017, PEC2017, AND LOCAL ORDINANCES IN EFFECT AT THE TIME OF CONSTRUCTION AS THE CONTROLLING DOCUMENTS.
6. ALL CONNECTIONS TO MECHANICAL EQUIPMENT SHALL BE MADE WITH A MINIMUM OF 24" OF WEATHERPROOF FLEXIBLE CONDUIT TO PREVENT SOUND AND VIBRATION TRANSMISSION TO THE STRUCTURE.
7. COORDINATE ALL MOTOR OVERLOADS AND/OR FUSES FURNISHED BY THIS CONTRACT WITH THE ACTUAL EQUIPMENT INSTALLED. SIZE OVERLOADS BASED ON MOTOR NAMEPLATE FULL LOAD CURRENT AND SERVICE FACTOR. FUSES FOR MOTOR AND TRANSFORMER CIRCUITS SHALL BE DUAL ELEMENT. FUSES FOR OTHER "NON-INRUSH" LOADS SHALL BE FAST ACTING. ALL FUSES SHALL BE CURRENT LIMITING CLASS RK5 OR CLASS L UNLESS OTHERWISE NOTED.
8. GROUNDING CONDUCTORS ARE GENERALLY NOT SHOWN. GROUND AND BOND ALL EQUIPMENT, RACEWAYS, MOTORS, PANELBOARDS AND SWITCHBOARDS, ETC. IN ACCORDANCE WITH NEC ARTICLE 250.
9. BONDING OF ALL INTERIOR METAL PIPING SHALL BE IN ACCORDANCE WITH ARTICLE 250-104 AS FOLLOWS:
   A. ALL INTERIOR METAL WATER PIPING SHALL BE BONDED TO ONE OR MORE GROUNDING ELECTRODES USED. THE BONDING JUMPING SHALL BE SIZED IN ACCORDANCE WITH TABLE 250-66.
   B. INTERIOR METAL PIPING THAT MAY BECOME ENERGIZED (i.e. COLD WATER PIPING, ETC.), SHALL BE BONDED TO ONE OR MORE GROUNDING ELECTRODES USED. THE BONDING JUMPER SHALL BE SIZED IN ACCORDANCE WITH TABLE 250-66, USING THE RATING OF THE CIRCUIT THAT MAY ENERGIZE THE PIPING.
10. THE PHASE COLOR CODING OF THE INSULATION OF THE CONDUCTORS SHALL BE:
    a) RED-YELLOW-BLUE FOR 400/230V. 3 PHASE.
    a) RED-BLUE FOR 230V. 1 PHASE
11. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2009 PHILIPPINE ELECTRICAL CODE.
12. FOR EXISTING CONDITIONS / ELECTRICAL EQUIPMENTS:
    a. EC TO VERIFY EXISTING GROUNDING SYSTEM. GROUND RESISTANCE SHALL BE 25 OHMS OR LESS MEASURED BY THREE-POINT METHOD.
    b. EC SHALL FIELD VERIFY THE SIZE/RATING OF ALL ELECTRICAL EQUIPMENTS AND COMPARE WITH THE DRAWINGS. ANY DISCREPANCY FOUND BETWEEN THE DRAWINGS AND ACTUAL INSTALLATION SHOULD BE IMMEDIATELY REPORTED TO THE ENGINEER UNDERSIGNED BEFORE TURNING ON THE SERVICE.
    c. EC SHALL FIELD VERIFY EXISTING FEEDER CONDUCTORS' SIZE AND INSULATION RESISTANCE. REPLACE IF NECESSARY.
    d. TEST ALL EXISTING CIRCUIT BREAKERS TO BE REUSED. EC TO MAKE SURE ALL EQUIPMENTS TO BE REUSED ARE OPERATIONAL.
    e. EC SHALL VERIFY PANELBOARD ACTUAL RATING AND LOADING SHOWN. REVISE AS REQUIRED AND SUBMIT TO THE ENGINEER BEFORE RE-ENERGIZATION.
    f. ELECTRICAL CONTRACTOR SHALL VERIFY (E) FIELD CONDITIONS PRIOR TO BID. ANY DISCREPANCIES BETWEEN DRAWINGS FOUND DURING INSTALLATION SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION & SHOULD BE RESOLVED AT NO ADDITIONAL COST TO THE OWNER.



KEY PLAN :

NOTES:

PROFESSIONAL ELECTRICAL ENGINEER

PRC NO :
VALID UNTIL :
TIN :
PTR :
DATE :
PLACE :

REFERENCES

DWG. No.	REV.	DESCRIPTION

REVISION

No.	DATE	DESCRIPTION	CHECKED BY
01	15-05-2019	FOR APPROVAL	DOST
01	15-05-2019	FOR APPROVAL	GSCS

COORDINATION

	ARCH'L	CIVIL	ELECL	MECH'L	STRUC	SURVEY
DOST						
GSCS						

DESIGN DRAWING

CLIENT :

DOST NAST

PROJECT CONSULTANT :

GSCS Since 2016

PROJECT LOCATION :
NATIONAL ACADEMY OF SCIENCE AND TECHNOLOGY, 2/F PHILIPPINE SCIENCE HERITAGE CENTER, DOST COMPOUND BICUTAN, TAGUIG, METRO MANILA.

PROJECT TITLE :
MECHANICAL AND ELECTRICAL DESIGN FOR THE INSTALLATION OF HVAC AND GENERATOR SET AT THE PHIL SCIENCE HERITAGE CENTER

DRAWING TITLE : Symbols, List, Abbreviations, Vicinity Map & Index

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