Electricity Engineering Section

ELECTRICAL DRAWING CHECK LIST

Case ID:
Electrical Contractor Name:

<table>
<thead>
<tr>
<th>Drawing Checking Information</th>
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<tbody>
<tr>
<td>Submission cycle</td>
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<tr>
<td>1\textsuperscript{st} Submission</td>
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<td>2\textsuperscript{nd} Submission</td>
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<td>3\textsuperscript{rd} Submission</td>
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Please follow the comments and if you have any question, don't be hesitate to contact.
Part 1

1. Set up of Drawing

1.1. Case Related Comments:
1.2. Drawing Title to be mentioned.
1.3. No space for ADDC stamp.
1.4. Type of Project to be mentioned.
1.5. Minimum size of the drawing sheet A1 or A0 required.
1.6. Scale of the drawing to be mentioned.
1.7. Electrical room location and cable entry approval to be shown.
1.8. Single Line Diagram, load schedule, lighting layout, power layout, site plan drawing sheet to be submitted.
1.9. Owner name should be written.
1.10. Main Contractor name & stamp to be mentioned.
1.11. Consultant name & stamp should be mentioned.
1.12. Electrical Contractor name & stamp to be mentioned.
1.13. Sector & Plot number should be shown.
1.14. Drawing Sheet Number to be marked.
1.15. Legend should be added.
1.16. Legend and layout are not matching.
1.17. All layouts must be clear.
1.18. Grid marking required
1.19. Electrical layouts must match with approved architectural drawings
1.20. Meter schedule to be provided
1.21. Light and Power Layouts to be colored according to phase color (red, yellow, blue) and ALL other drawings to be in BLACK color.
1.22. Drawings or attachments missing.
1.23. Discuss project before re-submitting, for appt. call 800ADDC
Part 2

2. Main Distribution Board (MDB) and Single Line Diagram (SLD)

2.1. Case Related Comments:
2.2. The electricity intake must not be located on the reverse side of the bath room or kitchen wall or below bathroom, kitchen, pump room, water tank, under staircase.
2.3. Electrical room shall be with adequate size.
2.4. Door of electric room to be open outside.
2.5. Installation details of main E/R with dimension to be shown.
2.6. Clear common access to reach in E/R required.
2.7. Light fitting in E/R to be installed in front and the rare of MDB instead of direct over the MDB.
2.8. Electrical room size to be sufficient to accommodate MDB and good clearance is maintained from the back side, front side and shall meet RSB requirement.
2.9. Enclosure of the MDB is to be tropicalized or ACH (anti condensation heater) are provided within the LV panel if the room is air conditioned.
2.10. MDB shall be installed on dry, well-ventilated area and not very closed to window or door.
2.11. Electricity intake must be positioned in a dedicated room and typically made from concrete or brick Construction.
2.12. Two 6 inch pipes to be provided for ADDC incomer with manhole.
2.13. Any water pipe or AC duct passing through electrical room is not acceptable.
2.14. One emergency light must be installed in E/R.
2.15. Cable route for the outgoing cables to be within the plot limit.
2.16. Route of the cables / bus bar riser to be shown and shall be through common area and away from gas line, water pipe, AC duct.
2.17. Route of the bus bar to be checked with other services.
2.18. Route and termination of 630mm² cable from transformer to MDB are to be shown.
2.19. IP rating of bus bar to be mentioned.
2.20. Number of tap-off points on each bus bar riser not marked.
2.21. Rating of tap-off points to match with load and cable size.
2.22. Distribution arrangement of load from bus riser to be shown.
2.23. Rating of the bus bar of all distribution board to be mentioned.
2.24. All tapoff breakers shall be Plug-in-type and current limiting type.
2.25. The operating handle of the tap off shall be at accessible height.
2.26. Bus bar Riser rating must be same as rating of feeding circuit breaker.
2.27. Bus coupler (4P) shall be provided between LV panels in the same electrical room.
2.28. Correction to be made in single line diagram.
2.29. If transformer supply, main breaker is to be ACB, 46 KA (minimum).
2.30. All outgoing circuits of distribution boards must be provided with only circuit breakers (such as CBs, MCBs, MCCBs, ACBs, RCDs, RCBOs) and shall not be contain fuses of any kind.
2.31. Number of ways of MDB is more.
2.32. ACB to be with drawable type.
2.33. Feeding arrangement to be check LV or HV.
2.34. Total connected load to be checked with LDN.
2.35. Isc or kA rating of the incomer and outgoing breaker of all distribution boards are to be mentioned.
2.36. Length and Voltage drop of bus riser to be shown.
2.37. Distribution boards rated 400A and above shall be with ammeter, voltameter, neon indicating for power factor meter.
2.38. All cables running underground must be installed in ducts with ECC in separate duct.
2.39. Distance and voltage drop calculations must be provided for all cables (in volts).
2.40. The maximum voltage drop from the connection point to the area of final circuit must not exceed 4% (16V).

2.41. Circuit breaker rating shall be match with load and cable size.

2.42. In case of feeding different blocks from one LV panel each block must have its own MDB and Electrical room.

2.43. Kwh meters to be marked on SLD.

2.44. The ratings of KWH meters to be corrected.

2.45. Metering arrangement and its location to be as per the meter section requirement.

2.46. GRP meter, cabinet shall be from approved ADDC type with shutter door and ventilation area.

2.47. Maximum 25mm² cable is allowed for 3 phase direct meter.

2.48. The earthing system to be done on ground level.

2.49. The earthing system in basement is not recommended unless approved by ADDC prior to construction.

2.50. ELP protection must be provide on the main incomer as per RSB requirement.

2.51. For supplying of 500A rating and above at least two independent earth electrode must be provided.
Part 3

3. Sub Main Distribution Board (SMDB)

3.1. Case Related Comments
3.2. Distribution board shall not be installed in kitchen wall, bathroom wall or under staircase or pump room.
3.3. Size of SMDB room is inadequate (to fix SMDB, TAPOFF units and KWH meters).
3.4. Installation details of Sub electrical room to be shown.
3.5. Tap off cable glanding to be from the bottom side.
3.7. Armoured cable should be used from Tap off to SMDB.
3.8. Circuit breaker rating shall match with load and cable size.
3.9. Type of outgoing breaker MCB/MCCB to be shown.
3.10. Isc or kA rating for SMDB of incoming and outgoing breakers to be mentioned.
3.11. Separate ECC is required along with the each outgoing cable.
3.12. Number of ways must not exceed 18 TP ways.
3.13. SMDB to be at centre of typical floor, as far as possible.
3.14. Location of SMDB E/R to be shown.
3.15. Door of Sub E/R to be open to outside.
3.16. Location of SMDB Lifts shall be in ground floor.
3.17. For group of villas, location of SMDB electric room shall be close to the villa.
3.18. Separate earth pit is required if SMDB is more than 30 meter far away from MDB (except high rise building).
Part 4

4. Final Distribution Board (FDB)

4.1. Case Related Comments.
4.2. Rating of MCB’s, RCD and wire size to be rechecked.
4.3. Method of load calculation to be as per RSB requirement.
4.4. Availability of spare breakers required.
4.5. Show load on each section (100mA and 30mA).
4.6. Number of ways of single phase consumer unit not to exceed 12.
4.7. All circuits in the toilet and bathroom to be fed from same phase & 30 mA RCD.
4.8. Flexible Cables are not allowed for internal wiring.
4.9. ECC Cable should be provided.
4.10. Location of FDB should preferably be installed at the entrance to the area they serve. It should not be under staircase, bedroom, kitchen and bath wall.
4.11. FDB directly feed from MDB (transformer supply) incomer circuit breaker shall be with minimum 25 kA (Isc).
4.12. Final distribution board shall be provided at least two zones of earth leakage protection (30mA and 100mA) or (30mA and 30mA).
4.13. Breaker rating for lighting 6-15A for radial circuit 20A, for rings sockets 30A and for water heater window AC and other power points 20A, cooker 30A, to be used.
4.14. Number of ways must not exceed 14 ways TP.
4.15. 3 phase load to be balanced.
4.16. Number of connected points of each circuit to be matching with breaker rating and wire size.
4.17. Sign Board point to be shown for the shops.
4.18. Under floor trunking shall be purpose made metallic trunking for under floor sockets outlet.
4.19. Minimum number of sockets outlets and connection points must be as per RSB.
4.20. Layouts must match with load schedules.
4.21. 15A sockets should not be installed in domestic installation.
4.22. Load schedules to be corrected.
4.23. Calculation of cooker load shall be 3000 watt PLUS the largest ring or actual rating.
4.24. Circuitry shall be arranged to make same phase in one room.
4.25. All sockets outlets and flexible outlets shall be with isolating switch.
4.26. Circuit supplying a kitchen must not be to used supply any other area.
4.27. Water proof sockets and switch shall be used in laundry room.
4.28. Domestic water pump must be fed through a 30 mA RCD.
4.29. All laboratory sockets outlets in school and health center shall be protected through 10 mA RCDs.
4.30. Assume connected load for connected appliance/points shall be as per RSB.
4.31. The operating height of DB’s to be within arm’s reach from a stand position.
4.32. Switch and sockets installed externally shall be weather proof.
4.33. Three phase socket outlets must be connected on individual radial circuit.
Part 5

5. MCC, A/C Panels and Capacitor Bank

5.1. Case related comments
5.2. Chiller catalogue must be provided with highlighting the model number.
5.3. Cables are under size.
5.4. Isolators on roof should be IP65 and suitable for corrosive of the surrounding environment.
5.5. The size and location of MCC room not adequate
5.6. Cable tray between MCC panel and the AC unit to be shown
5.7. Capacitor bank to be provided with MCC panel in the same room
5.8. AC panel inside pump room is not permitted
5.9. Route of the bus bar / cables to MCC panel shall be through common area.
5.10. Cable routes for the incomer and outgoing of panel to be shown
5.11. Chillers isolator to be provided
5.12. Starter of chilled water pump to be shown on the drawings
5.13. Water pipes not allowed to cross the MCC room
5.14. If AC provided in mechanical room should be provided (ACH) in MCC-panel
5.15. Cap. Bank to be in separate cubicle
5.16. Bus bar riser route is not permitted through open to sky
5.17. Kitchen and toilets extract fans to be shown on drawings
5.18. Three phase Sockets for cleaning cradle shall not be looped together.
5.19. Chillers to be fed directly from AC panel located in the roof instead of from MDB.
5.20. Sequence control panel to be provided for stand by operation of chiller or chiller water pumps.

5.21. Installation details of MCC room with dimension to be shown.

5.22. Pump room should be separate from MCC/AC panel room.

5.23. Breaker capacity and size of cable shall be match with chiller load.


5.25. The KVAR rating to be corrected.

5.26. Capacitor Bank must have clearance for ventilation of minimum 0.75 m around the panel.

5.27. Harmonic filters to be provided in the capacitor bank.

5.28. De-tuning of reactor to be 5.6 % for the capacitor bank with harmonic reactor.

5.29. Data sheet shall be submitted with highlight the model number to prove power factor between 0.9 lagging and unity for residential villas.
Part 6

6. Generator, ATS, Motors and Lighting Poles

6.1. Case related comments

6.2. Separate room to be provided for generator with good ventilation.

6.3. Adequate rated circuit breaker to be provided in generator side.

6.4. KVA/Kw rating of generator to be shown.

6.5. Earthing of generator to be shown.

6.6. The charge over circuit breakers shall have 4 poles for a three phase generator and 2 poles for single phase generator.

6.7. Location of ATS shall be shown in E/R or in a separate room.

6.8. The fuel discharge pipe and water discharge pipe should be a safe manner and does not poses a threat to the general public or maintenance staff.

6.9. All control panels shall be IP55 with metallic enclosure.

6.10. All single phase motor above 1 H.P and three phase motors above 3 H.P shall have current limiting starter with earth leakage protection.

6.11. Machine / Equipment shall be connected in ring earth (Cu strip)

6.12. Isolator shall be provided adjacent to all machine / Equipment.

6.13. Loop in loop out cut out to be provided in the pole lights.

6.14. Pole lights shall be earthed or provided by an earthed equipotential bonded system.

6.15. Length and voltage drop for pole lights circuit/ boundary lights circuit to be shown.

6.16. Earth leakage protection to be provided for boundary lights/pole lights.

6.17. Earth leakage for decorative lightning shall be 10 mA if taken from external lightning cut out.
Part 7

7. Special Locations and System

Swimming pools and water fountains, Marinas and similar Locations, Solar photovoltaic System

7.1. Case related comments
7.2. Single Line Diagram to be corrected.
7.3. Swimming pool / water fountain details shall be submitted as per RSB requirement.
7.4. All circuit shall be protected through RCBO (30 mA).
7.5. Under water lighting must be supplied by SELV at maximum voltage of 12V ac or 30 DC with ingress protection IPx8.
7.6. The underwater junction box to be IP68.
7.7. No socket outlet shall be installed within arm's reach of a swimming pool area.
7.8. Cable used for swimming pool or fountain is to be rubber sheath cable.
7.9. Swimming pool / water fountain which is not ready reapproval and inspection to be made one it's ready.
7.10. Local isolator to be provided for all pumps and pool plant.
7.11. Outside socket outlets must be provided with integrate RCD (30 mA) protection.
7.12. Local isolator shall be provided for pedestals.
7.13. Each circuit supplying pedestals shall have a protection RCD (30mA).
7.14. Only 4 socket outlets are allowed on a single pedestal.
7.15. Minimum one 16A single phase outlet shall be provided.
7.16. Single phase socket outlets shall be blue in color and three phase socket outlets shall be red in color.
7.17. A warning sign of existing 400V shall be provided on three phase socket outlet.
7.18. All PV d.c cables shall be double insulated and black in color.
7.19. Each inverter shall be provided with a type B RCD (IEC62423).
7.20. 4P isolator shall be provided on d.c side and AC side of the inverter.

7.21. Labeling along PV d.c cables shall be provided to indicate the polarity and associated dangers at every 5 to 10 m.

7.22. Locable isolator with enclosure shall be provided adjacent to MDB to feed solar PV system.

7.23. All the installations of swimming pools, water fountains, marinas and solar photovoltaic System shall be done as RSB.