

LEGEND

S.#	SYMBOL	DESCRIPTION
1		415 VOLTS, 50Hz 3 PHASE DIESEL GENERATOR.
2		MANUAL CHANGE OVER (MCO)
3		MAIN PANEL BOARD (MPB) OR SUB MAIN PANEL BOARD (SMPB)
4		DISTRIBUTION BOARD (DB) 'LDB' - LIGHTING DISTRIBUTION BOARD, 'PDB' - POWER DISTRIBUTION BOARD 'E' - INDICATES FOR POWER SUPPLY FROM EMERGENCY SOURCE 'U' - INDICATES FOR POWER SUPPLY FROM UPS SOURCE
5		UNINTERRUPTED POWER SUPPLY (UPS)
6		TRIPLE POLE, 500 VOLTS, MOULDED CASE CIRCUIT BREAKER (RUPURING CAPACITY INDICATED ON THE DRAWINGS) Adj.-INDICATES ADJUSTABLE TYPE
7		SINGLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RUPURING CAPACITY INDICATED ON THE DRAWINGS)
8		DOUBLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RUPURING CAPACITY INDICATED ON THE DRAWINGS)
9		TRIPLE POLE, 500 VOLTS, MINIATURE CIRCUIT BREAKER (RUPURING CAPACITY AND RATING INDICATED ON THE DRAWINGS)
10		VSS - VOLTMETER SELECTOR SWITCH (7-POSITION)
11		AC VOLTMETER (MEASURING RANGE INDICATED ON DRAWING)
12		AMMETER SELECTOR SWITCH (4-POSITION)
13		AC AMMETER (MEASURING RANGE INDICATED ON DRAWING)
14		AUTO-OFF-MANUAL SELECTOR SWITCH
15		ON-OFF PUSH BUTTON 1P/R1 INDICATES 1 NO. PUSH BUTTON FED FROM CIRCUIT NO. 1 OF RED PHASE
16		PHASE INDICATION LAMPS R - RED Y - YELLOW B - BLUE
17		10A LIGHT CONTROL GANG SWITCH WITH DIMMER, '3S' INDICATES 3 Nos. SWITCH, '2DM' INDICATES 2 Nos. FAN DIMMER + 2 Nos. SWITCHES & 'R1' INDICATES CIRCUIT NO.1 FROM 'RED' PHASE
18		10A LIGHT CONTROL 2 WAY SWITCH, '2ST' INDICATES FOR 2 Nos. TWO WAY SWITCH, & 'R1' INDICATES CIRCUIT NO.1 FROM 'RED' PHASE
19		13 AMPS, 250 VOLTS, 3 PIN UNIVERSAL, SWITCH SOCKET OUTLET 'TV' - INDICATES "TELEVISION"
20		13 AMPS, 250 VOLTS, SPUR OUTLET (SUPPLIED FROM UPS) DC - INDICATES "DOOR CONTROLLER" CCTV-INDICATES "CLOSED CIRCUIT TELEVISION" WAP - INDICATED " WIRELESS ACCESS POINT"
21		15 AMPS, 250 VOLTS, 3 PIN, SWITCH SOCKET OUTLET WP - INDICATES "WATER PUMPS"
22		20 AMPS, 250 VOLTS, DP SWITCH WITH NEON INDICATION EWH-INDICATES "ELECTRIC WATER HEATER" HD-INDICATES "HAND DRYER"
24		13A SHAVR SOCKET
25		EARTH CABLE/EARTHING LEAD/EARTH CONTINUITY CONDUCTOR (ECC) FOR EARTHING SYSTEM
26		EARTH CONNECTING POINT (ECP)
27		ROD TYPE EARTH ELECTRODE
28		PLATE TYPE EARTH ELECTRODE
29		RCC HANDHOLE

GENERAL NOTES

- FOLLOWING NOTES SHALL IN GENERAL APPLY TO ALL ELECTRICAL DRAWINGS. THE INSTRUCTIONS IN THESE NOTES SHALL BE FOLLOWED UNLESS STATED OTHERWISE.
- THESE NOTES SHALL BE APPLICABLE TO THE ENTIRE ELECTRICAL WORKS. IF THE SITE CONDITIONS NECESSITATE ANY ALTERATIONS OR DEVIATIONS THE DIRECTIONS OF THE ENGINEER SHALL BE OBSERVED AS FINAL INSTRUCTIONS.
- ALL ELECTRICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH BOQ, TECHNICAL SPECIFICATIONS, ARCHITECTURAL, STRUCTURAL, PLUMBING AND HVAC DRAWINGS & ALL OTHER RELEVANT DETAILS.
- DIMENSIONS/MEASUREMENTS GIVEN IN LAYOUT AND DETAILED DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE TO CALCULATE THE ACTUAL DIMENSIONS/ MEASUREMENTS ACCORDING TO STRUCTURAL AND ARCHITECTURAL DRAWINGS.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH ALL RELEVANT DETAILS TO THE ENGINEER FOR APPROVAL ACCORDING TO THE GENERAL CONDITIONS OF CONTRACT WELL IN TIME BEFORE COMMENCEMENT OF THAT WORK.
- PROPER CO-ORDINATION OF ELECTRICAL WORKS WITH OTHER SERVICES SHALL BE CARRIED OUT AT SITE.
- ALL NON - CURRENT CARRYING PARTS I.E. OUTER CASINGS OF EQUIPMENT SUCH AS HT & LT PANELS, DISTRIBUTIONS BOARDS, CABLE TRAYS, AUXILIARY CONSTRUCTIONS FOR EQUIPMENT ETC. SHALL BE CONNECTED TO THE GROUNDING/ EARTHING SYSTEM AT REQUIRED NUMBER OF POINTS WITH SPECIFIED SIZES OF CONDUCTORS. WATER PIPES ALONG ELECTRICAL LINE SHALL BE BONDED TO THE EARTHING SYSTEM WITH 10 Sq.mm. SINGLE CORE, COPPER CONDUCTOR PVC CABLE.
- ELECTRICAL POINTS FOR EQUIPMENT SHALL BE INSTALLED IN CO-ORDINATION WITH THE RELEVANT EQUIPMENT DRAWINGS OF OTHER SERVICES SUCH AS COMMUNICATION SYSTEMS, HVAC, PLUMBING ETC. THE LOCATION ON ELECTRICAL DRAWINGS IS ONLY INDICATIVE.
- ARRANGEMENT OF ELECTRICAL EQUIPMENTS ON ELECTRICAL DRAWINGS ARE TENTATIVE. EXACT ARRANGEMENT OF EQUIPMENTS SHALL BE MADE IN VIEW OF ITS PHYSICAL DIMENSIONS AND EASE OF MAINTENANCE.
- LOADS ON ALL PHASES SHALL BE BALANCED AT THE TESTING/ COMMISSIONING STAGE.
- CONDUIT/DUCT RUN UNDER FLOOR SHALL HAVE A MINIMUM COVER OF 2" FROM TOP OF CONDUIT/DUCT TO FINISH FLOOR LEVEL.
- RUN GREEN-YELLOW OR GREEN SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED SIZES AS EARTH CONTINUITY CONDUCTOR (ECC) ALL ALONG LIGHT AND POWER WIRING. WHEREVER THE SIZE IS NOT SPECIFIED THE FOLLOWING CRITERIA SHALL BE OBSERVED TO DETERMINE MINIMUM CROSS SECTIONAL AREA OF EARTH CONTINUITY CONDUCTOR (ECC) IN RELATION TO THE AREA OF ITS PHASE CONDUCTORS. RUN SEPARATE ECC FOR EACH CIRCUIT.
 - ECC & PHASE CONDUCTOR OF SAME SIZE FOR UPTO AND INCLUDING 16 Sqmm CABLES.
 - 16 Sqmm ECC FOR PHASE CONDUCTOR OF 16 Sqmm, 25 Sqmm & 35 Sqmm CABLES.
 - FOR CABLES OF 50 Sqmm AND ABOVE SIZES, ECC IS HALF SIZE OF PHASE CONDUCTOR.
 - MAXIMUM SIZE OF ECC IS 70 Sqmm (IF NOT MENTIONED OTHERWISE).
- ALL WIRING TO LIGHT AND SOCKET CIRCUITS & FOR CONTROLS SHALL BE CARRIED OUT WITH SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED VOLTAGE GRADE IN SURFACE GI CONDUIT OF SPECIFIED SIZE. UNLESS SPECIFICALLY STATED ON DRAWINGS/BOQ.
- LIGHT CONTROL SWITCH BOARD SHALL BE INSTALLED 6" AWAY

- BEFORE DETERMINING THE CUT LENGTHS OF CABLE, THE ACTUAL MEASUREMENT AT SITE SHALL BE MADE WITH PROVISION FOR SLACK AT LT PANELS/ DISTRIBUTION BOARDS AND SPARE LENGTH FOR LOOPS AS REQUIRED.
- ALL UNDERGROUND PIPES AFTER INSTALLATION SHALL BE PLUGGED AND SEALED AT BOTH ENDS AND JOINTS TO AVOID INGRESS OF WATER INTO PIPES.
- APPROPRIATE SIZE CLASS 'D' PVC PIPES SHALL BE LAID ALL ALONG THE CROSSINGS OF CABLES UNDER ROADS OR PAVED AREAS.
- THE NO. OF SINGLE CORE CABLES IN ANY CONDUIT SHALL BE DETERMINED SUCH THAT THE RATIO OF CABLE AREA INCLUDING PROTECTIVE EARTH CONDUCTOR TO CONDUIT AREA IS NOT MORE THAN 0.4:1.0. WHERE DIFFERENT SIZES OF CABLES RUN IN SAME CONDUIT, THE SIZE SHALL BE BASED ON ACTUAL CABLE AREA. WHEREVER CONDUIT SIZE IS NOT SPECIFIED, 25mm. DIA CONDUIT SHALL BE INSTALLED PROVIDED IT MEETS THE ABOVE CRITERIA. THE FOLLOWING TABLE IS GIVEN AS GENERAL GUIDELINE.

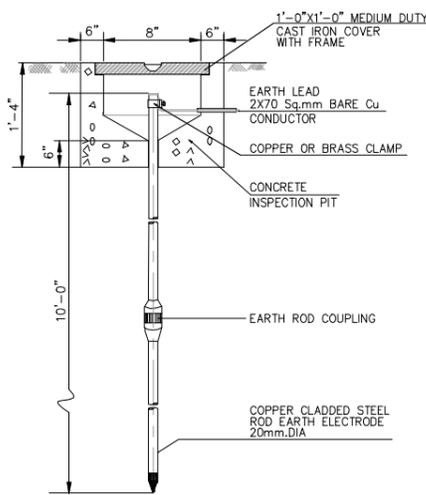
S.NO	NOMINAL CONDUCTOR SIZE(SQMM)	NO. & DIA OF WIRES	NOMINAL OVERALL DIA	20 MM DIA (3/4" DIA)	25 MM DIA (1" DIA)	32 MM DIA (1 1/4" DIA)
1	1.5	1/1.38	3.1	10	18	30
2	2.5	1/1.78	3.5	8	14	23
3	2.5	7/0.67	3.8	7	12	20
4	4	7/0.85	4.3	5	9	15
5	6	7/1.04	4.9	4	7	12
6	10	7/1.35	6.2	2	4	7
7	16	7/1.70	7.3	-	3	5
8	25	7/2.14	9.0	-	2	3
9	35	19/1.53	10.3	-	-	2

- EACH CIRCUIT NORMAL OR EMERGENCY SHALL BE LAID IN A SEPARATE CONDUITS OF APPROPRIATE SIZE AS MENTIONED IN ABOVE TABLE.
- ALL WIRING FOR CONTROLS SHALL BE CARRIED OUT WITH MULTI CORE PVC CABLES OF SPECIFIED REQUIRED VOLTAGE GRADE AND SIZES.
- THE WIRING SHALL BE CONTINUOUS LOOPING-IN AND LOOPING -OUT TYPE AND NO JOINT IN WIRES SHALL BE ALLOWED.
- THE WIRING SYSTEM SHALL BE CARRIED OUT ONLY AFTER THE CONDUIT SYSTEM IS COMPLETELY INSTALLED AND ALL OUTLET BOXES, ETC. ARE FIXED IN POSITION. ALL ROUGH EDGES OF CONDUITS / ACCESSORIES SHALL BE SMOOTH BEFORE WIRING.
- MOUNTING HEIGHTS OF ELECTRICAL FITTINGS WHEN MEASURED FROM FINISHED FLOOR LEVEL (F.F.L.) TO THE BOTTOM OF FITTINGS SHALL BE AS UNDER, UNLESS OTHERWISE SHOWN OR INSTRUCTED.

DISTRIBUTION BOARD/ISOLATED POWER PANEL	1200mm
ON/OFF PUSH BUTTON	1200mm
LIGHT CONTROL SWITCH (ONE WAY/TWO WAY)	1200mm
15A/16A/20A/GROUNDING JACK MODULES	250mm / REFER ARCH. DRAWINGS.
OUTLETS	
EXHAUST FAN	REFER ARCH DWG.
TELECOM OUTLET	250 mm
TELECOM OUTLET FOR WIRELESS ACCESS POINT	2400 mm
TV OUTLET	250 mm

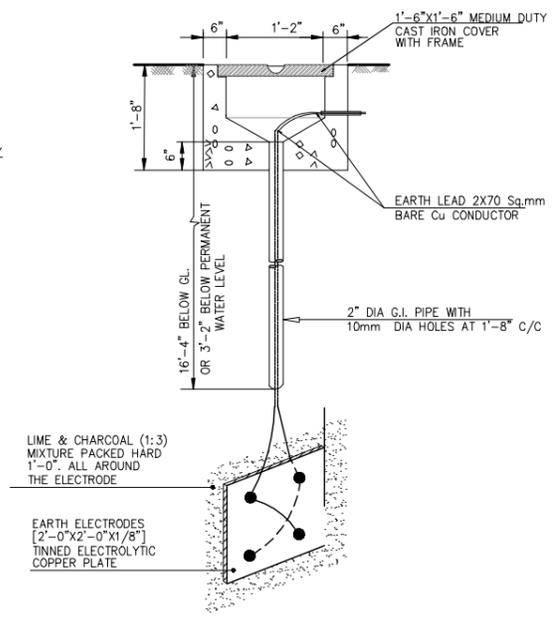
LIGHT FIXTURES SCHEDULE			
S.#	LEGEND	DESCRIPTION	REMARKS
1		BULK HEAD LIGHT FIXTURE WITH 1x26 WATT CFL, POLYCARBONATE DIFFUSER, EYE LID TYPE, IP54, PIERLITE TYPE OPUS OR EQUIVALENT*	WALL MOUNTED
2		LED RECESSED MOUNTED SPOT DOWNLIGHT 700 LUMENS (24 DEG BEAM ANGLE), LED OUTPUT DRIVER, IP20	RECESSED MOUNTED
3		LED RECESSED MOUNTED DOWNLIGHT 2100 LUMENS (8 INCH DIA OR MINIMUM), POWER RATING 80 WATT/ LUMNES, LED OUTPUT DRIVER, IP20	RECESSED MOUNTED
4		LED RECESSED MOUNTED SQUARE DOWNLIGHT (1FT X 1FT), 2100 LUMENS (8 INCH DIA OR MINIMUM), POWER RATING 80 WATT/ LUMNES, LED OUTPUT DRIVER, IP20	RECESSED MOUNTED
5		LED STAIRCASE LIGHT FIXTURE, LED OUTPUT DRIVER, IP20	UNDER STAIR CASE
6		SURFACE MOUNTED/SUSPENDED BULK HEAD, NON MAINTAINED TYPE EXIT LIGHT FIXTURE, WITH Ni-Cd BATTERY BACKUP UNIT FOR 3HOURS BACKUP, IP65, OR EQUIVALENT*	WALL/RECESSED/SURFACE MOUNTED
7		56" CEILING FAN	CEILING MOUNTED
8		FALSE CEILING FAN 2 FEET BY 2 FEET	RECESSED MOUNTED

*AS PER LIST OF MANUFACTURE IN VOL-I OF BIDDING DOCUMENT.



EARTH ELECTRODE (ROD TYPE)

N.T.S.



EARTH ELECTRODE (PLATE TYPE)

N.T.S.

CLIENT:		JINNAH SINDH MEDICAL UNIVERSITY KARACHI
PROJECT:	REPAIR & RENOVATION OF LECTURE HALLS OF GROUND & FOURTH FLOOR AT JINNAH SINDH MEDICAL UNIVERSITY KARACHI.	
TITLE:	ELECTRICAL LEGEND, GENERAL NOTES & MISSC DETAIL	
NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED, KARACHI		
DESIGN: OBAID BALOCH	RECOMMENDED BY:	VER/CD.
OWN: SOFIAN	DATE:	APPROVED:
DATE: AUG. 2017	DRAWING NO. 3687/08/TD/ E001	SCALE: N.T.S

DATE	REFERENCE DRAWING	REV. NO.	DESCRIPTION	BY	CO.	APP.