



| SYMBOL | DESCRIPTION |
|----------|--|
| [Symbol] | SURGE ARRESTER WITH SURGE COUNTER |
| [Symbol] | CAPACITOR VOLTAGE TRANSFORMER |
| [Symbol] | CURRENT TRANSFORMER |
| [Symbol] | MOTORISED CENTRE BREAK DISCONNECTOR WITHOUT EARTH SWITCH |
| [Symbol] | MOTORISED CENTRE BREAK DISCONNECTOR WITH MOTOR AND SINGLE HAND OPERATED EARTH SWITCH |
| [Symbol] | 245/145kV/36kV CIRCUIT BREAKER |
| [Symbol] | AUTO TRANSFORMER |
| [Symbol] | VOLTAGE TRANSFORMER |
| [Symbol] | AUXILIARY TRANSFORMER |
| [Symbol] | EARTHING TRANSFORMER |

RELAYS

| SYMBOL | DESCRIPTION |
|--------|---|
| [SYN] | SYNCHRO CHECK RELAY |
| [DIF] | DIFFERENTIAL RELAY |
| [ZC] | DISTANCE RELAY |
| [REF] | RESTRICTED EARTH FAULT RELAY |
| [SEF] | STANDBY EARTH FAULT RELAY |
| [IC] | OVER CURRENT RELAY |
| [I>] | EARTH FAULT RELAY |
| [I<] | DIRECTIONAL OVER CURRENT RELAY |
| [IC<] | DIRECTIONAL EARTH FAULT RELAY |
| [IC>] | OVER CURRENT PROTECTION RELAY |
| [BFR] | BREAKER FAILURE RELAY |
| [BB] | BUSBAR PROTECTION RELAY |
| [EFP] | END FAULT PROTECTION |
| [TCS] | TRIP CIRCUIT SUPERVISION RELAY |
| [I=0] | AUTO RECLOSE DEVICE |
| [U>] | UNDER VOLTAGE RELAY |
| [F>] | OVER FREQUENCY RELAY |
| [F<] | UNDER FREQUENCY RELAY |
| [d/f] | RATE OF CHANGE OF FREQUENCY RELAY |
| [u/f] | OVER FLUXING PROTECTION RELAY |
| [AVR] | AUTOMATIC VOLTAGE REGULATOR |
| [VTS] | VT SIGNAL SUPERVISION |
| [BCU] | BAY CONTROL UNIT |
| [I=0] | INSTANTANEOUS RESIDUAL OVERCURRENT PROTECTION |
| [I>0] | INSTANTANEOUS PHASE OVERCURRENT PROTECTION |

SYSTEM PARAMETERS:

| SL. | DESCRIPTION OF PARAMETER | DATA |
|--|---|--|
| 1 | SYSTEM OPERATING VOLTAGE | 220kV 132kV 33kV |
| 2 | HIGHEST SYSTEM VOLTAGE | 245kV 145kV 36kV |
| 3 | RATED FREQUENCY | 50Hz 50Hz 50Hz |
| 4 | NO. OF PHASES | 3 |
| 5 | RATED INSULATION LEVELS | |
| a) LIGHTNING IMPULSE WITHSTAND VOLTAGE : | | 105kVp 65kVp 170kVp |
| b) ONE MINUTE POWER FREQUENCY WITHSTAND VOLTAGE | | 460kV 275kV 70kV |
| 6 | SYSTEM NEUTRAL EARTHING | SOLID SOLID THROUGH EARTHING TRANSFORMER |
| 7 | MINIMUM CLEARANCES AS PER SPECIFICATION | |
| a) BETWEEN LIVE METAL OF DIFFERENT PHASES | | 2200mm 1350mm 325mm |
| b) BETWEEN LIVE METAL AND EARTH | | 2200mm 1350mm 325mm |
| c) SAFETY CLEARANCE BETWEEN LIVE METAL AND POSITIONS TO WHICH ACCESS IS PERMISSIBLE WITH OTHER CONDUCTIVE EQUIPMENT | | 4500mm 3650mm 2625mm |
| d) MINIMUM SAFETY CLEARANCE BETWEEN THE NEAREST POINT NOT AT EARTH POTENTIAL OF AN INSULATOR TO GROUND (PEDESTRIAN ACCESS) | | 2300mm 2300mm 2300mm |

METERS

| SYMBOL | DESCRIPTION |
|--------|--------------------|
| [A] | AMMETER |
| [V] | VOLTMETER |
| [W] | WATT METER |
| [VA] | VAR METER |
| [PF] | POWER FACTOR METER |
| [F] | FREQUENCY METER |

TRAF. TROUBLES AUTO TRANSFORMER

| SYMBOL | DESCRIPTION |
|--------|---|
| [B] | BUCHHOLZ (GAS) RELAY |
| [P] | PRESSURE RELIEF DEVICE FOR MAIN TANK AND OLTC (MV & LV) |
| [O] | OIL LEVEL LOW - MAIN TANK & OLTC |
| [O] | OIL TEMPERATURE INDICATION TRAF. OIL TEMP. HIGH |

TRAF. TROUBLES EARTHING TRANSFORMER

| SYMBOL | DESCRIPTION |
|--------|---|
| [B] | BUCHHOLZ (GAS) RELAY |
| [P] | PRESSURE RELIEF DEVICE |
| [O] | OIL TEMPERATURE INDICATION TRAF. OIL TEMP. HIGH |

TRAF. TROUBLES AUXILIARY TRANSFORMER

| SYMBOL | DESCRIPTION |
|--------|---|
| [P] | PRESSURE RELIEF DEVICE |
| [O] | OIL TEMPERATURE INDICATION TRAF. OIL TEMP. HIGH |

REFERENCE DRAWINGS:

- TENDER 220/132kV SINGLE LINE DIAGRAM - DRG No. TD/CE/1/97/D/00/02
- TENDER 33kV GS SINGLE LINE DIAGRAM - DRG No. TD/CE/1/97/D/00-8/02

NOTES:

- CONTROL, METERING, INDICATION & PROTECTION EQUIPMENTS ARE AS PER SPECIFICATION
- CT PARAMETER ARE BASED ON CT APPLICATION CHECK
- ISOLATORS ARE ELECTRICALLY INTERLOCKED WITH RESPECTIVE BREAKERS TO PREVENT CLOSING/OPENING OF ISOLATORS UNDER LOAD CONDITION

AUXILIARY SUPPLY

- AC: 400V, 3PHASE, 4 WIRE, 50Hz 230V, 1PHASE, 2 WIRE, 50Hz SOLIDLY EARTHED
- DC: 220V, 2 WIRE UNEARTHED

LEGEND:

- - - - - PROPOSED SCOPE
- FUTURE

LEGEND:

| | |
|-------|--|
| CB | CIRCUIT BREAKER |
| DS | DISCONNECTING SWITCH |
| DS/ES | 3 POSITION DISCONNECTOR (CLOSE-OPEN-EARTH) |
| SA | SURGE ARRESTER |
| CVT | CAPACITOR VOLTAGE TRANSFORMER |
| CT | CURRENT TRANSFORMER |
| AUTO | MAIN AUTO TRANSFORMER |
| NCT | NEUTRAL CURRENT TRANSFORMER |
| AUX | AUXILIARY TRANSFORMER |
| EARTH | EARTHING TRANSFORMER |
| TRAF. | TRAF. |

AS-BUILT

EMPLOYER'S REPRESENTATIVE APPROVAL STAMP:

| REV. | DATE | DESCRIPTION | CHKD | DRN | CE/APPD. |
|------|------------|------------------|------|-----------|----------|
| R1 | 05.06.2016 | AS-BUILT | SS | PS | PS |
| RO | 28.02.2016 | FIRST SUBMISSION | RT | WAG/RT/UD | |

EMPLOYER: **CEYLON ELECTRICITY BOARD SRI LANKA**

CONTRACTOR: **ABB INDIA LIMITED**

PROJECT TITLE:
CLEAN ENERGY AND NETWORK EFFICIENCY IMPROVEMENT PROJECT PACKAGE 3: CONSTRUCTION OF 220kV TRANSMISSION INFRASTRUCTURE - LOT A

CONTRACT NO. ICB No. CEB/AGM/PROJ/2012/ICB/CE&NEIP-P3/01

| DESIGN | DATE | NAME | DRAWING TITLE |
|----------|------------|--------|--------------------------------|
| DESIGN | 15.01.15 | RT | PROTECTION SINGLE LINE DIAGRAM |
| DRAWN | 20.01.2015 | YSS | FOR 220/132/33kV POLPITIYA GSS |
| CHECKED | 21.01.2015 | WAG/RT | |
| APPROVED | 22.01.2015 | UDK | |

SCALE: NTS DRAWING NO.: 3VIN 14 0590 X1 1019