# DISTRIBUTION CONSTRUCTION STANDARDS

*Date Published: 14 May 2020*

## PART 10 – SUBSTATIONS

## G1 - DISTRIBUTION SUBSTATION CONNECTION ARRANGEMENTS

For application to

Horizon Power

Electricity Distribution Networks

# G1 - DISTRIBUTION SUBSTATION CONNECTION ARRANGEMENTS – Drawing Register

| Number | Description |
|---|---|
| G1-2/1 | Transformer and LV Feeder - Ground Mounted Fusing Type Air HRC |
| G1-2/2 | Transformer and LV Feeder – Overhead Fusing Type EDO and SMU Fuse Charts |
| G1-2/3 | Isolation Transformer – Overhead and RMU Fusing Type EDO, SMU and Air HRC Fuse Charts |
| G1-3/1 | District Substation – Discrete LV Load below 315A Customer's MSB – Non-contiguous, Customer Supplied from Shared LV Street Circuit Customer Connection Arrangements |
| G1-3/2 | District Substation – Discrete LV Load below 315A Customer's MSB – Non-contiguous, Customer Supplied from Shared LV Street Circuit Customer Connection Arrangements |
| G1-4/1 | District Substation – Discrete LV Load below 315A Customer's MSB – Non-contiguous, Customer Supplied from Shared LV Street Circuit Customer Connection Arrangements |
| G1-4/2 | District Substation – Discrete LV Load below 620A Customer's MSB – Non-Contiguous, Customer Supplied Dedicated Parallel LV Street Circuits Customer Connection Arrangements |
| G1-5 | District Substation – Discrete LV Load upto 1310A Customer's MSB – Contiguous, Customer LV Circuit from Dedicated LV Circuit Customer Connection Arrangements |
| G1-6 | District Substation – Discrete LV Load upto 2000A/2500A Customer's MSB Contiguous, Customer Supplied from Dedicated LV Circuit Customer Connection Arrangements |
| G1-7 | Sole Use Substation – Discrete LV Load upto 1310A Customer's MSB Contiguous, Customer Supplied from Dedicated Transformer Customer Connection Arrangements |
| G1-8 | Sole Use Substation – Discrete LV Load upto 2625A Customer's MSB Contiguous, Customer Supplied from Dedicated Transformer Customer Connection Arrangements |
| G1-9 | Sole Use Substation – Discrete LV Load upto 5250A Customer's MSB Contiguous, Customer Supplied from Dedicated Transformer Customer Connection Arrangements |
| G1-10/1 | Customer Owned Substation MV Metering |
| G1-10/2 | Customer Owned Substation MV Metering – Ground Mounted Outdoor |
| G1-10/3 | Customer Owned Substation MV Metering – Ground Mounted Outdoor |
| G1-10/4 | Customer Owned Substation MV Metering – Ground Mounted Outdoor Cable Connected (HP Preferred Arrangement) |
| G1-10/5 | Customer Owned Substation MV Metering – Ground Mounted Indoor with Customer Generator |
| G1-10/6 | Customer Owned Substation MV Metering – Ground Mounted Indoor with Customer Generator (Alternative Arrangement) |

GROUND MOUNTED MV RING MAIN UNIT
AIR HRC FUSES (DIN 43625)

| VOLTAGE | Tx kVA | MV FUSE (A) | LV MAX FUSE SIZE (A) |
|---|---|---|---|
| 6.6kV Tx | 100 | 31.5 | 200 |
| | 160 | 31.5 | 200 |
| | 200 | 31.5 | 315 |
| | 315 | 50 | 315 |
| | 630 | 100 | 400 |
| | 1000 | 160 | 400 |
| 11kV Tx | 160 | 25 | 200 |
| | 200 | 25 | 315 |
| | 315 | 31.5 | 315 |
| | 630 | 50 | 400 |
| | 1000 | 80 | 400 |
| 22kV Tx (INCLUDES 12.7kV Tx) | 63' | 10 | 100 |
| | 100 | 10 | 200 |
| | 160 | 10 | 200 |
| | 200 | 10 | 315 |
| | 315 | 16 | 315 |
| | 630 | 31.5 | 400 |
| | 1000 | 40 | 400 |
| 33kV Tx (INCLUDES 19.1kV Tx) | 63 | 6.3 | 100 |
| | 160 | 6.3 | 200 |
| | 315 | 8 | 315 |
| | 630 | 20 | 400 |
| | 1000 | 40 | 400 |

MV AIR HRC FUSES - DDC SECTION 10 HU55

FOR HISTORICAL PURPOSES ONLY
OIL HRC FUSES

| VOLTAGE | Tx kVA | MV FUSE (A) | LV MAX FUSE SIZE (A) |
|---|---|---|---|
| 6.6kV Tx | 315 | 50 | 315 |
| | 500 | 80 | 400 |
| | 630 | 100 | 400 |
| | 1000 | 140 | 400 |
| 11kV Tx | 315 | 40 | 315 |
| | 500 | 63 | 400 |
| | 630 | 63 | 400 |
| | 1000 | 90 | 400 |
| 22kV Tx (INCLUDES 12.7kV Tx) | 315 | 16 | 315 |
| | 500 | 25 | 400 |
| | 630 | 31.5 | 400 |
| | 1000 | 40 | 400 |
| 33kV Tx (INCLUDES 19.1kV Tx) | 315 | - | - |
| | 500 | - | - |
| | 630 | - | - |
| | 1000 | - | - |

MV DROPOUT AND RINGMAIN UNIT - AIR HRC FUSES

| Tx VOLTS | 6.6kV | 11kV | 22kV | 33kV |
|---|---|---|---|---|
| Tx kVA | MV FUSE SIZE (A) | MV FUSE SIZE (A) | MV FUSE SIZE (A) | MV FUSE SIZE (A) |
| 2 x 630 | NOT APPLICABLE | 160 | 63 | |
| 2 x 500 | | 80 | 40 | 31.5 |
| 2 x 315 | | 50 | 25 | 16 |
| 1 x 315 + 1 x 630 | | 80 | 40 | |
| 1 x 315 + 1 x 500 | | 63 | 31.5 | 25 |
| 1 x 500 + 1 x 630 | | 160 | 63 | |
| 1 x 500 | 80 | 45 | 25 | 20 |

NOTES:
1. MV FUSE SIZES ARE THE MINIMUM REQUIRED TO ENSURE NON OPERATION OF FUSES FOR TRANSFORMER ENERGISATION ETC..
2. LV FUSE SIZES ARE THE MAXIMUM WHICH CAN BE USED FOR LV CIRCUITS TO ENSURE GRADING WITH THE TRANSFORMER MV FUSE. SMALLER LV FUSES CAN BE USED.
3. DROP OUT FUSES ARE NOT SUITABLE FOR 1000kVA TRANSFORMERS AT 6.6kV. A FUSESWITCH UNIT MUST BE USED.
4. PIGGYBACKING OF TRANSFORMERS IS NOT PERMISSIBLE
5. APPLIES TO SINGLE OR STRING OF UP TO FIVE 22kV, 63kVA 3PH TRANSFORMERS
6. CONDUCTERS BETWEEN MV FUSES AND TRANSFORMER BUSHINGS TO BE INSULATED

HORIZON POWER
DISTRIBUTION CONSTRUCTION STANDARDS

# TRANSFORMER AND LV FEEDER GROUND MOUNTED FUSING TYPE AIR HRC

REVISION B | DATE OCT.17

DRAWING No. G1-2/1

| | | EXPULSION DROPOUT | LV HRC FUSE |
|---|---|---|---|
| VOLTAGE | Tx kVA | EDO FUSELINK RATING (A) | LV MAX FUSE SIZE (A) |
| 6.6kV Tx | 10 | 3.15 | 30 |
| | 25 | 5 | 100 |
| | 50 | 10 | 100 |
| | 63 | 10 | 100 |
| | 100 | 16 | 200 |
| | 160 | 31.5 | 200 |
| | 200 | 31.5 | 315 |
| | 300 | 40 | 315 |
| | 315 | 40 | 315 |
| | 630 | 80[3] | 400 |
| | | | |
| 11kV Tx | 10 | 3.15 | 30 |
| | 25 | 3.15 | 100 |
| | 50 | 5 | 100 |
| | 63 | 5 | 100 |
| | 100 | 10 | 200 |
| | 160 | 25 | 200 |
| | 200 | 25 | 315 |
| | 300 | 25 | 315 |
| | 315 | 25 | 315 |
| | 630 | 63 | 400 |
| | 1000 | 80[3] | 400 |
| 22kV Tx (INCLUDES 12.7kV tX) | 10 | 3.15 | 30 |
| | 25 | 3.15 | 100 |
| | 50 | 3.15 | 100 |
| | 63 | 3.15 | 100 |
| | 100 | 5 | 200 |
| | 160 | 10 | 200 |
| | 200 | 10 | 315 |
| | 300 | 16 | 315 |
| | 315 | 16 | 315 |
| | 630 | 31.5 | 400 |
| | 1000 | 40 | 400 |
| 33kV Tx (INCLUDES 19.1kV Tx) | 10 | 3.15 | 30 |
| | 25 | 3.15 | 100 |
| | 50 | 3.15 | 100 |
| | 63 | 3.15 | 100 |
| | 100 | 5 | 200 |
| | 160 | 8 | 200 |
| | 200 | 8 | 315 |
| | 300 | 10 | 315 |
| | 315 | 10 | 315 |
| | 630 | 25 | 400 |
| | 1000 | 31.5 | 400 |

NOTES:
1. 36kV EXPULSION DROPOUT FUSE CUTOUT AS PER DDC SECTION 1-HV51
2. FOR HIGH FAULT LEVEL AREA, K-MATE CURRENT LIMITER DDC SECTION 1 HV51 CAN BE USED WITH EDO

HORIZON POWER

DISTRIBUTION CONSTRUCTION STANDARDS

# TRANSFORMER AND LV FEEDER OVERHEAD FUSING TYPE EDO AND SMU FUSE CHARTS

| REVISION | DATE |
|---|---|
| B | OCT.17 |

DRAWING No. G1-2/2

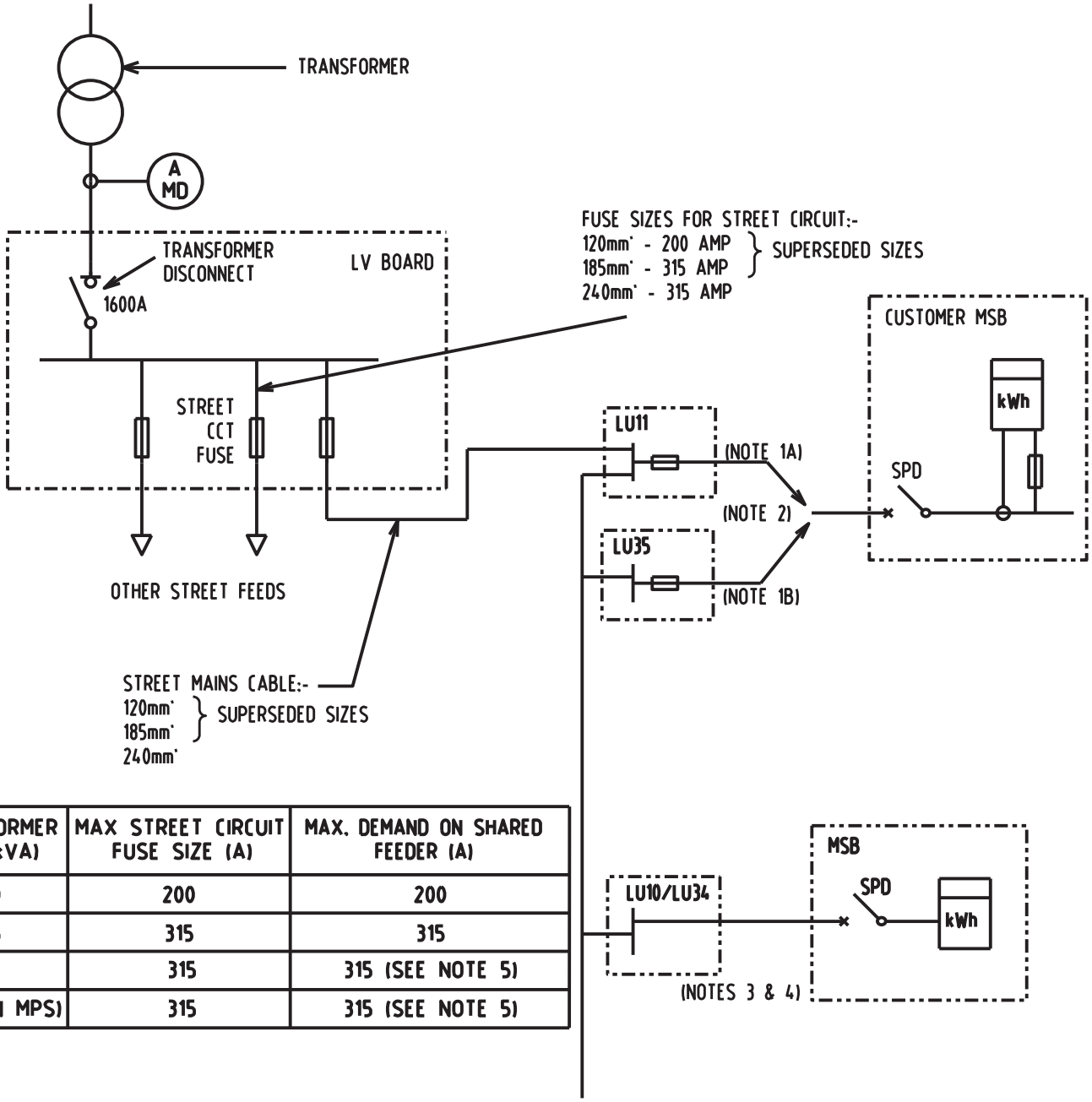
## OVERHEAD FUSING - ISOLATION TRANSFORMER SOURCE SIDE FUSING

| Tx RATING | SOURCE SIDE VOLTAGE | LOAD SIDE VOLTAGE | EXPULSION DROPOUT |
|---|---|---|---|
| | | | EDO FUSELINK RATING |
| (kVA) | (kV) | (kV) | (A) |
| | | | |
| 50 | 19.1 | 12.7 | 3.15 |
| 63 | 19.1 | 12.7 | 5 |
| 63 | 22 | 12.7 | 5 |
| 200 | 22 | 12.7 | 16 |
| 200 | 33 | 12.7 | 16 |
| 200 | 33 | 19.1 | 16 |
| 315 | 22 | 12.7 | 25 |

## RING MAIN UNIT FUSING - ISOLATION TRANSFORMER SOURCE SIDE FUSING

| Tx RATING | SOURCE SIDE VOLTAGE | LOAD SIDE VOLTAGE | MV AIR HRC FUSE |
|---|---|---|---|
| | | | AIR HRC FUSE RATTING |
| (kVA) | (kV) | (kV) | (A) |
| | | | |
| 50 | 19.1 | 12.7 | 3.15 |
| 63 | 19.1 | 12.7 | 5 |
| 63 | 22 | 12.7 | 5 |
| 200 | 22 | 12.7 | 16 |
| 200 | 33 | 12.7 | 16 |
| 200 | 33 | 19.1 | 16 |
| 315 | 22 | 12.7 | 25 |

EXPULSION DROPOUT FUSE CUTOUT - DDC SECTION 1 HV51
MV AIR HRC FUSE - DDC SECTION 10 HU55




| TRANSFORMER SIZE (kVA) | MAX STREET CIRCUIT FUSE SIZE (A) | MAX. DEMAND ON SHARED FEEDER (A) |
|---|---|---|
| 160 | 200 | 200 |
| 315 | 315 | 315 |
| 630 | 315 | 315 (SEE NOTE 5) |
| 1000 (NON MPS) | 315 | 315 (SEE NOTE 5) |

NOTES :

1. MAXIMUM SIZE CONSUMERS MAINS THAT CAN BE CONNECTED TO:
   A) UNI PILLAR ARE 2 x 185mm² OR 1 x 300mm² CABLES / PHASE.
   B) WALL MOUNTED BOX (LU35) 1 x 150mm² CABLES / PHASE
2. THIS ARRANGEMENT TO BE USED FOR ALL LOADS > 100 AMPS.
3. MAXIMUM SIZE CONSUMERS MAINS THAT CAN BE CONNECTED TO MINI PILLAR OR WALL MOUNTED BOX (LU34) ARE 1 x 35mm² CABLES PER PHASE.
4. THIS ARRANGEMENT TO BE USED FOR ALL LOADS ≤ 100 AMPS.
5. 400 AMP FUSE MAY BE USED IN COMMERCIAL / INDUSTRIAL AREAS ONLY. MAXIMUM DEMAND ON A SHARED FEEDER REMAINS AT 315 AMPS.
6. SEE SHEET 2 FOR DISCRETE LOAD ARRANGEMENTS

HORIZON POWER

DISTRIBUTION CONSTRUCTION STANDARDS

DISTRICT SUBSTATION. DISCRETE LV LOAD BELOW 315A CUSTOMER'S MSB NON-CONTIGUOUS, CUSTOMER SUPPLIED FROM SHARED LV STREET CIRCUIT CUSTOMER CONNECTION ARRANGEMENTS

| REVISION | DATE |
|---|---|
| B | JAN.18 |

DRAWING No.

G1-3/1

| ITEM | NETWORK CONNECTION ASSET | MAXIMUM LOAD (A) (NOTE 4) | SPD TYPE (NOTE 1) | MAXIMUM SPD SIZE (AMPS) | NETWORK CONNECTION FUSE SPD MUST GRADE WITH |
|---|---|---|---|---|---|
| LU10 | MINI PILLAR | 100 | FUSE / CB (NOTE 5) | 100 | N/A |
| LU34 | WALL MOUNTED BOX- 100AMP | 100 | FUSE / CB (NOTE 5) | 100 | N/A |
| LU35 | WALL MOUNTED BOX- 200AMP | 150 (NOTE 2) | CB (NOTE 6) | N/A | 200 |
| LU11 | UNIVERSAL PILLAR | 101-250 | CB (NOTE 6) | N/A | 400A (MAX) (NOTE 3) |
| LU44 | FUSE SWITCH 400A COVER WITH 630A BASE | 101-250 | CB (NOTE 6) | N/A | 400A (MAX) (NOTE 3) |

NOTES:
1. SPD DENOTES SERVICE PROTECTION DEVICE. CB DENOTES FAULT LIMITING CIRCUIT BREAKER IN ACCORDANCE WITH AS/NZS 3000
2. 200 AMP PERMITTED IN URBAN AREAS
3. A SIMALLER CONNECTION FUSE MAY BE USED FOR LOADS LESS THAN THE MAXIMUM
4. CT METERING IS REQUIRED FOR LOADS ABOVE 100 AMPS
5. STANDARD CB FAULT RATINGS OF 10kA (THREE PHASE) AND 6kA (SINGLE PHASE) ARE SUITABLE FOR LOADS UP TO 100A.
6. WHERE THE LOAD IS GREATER THAN 100A, THE CUSTOMER WILL NEED TO BE ADVISED OF A SUITABLE CB FAULT RATING (WAER CLAUSE 6.7.2) THE FOLLOWING VALUES ARE RECOMMENDED IN THESE INSTANCES: PILLAR LOCATION FROM TRANSFORMER < 50m = 25kA 3ph, ≥ 50m = 15kA 3ph

HORIZON POWER

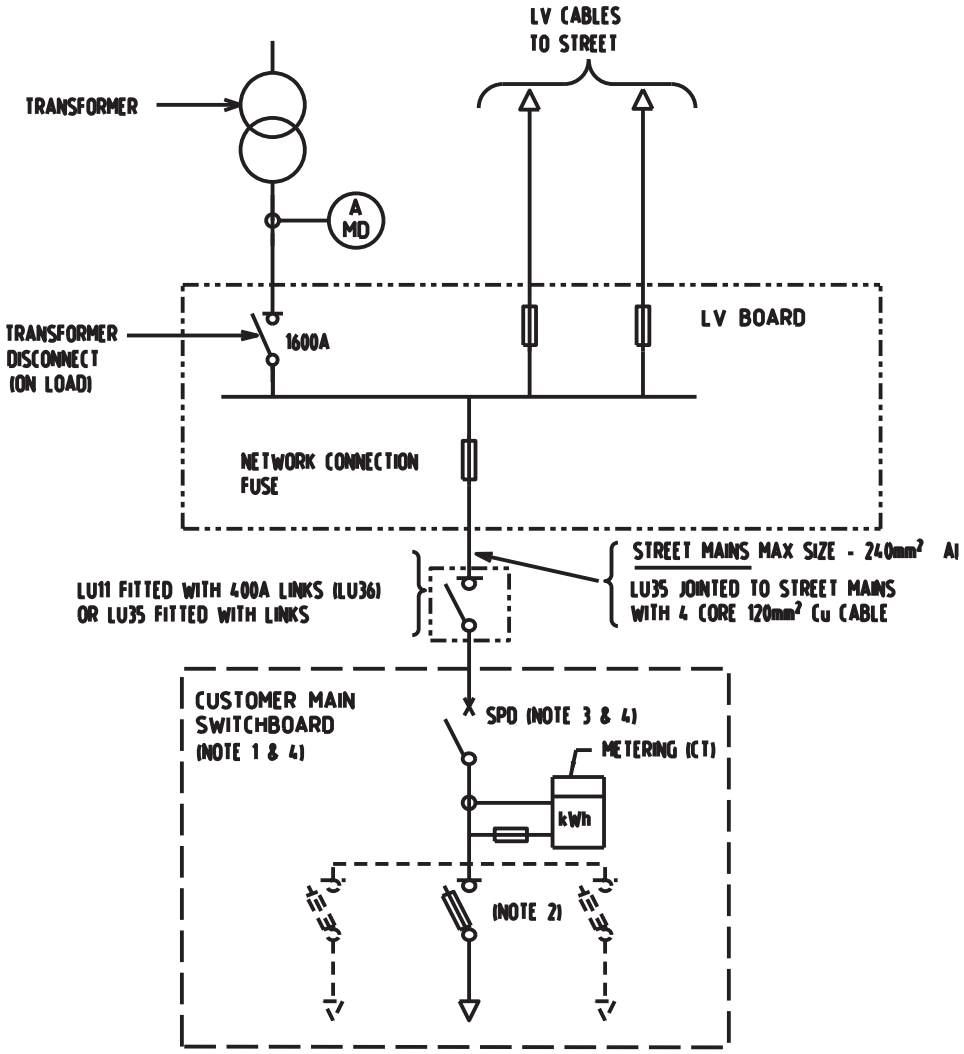
DISTRIBUTION CONSTRUCTION STANDARDS

DISTRICT SUBSTATION. DISCRETE LV LOAD BELOW 315A CUSTOMER'S MSB NON-CONTIGUOUS, CUSTOMER SUPPLIED FROM SHARED LV STREET CIRCUIT CUSTOMER CONNECTION ARRANGEMENTS

REVISION B

DATE JAN.18

DRAWING No. G1-3/2




| TRANSFORMER SIZE (kVA) | NETWORK CONNECTION FUSE SIZE (A) | MAX. CUSTOMER LOAD (A/ph) LU11 UNIVERSAL PILLAR | MAX. CUSTOMER LOAD (A/ph) LU35 LARGE WALL PILLAR |
|---|---|---|---|
| 160 | 200 | 150 | 150 |
| 315 | 315 | 250 | 200 |
| 630 | 400 | 315 | 200 |
| 1000 | 400 | 315 | 200 |

NOTES:
1. CUSTOMER MAY HAVE ONE OR MORE MAIN SWITCHES AS PER AS/NZS 3000
2. CFS SHOWN AS MAIN SWITCH(ES) - FOR ILLUSTRATION PURPOSES ONLY.
3. SPD DENOTES SERVICE PROTECTION DEVICE. CB MUST GRADE WITH THE NETWORK CONNECTION FUSE.
4. SPD MUST BE FAULT LIMITING TYPE. THE FOLLOWING FAULT RATING IS RECOMMENDED FOR THE SPD FOR A PILLAR LOCATED FROM THE TRANSFORMER AT A DISTANCE OF < 50m = 25kA 3ph,≥50m = 15kA 3ph
5. THIS ARRANGEMENT CAN BE USED FOR CUSTOMER LOADS EXCEEDING 200A, ONLY WHEN IT IS NOT POSSIBLE TO INSTALL A TRANSFORMER ON THE CUSTOMER'S PROPERTY AND THE EXISTING NEARBY TRANSFORMERS DO NOT HAVE THE NECESSARY SPARE CAPACITY AVAILABLE TO MEET THE CUSTOMER'S REQUIREMENT.

HORIZON POWER

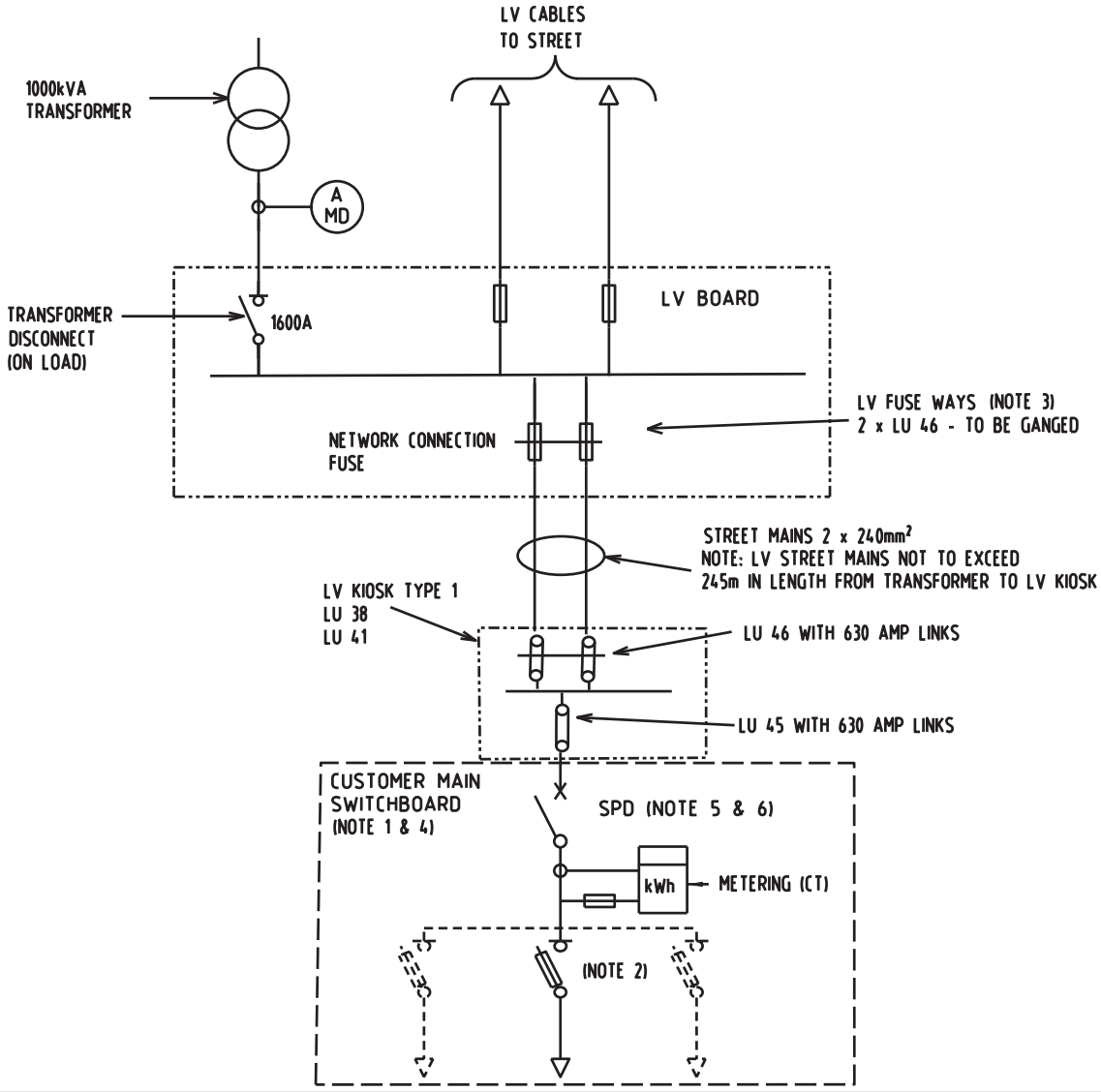
DISTRIBUTION CONSTRUCTION STANDARDS

DISTRICT SUBSTATION. DISCRETE LV LOAD BELOW 315A CUSTOMER'S MSB NON-CONTIGUOUS, CUSTOMER SUPPLIED FROM SHARED LV STREET CIRCUIT CUSTOMER CONNECTION ARRANGEMENTS

| REVISION | DATE |
|---|---|
| B | JAN.18 |

DRAWING No.

G1-4/1




| MV | 6.6kV | 6.6kV | 11kV | 11kV | 11kV | 22kV | 22kV | 22kV |
|---|---|---|---|---|---|---|---|---|
| MV FUSE TYPE | REFER TO M1_02 SUITE OF DRAWINGS | | | | | | | |
| NETWORK CONNECTION LV FUSE SIZE | 2 x 400 | 2 x 400 | 2 x 315 | 2 x 400 | 2 x 400 | 2 x 315 | 2 x 315 | 2 x 400 |
| MAX. CUSTOMER LOAD | 630 | 630 | 500 | 630 | 630 | 500 | 500 | 630 |

## THIS ARRANGEMENT IS ONLY APPLICABLE FOR 1000kVA TRANSFORMERS AND IS LIMITED TO HERITAGE BUILDINGS WHERE IT IS NOT POSSIBLE TO PROVIDE A SUBSTATION SITE

NOTES:

1. CUSTOMER MAY HAVE ONE OR MORE MAIN SWITCHES AS PER AS/NZS 3000
2. CFS SHOWN AS MAIN SWITCH(ES) - FOR ILLUSTRATION PURPOSES ONLY.
3. SPD DENOTES SERVICE PROTECTION DEVICE. CB MUST GRADE WITH THE NETWORK CONNECTION FUSE.
4. SPD MUST BE FAULT LIMITING TYPE. THE FOLLOWING FAULT RATING IS RECOMMENDED FOR THE SPD FOR A PILLAR LOCATED FROM THE TRANSFORMER AT A DISTANCE OF < 50m = 25kA 3ph,≥50m = 15kA 3ph
5. THIS ARRANGEMENT CAN BE USED FOR CUSTOMER LOADS EXCEEDING 200A, ONLY WHEN IT IS NOT POSSIBLE TO INSTALL A TRANSFORMER ON THE CUSTOMER'S PROPERTY AND THE EXISTING NEARBY TRANSFORMERS DO NOT HAVE THE NECESSARY SPARE CAPACITY AVAILABLE TO MEET THE CUSTOMER'S REQUIREMENT.

HORIZON POWER

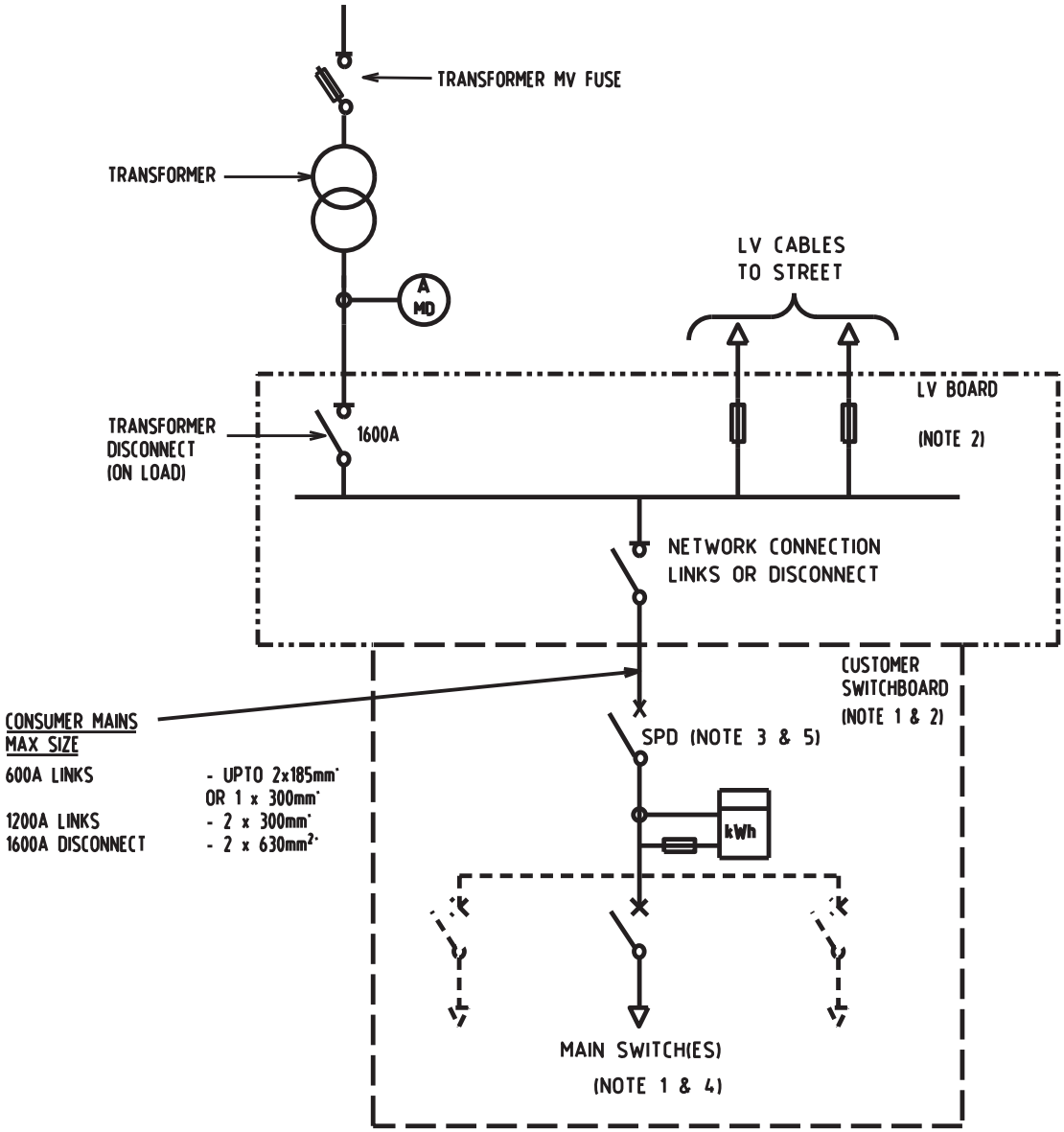
DISTRIBUTION CONSTRUCTION STANDARDS

DISTRICT SUBSTATION. DISCRETE LV LOAD BELOW 620A CUSTOMER'S MSB NON-CONTIGUOUS, CUSTOMER SUPPLIED DEDICATED PARALLEL LV STREET CIRCUITS CUSTOMER CONNECTION ARRANGEMENTS

| REVISION | DATE |
|---|---|
| C | OCT.18 |

DRAWING No.

G1-4/2




| TRANSFORMER SIZE (kVA) | CUSTOMER LINKS OR DISCONNECT (A) | MAX. CUSTOMER LOAD (A/ph) |
|---|---|---|
| 315 | 600 | 415 (TX RATING) |
| 630 | 600 | 600 |
| 630 | MPS-1200 NON MPS-1600 | 825 (TX RATING) |
| 1000 | 600 | 600 |
| 1000 | 1600 | 1310 (TX RATING) |

NOTES:
1. CUSTOMER MAY HAVE ONE OR MORE MAIN SWITCHES AS PER AS/NZS 3000.
2. SUBSTATION AND CUSTOMER SWITCHBOARD ARE TO BE CONTIGUOUS.
3. SPD DENOTES SERVICE PROTECTION DEVICE. CB MUST GRADE WITH THE TRANSFORMER MV FUSE.
4. CB SHOWN AS MAIN SWITCH(ES) - FOR ILLUSTRATION PURPOSE ONLY.
5. SPD MUST BE FAULT LIMITING TYPE AND RATED AT LEAST 25kA

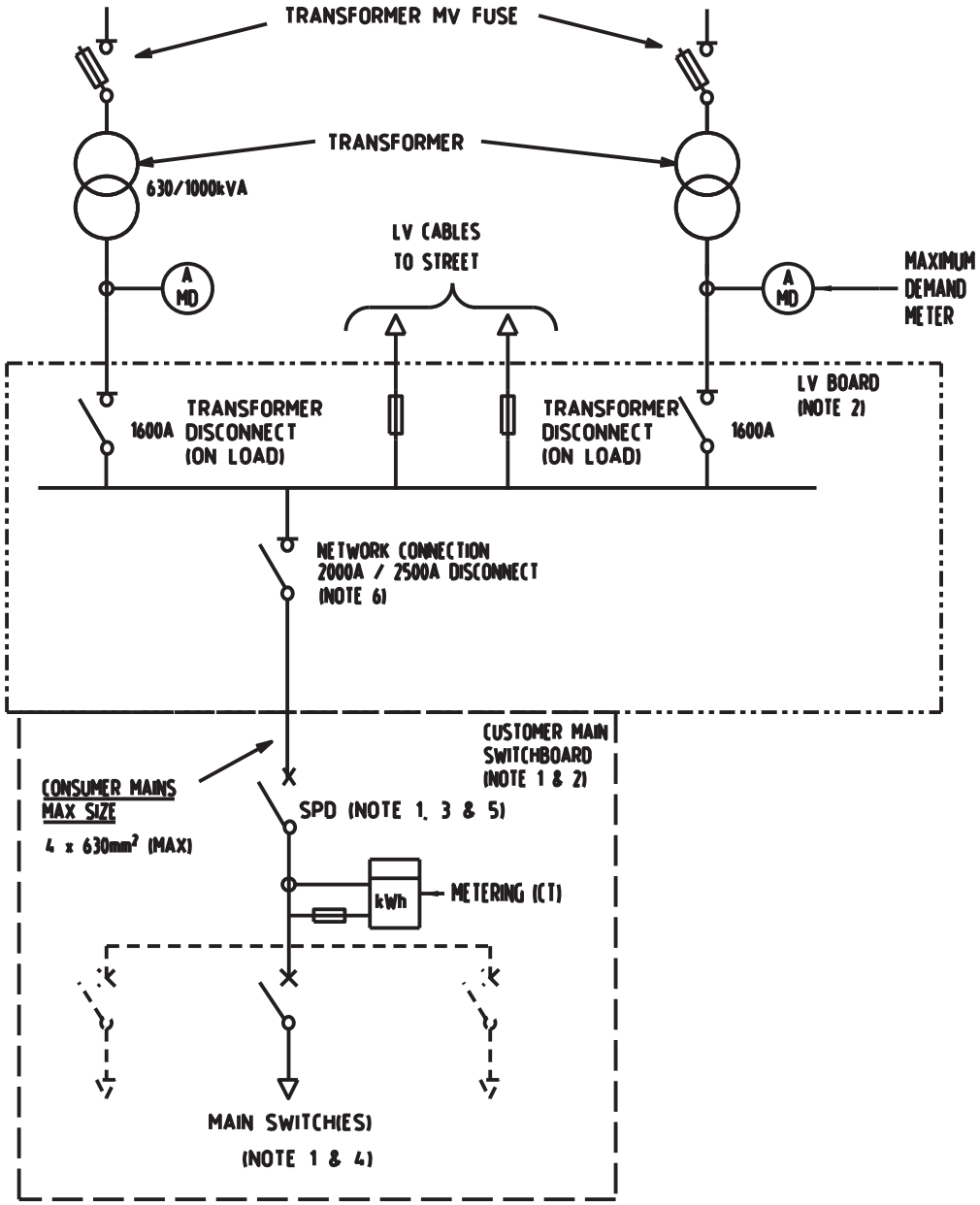
HORIZON POWER

DISTRIBUTION CONSTRUCTION STANDARDS

DISTRICT SUBSTATION. DISCRETE LV LOAD UPTO 1310A CUSTOMER'S MSB CONTIGUOUS, CUSTOMER LV CIRCUIT FROM DEDICATED LV CIRCUIT CUSTOMER CONNECTION ARRANGEMENTS

| REVISION | DATE |
|---|---|
| B | JAN.18 |

DRAWING No. G1-5

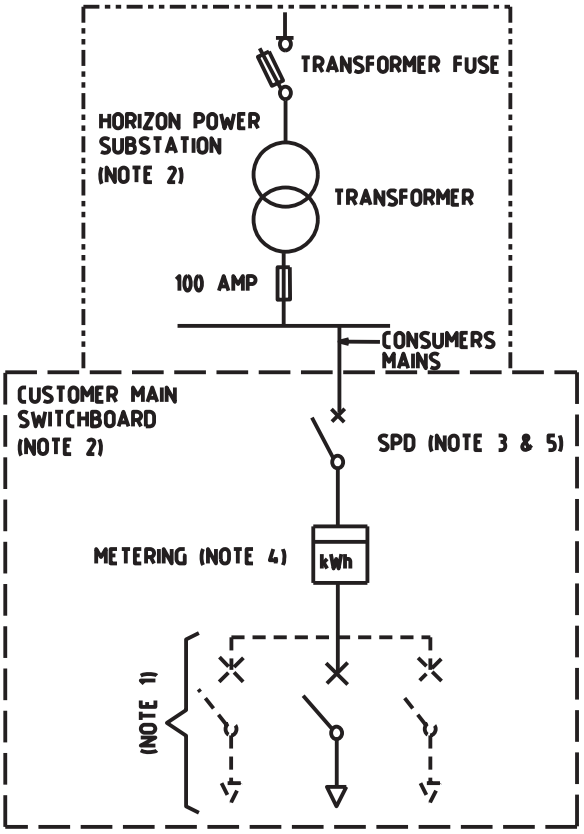



| TRANSFORMER SIZE (kVA) | CUSTOMER LINKS OR DISCONNECT (A) | MAX. CUSTOMER LOAD (A/ph) |
|---|---|---|
| 2 x 630 | 2000 | 1655 |
| 2 x 1000 | 2000 / 2500 | 2000 / 2500 |

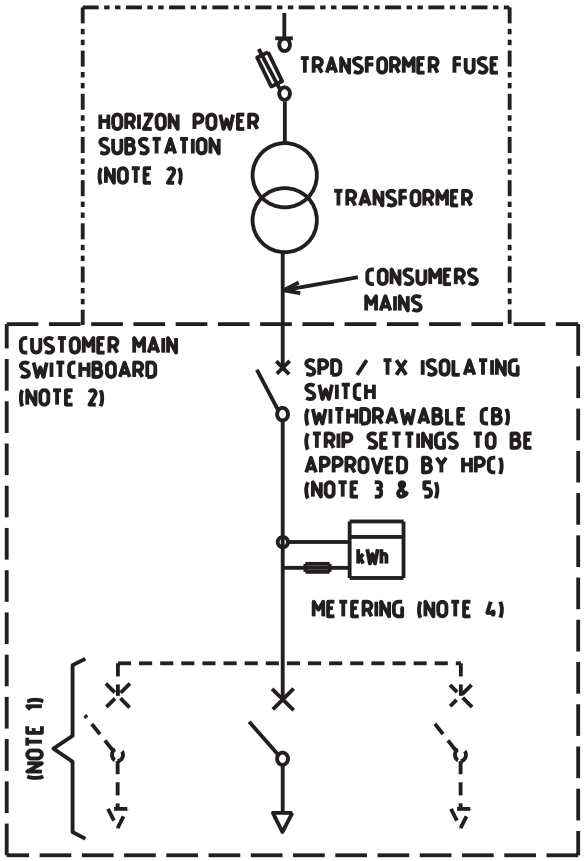
NOTES:
1. CUSTOMER MAY HAVE ONE OR MORE MAIN SWITCHES AS PER AS/NZS 3000.
2. SUBSTATION AND CUSTOMER SWITCHBOARD ARE TO BE CONTIGUOUS.
3. SPD DENOTES SERVICE PROTECTION DEVICE. CB MUST GRADE WITH THE TRANSFORMER MV FUSE.
4. CB SHOWN AS MAIN SWITCH(ES) - FOR ILLUSTRATION PURPOSE ONLY.
5. SPD MUST BE FAULT LIMITING TYPE AND RATED AT LEAST 50kA
6. 2500A OPTION AVAILABLE USING PURPOSE BUILT TYPE 3 KIOSK (BUSBAR MODIFIED TO INCREASE RATING)

| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | | REVISION<br>B | DATE<br>JAN.18 |
| | DISTRICT SUBSTATION. DISCRETE LV LOAD UPTO 2000A/2500A CUSTOMER'S MSB CONTIGUOUS, CUSTOMER SUPPLIED FROM DEDICATED LV CIRCUIT CUSTOMER CONNECTION ARRANGEMENTS | DRAWING No.<br>G1-6 | |

SPD / TX ISOLATING SWITCH CB TESTED BY ELECTRICAL CONTRACTOR TO HORIZON POWER APPROVED SETTINGS




25 AND 63kVA TRANSFORMERS

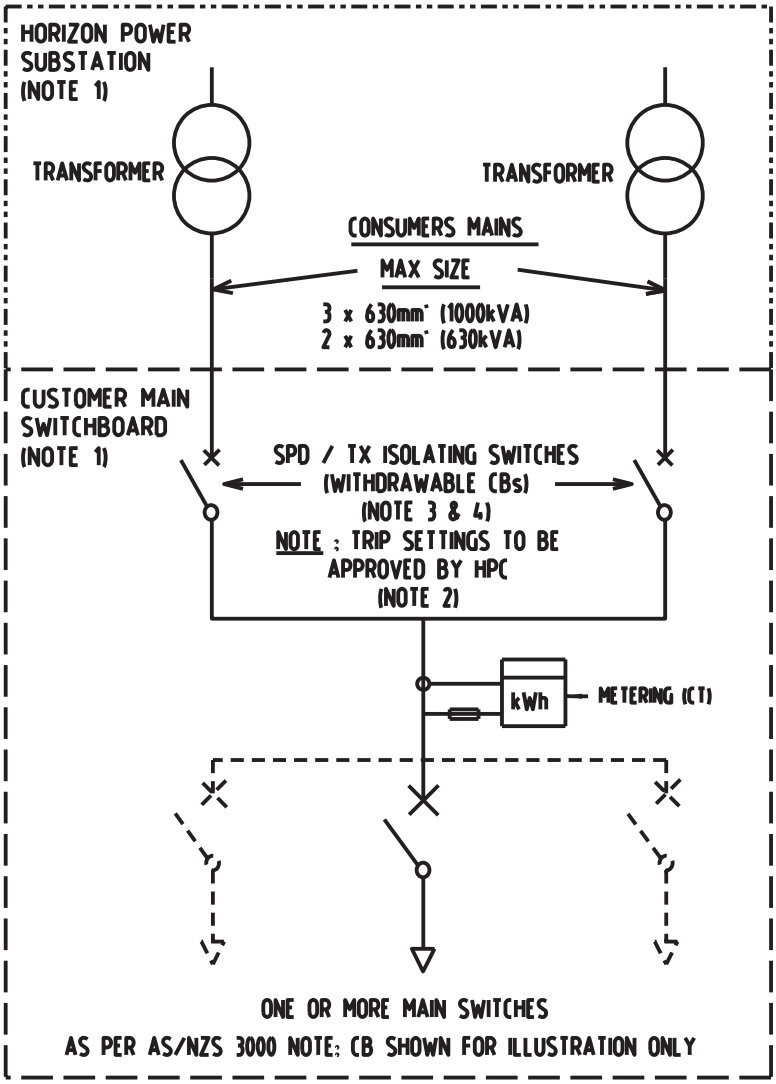



160/315/630 AND 1000kVA TRANSFORMERS

| TRANSFORMER SIZE (kVA) | MAX. CUSTOMER LOAD (A/ph) | CONSUMER MAINS MAXIMUM $mm^2$/PHASE |
|---|---|---|
| 25 (240V) | 63 (SINGLE ph) | 1 x 16 |
| 25 (480V) | 63 (TWO ph) | 1 x 16 |
| 63 | 82 | 2 x 25 |
| 160 | 210 | 1 x 630 |
| 315 | 415 | 2 x 630 |
| 630 | 825 | 2 x 630 |
| 1000 | 1310 | 3 x 630 |

NOTES:
1. CUSTOMER MAY HAVE ONE OR MORE MAIN SWITCHES AS PER AS/NZS 3000. CB SHOWN AS MAIN SWITCH(ES) - FOR ILLUSTRATION PURPOSE ONLY.
2. SUBSTATION AND CUSTOMER SWITCHBOARD TO BE CONTIGUOUS.
3. SPD DENOTES SERVICE PROTECTION DEVICE. IN SOLE USE TRANSFORMER ARRANGEMENTS FOR 160 UPTO 1000kVA, THE SPD IS ALSO USED AS THE TRANSFORMER ISOLATING SWITCH.
4. CT METERING REQUIRED FOR LOADS LARGER THAN 100 AMPS. LOADS EQUAL TOO OR LESS THAN 100 AMPS TO BE DIRECT METERED.
5. SPD MUST BE FAULT LIMITING TYPE AND RATED AT LEAST 25kA FOR TRANSFORMER SIZE 160kVA AND ABOVE.

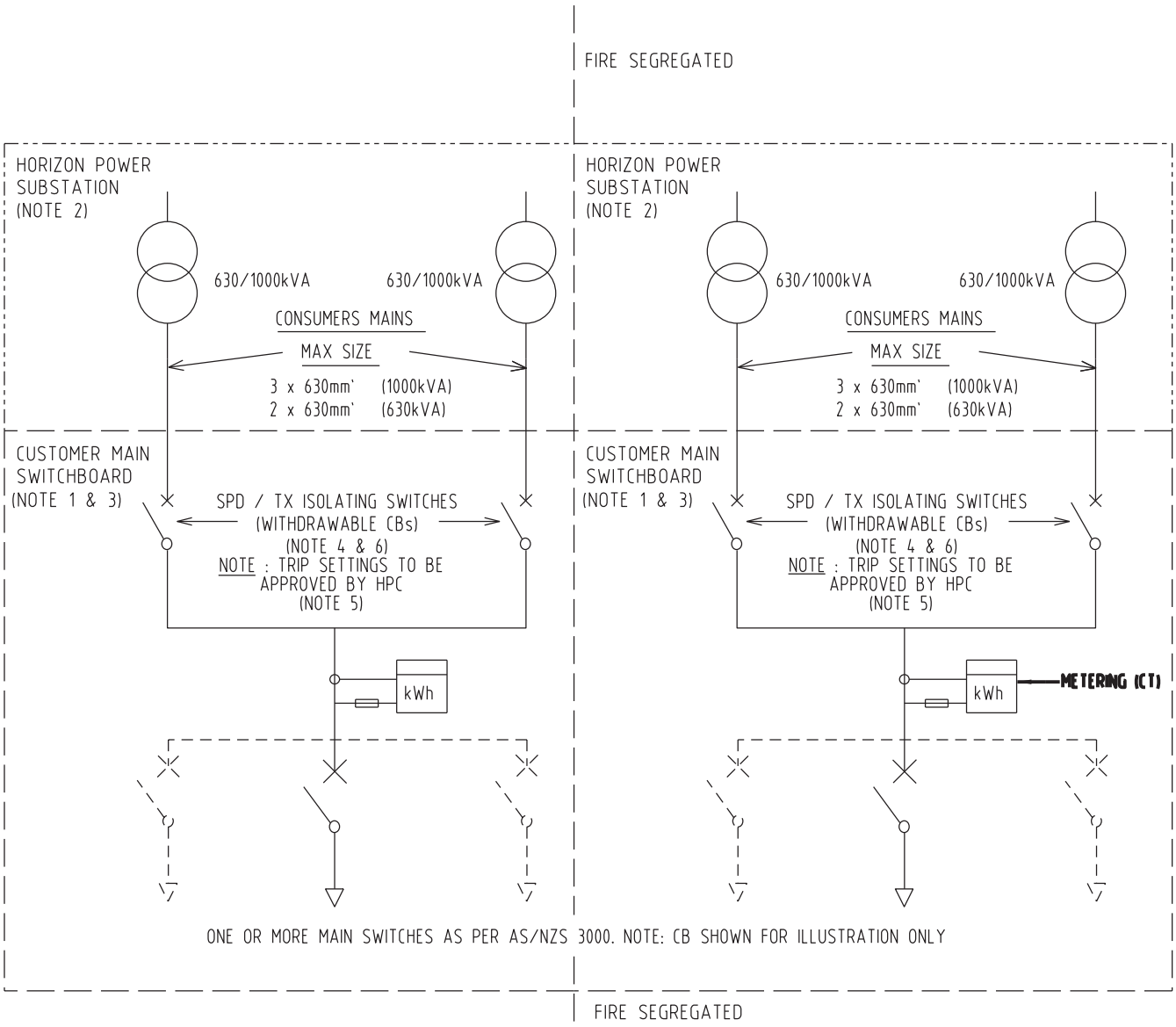
| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | | REVISION<br>B | DATE<br>JAN.18 |
| | SOLE USE SUBSTATION. DISCRETE LV LOAD UPTO 1310A CUSTOMER'S MSB CONTIGUOUS, CUSTOMER SUPPLIED FROM DEDICATED TRANSFORMER CUSTOMER CONNECTION ARRANGEMENTS | DRAWING No.<br>G1-7 | |




| TRANSFORMER SIZE (kVA) | MAX. CUSTOMER LOAD (A/ph) |
|---|---|
| 2 x 630 | 1655 |
| 2 x 1000 | 2625 |

NOTES:
1. SUBSTATION AND CUSTOMER SWITCHBOARD TO BE CONTIGUOUS
2. OVERLOAD TRIP ON CB MUST BE SET AT 1.25 TIMES THE RATED CURRENT OF THE TRANSFORMER 630kVA - 828 AMPS AND 1000kVA - 1313 AMPS
3. SPD DENOTES SERVICE PROTECTION DEVICE. IN SOLE USE TRANSFORMER ARRANGEMENTS, THE SPD IS ALSO USED AS THE TRANSFORMER ISOLATING SWITCH.
4. SPD MUST BE FAULT LIMITING TYPE AND RATED AT LEAST 50kA

| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | REFERENCE DRAWING | REVISION<br>B | DATE<br>JAN.18 |
| | SOLE USE SUBSTATION. DISCRETE LV LOAD UPTO 2625A CUSTOMER'S MSB CONTIGUOUS, CUSTOMER SUPPLIED FROM DEDICATED TRANSFORMER CUSTOMER CONNECTION ARRANGEMENTS | DRAWING No.<br>G1-8 | |




| TRANSFORMER SIZE (kVA) | MAX. CUSTOMER LOAD (A/ph) |
|---|---|
| 4 x 630 | 3310 |
| 4 x 1000 | 5250 |

NOTES:
1. SUBSTATION AND CUSTOMER SWITCHBOARD TO BE CONTIGUOUS.
2. COMMERCIAL CUSTOMERS CAN BE LV METERED IN 2MVA TRANSFORMER GROUPS AT ONE COMBINED LOCATION TO ALLOW FUTURE SUMMATION IF DESIRED.
3. PARALLELING OF 2MVA TRANSFORMER GROUPS SHALL BE PREVENTED BY MECHANICAL INTERLOCKING.
4. SPD DENOTES SERVICE PROTECTION DEVICE. IN SOLE USE TRANSFORMER ARRANGEMENTS, THE SPD IS ALSO USED AS THE TRANSFORMER ISOLATING SWITCH.
5. OVERLOAD TRIP ON CB MUST BE SET AT 1.25 TIMES THE RATED CURRENT OF THE TRANSFORMER 630kVA - 828 AMPS AND 1000kVA - 1313 AMPS.
6. SPD MUST BE FAULT LIMITING TYPE AND RATED AT LEAST 50kA.

HORIZON POWER

DISTRIBUTION CONSTRUCTION STANDARDS

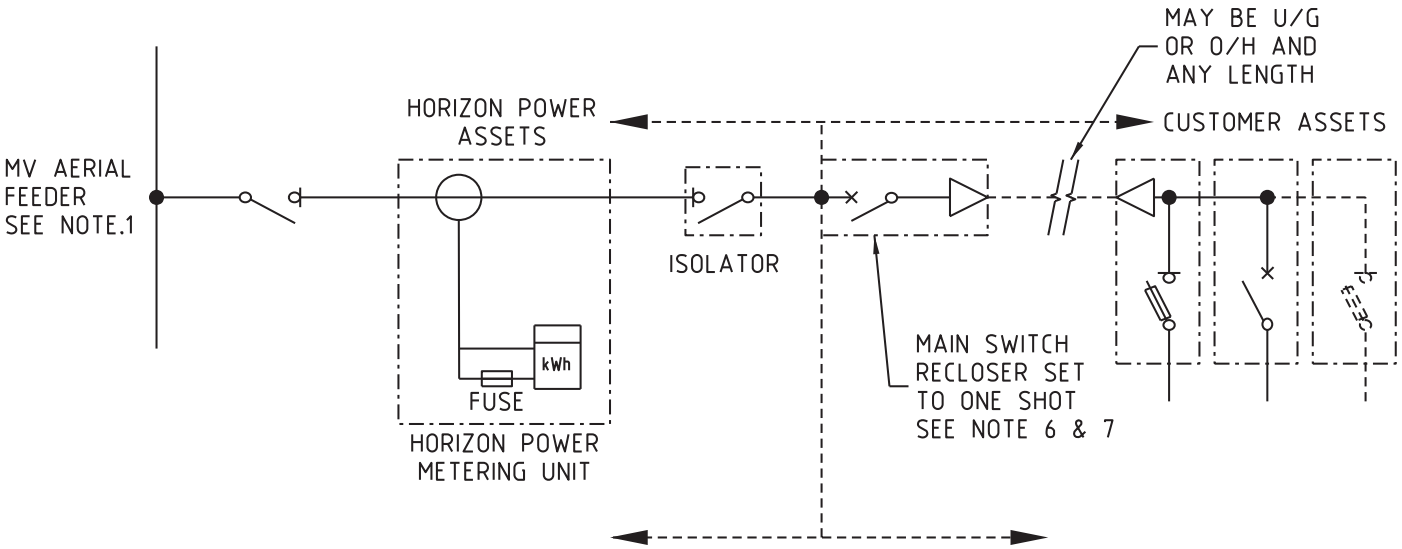
REFERENCE DRAWING

SOLE USE SUBSTATION. DISCRETE LV LOAD UPTO 5250A CUSTOMER'S MSB CONTIGUOUS, CUSTOMER SUPPLIED FROM DEDICATED TRANSFORMER CUSTOMER CONNECTION ARRANGEMENTS

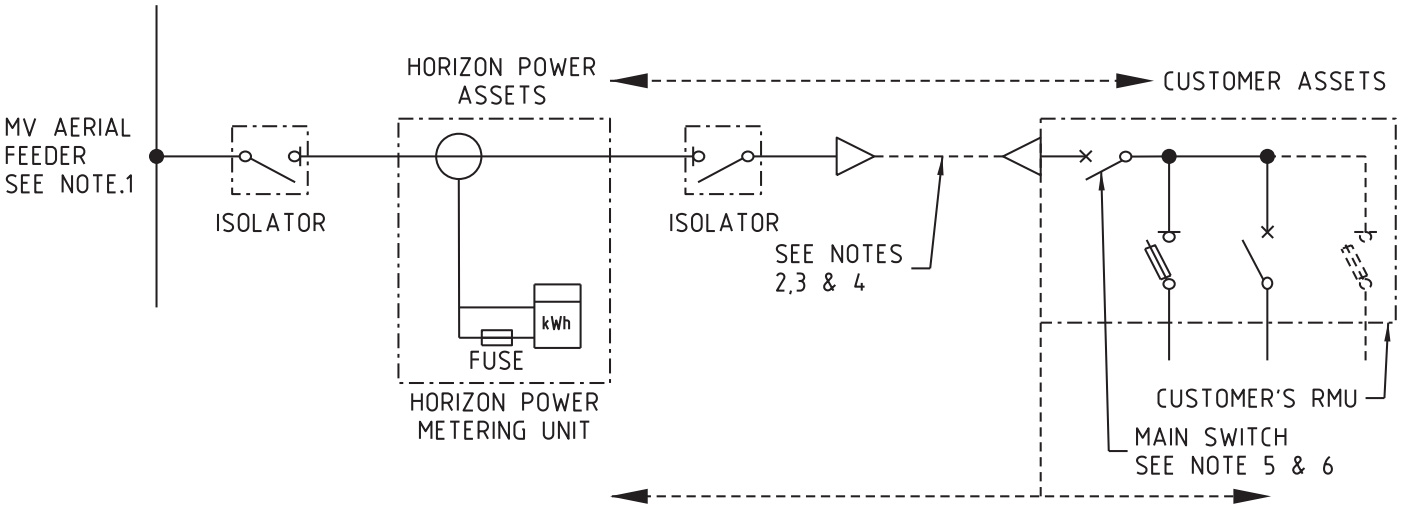
| REVISION | DATE |
|---|---|
| B | JAN.18 |

DRAWING No.

G1-9



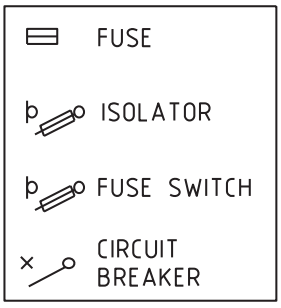

MV LINE WITH OVERHEAD METERING ARRANGEMENT - (FOR RURAL AREAS ONLY)



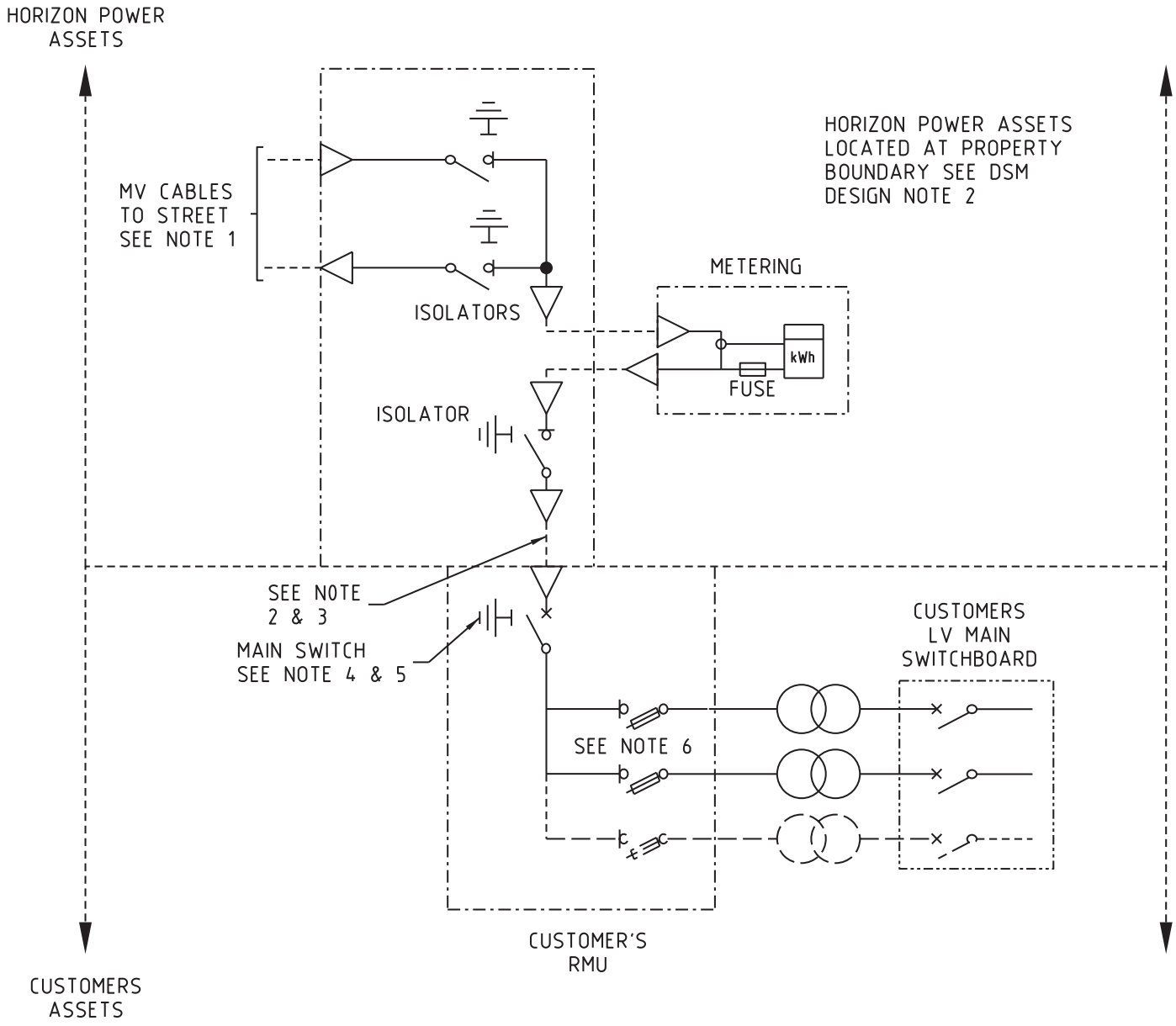

MV LINE WITH OVERHEAD METERING ARRANGEMENT - (FOR RURAL AREAS ONLY)
CUSTOMER GROUND MOUNTED EQUIPMENT (ALTERNATIVE ARRANGEMENT)

## NOTES:

1. INSTALLATION OF HORIZON POWER OVERHEAD ASSETS INSIDE PROPERTIES TO COMPLY WITH DM#2680337.
2. NETWORK CONNECTION TO BE SELECTED FROM G2 DRAWINGS BASED ON THE INSTALLED CAPACITY OF THE CUSTOMERS INTALLATION AND NETWORK VOLTAGE
3. HORIZON POWER ASSETS TO BE LOCATED WITHIN 30m OF PROPERTY BOUNDRY.
4. CABLE MUST BE AS SHORT AS POSSIBLE ( PREFERABLY LESS THAN 5m AND NOT MORE THAN 30m).
   OR SWITCH FUSES SEE SECTION 7 OF DISTRIBUTION DESIGN RULES.
5. CUSTOMER PROTTECTION SYSTEM MUST ALSO COMPLY WITH WAER, WADCM AND TECHNICAL RULES
6. CUSTOMER'S MAIN SWITCH MAY BE A CIRCUIT BREAKER OR SWITCH FUSES. SEE SECTION 7 OF DISTRIBUTION DESIGN RULES.



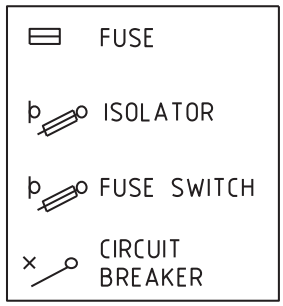

| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | REFERENCE DRAWING | REVISION<br>B | DATE<br>OCT.17 |
| | CUSTOMER OWNED SUBSTATION<br>MV METERING | DRAWING No.<br>G1-10/1 | |



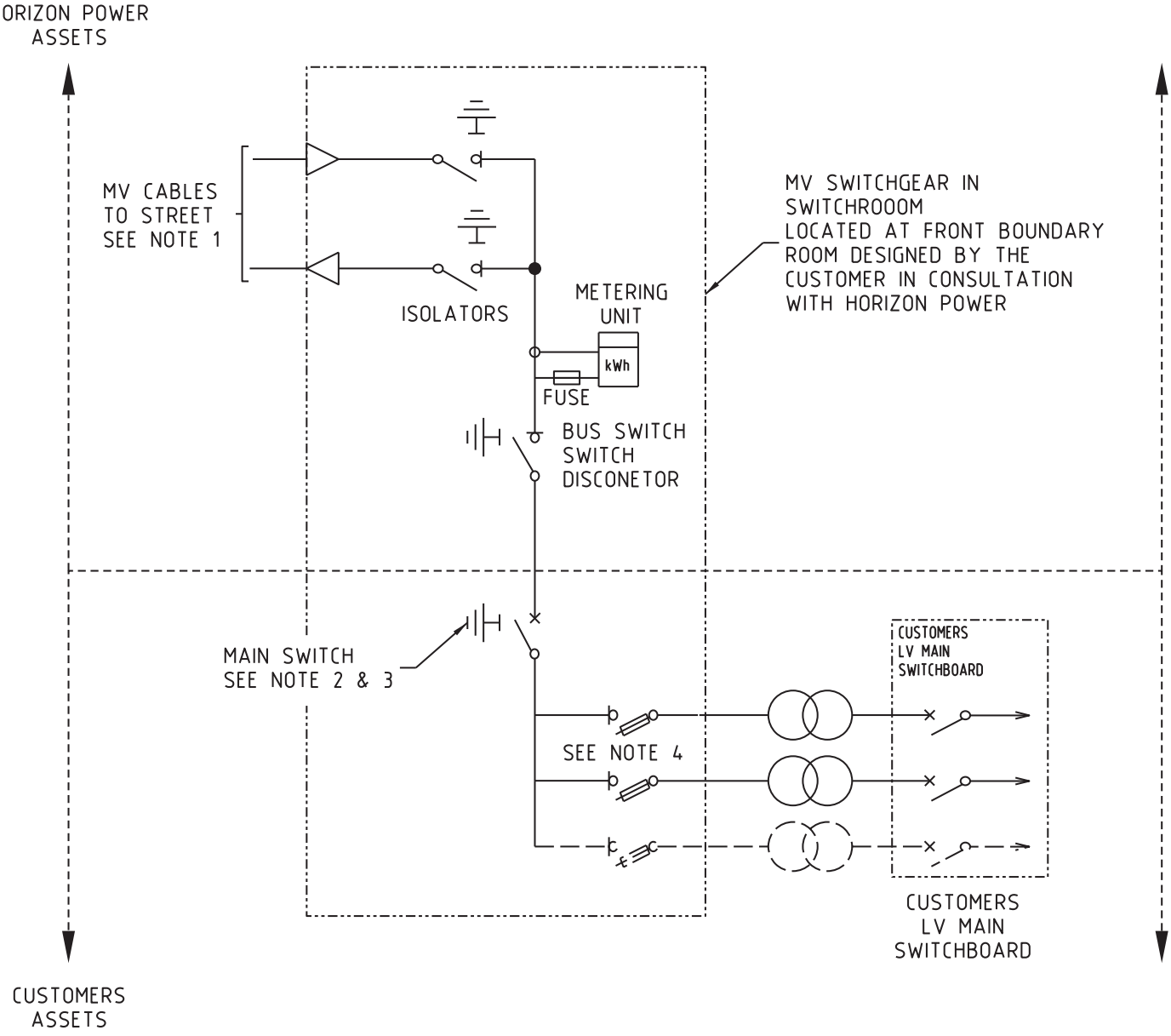

# MV GROUND MOUNTED OUTDOOR METERING ARRANGEMENT - ( FOR LOADS < 4MVA)

## NOTES:

1. NETWORK CONNECTION TO BE SELECTED FROM G2 DRAWINGS BASED ON THE INSTALLED CAPACITY OF THE CUSTOMERS INSTALLATION AND NETWORK VOLTAGE.
2. HORIZON POWER CABLE. CUSTOMER IS RESPONSIBLE FOR SUPPLY AND TERMINATION OF CABLE TERMINATION KIT ONTO THEIR EQUIPMENT.
3. HORIZON POWER ASSETS TO BE LOCATED WITHIN 30m OF PROPERTY BOUNDRY.
4. CUSTOMER'S PROTECTION SYSTEM MUST ALSO COMPLY WITH WAER, WADCM AND THE TECHNICAL RULES.
5. CUSTOMER MAIN SWITCH MAY BE A CIRCUIT BREAKER (FOR LOADS >1MW) OR SWITCH FUSES SEE SECTION 7 OF DISTRIBUTION DESIGN RULES.
6. CIRCUIT BREAKERS OR MULTIPLE SWITCH FUSES FOR TRANSFORMER PROTECTION.



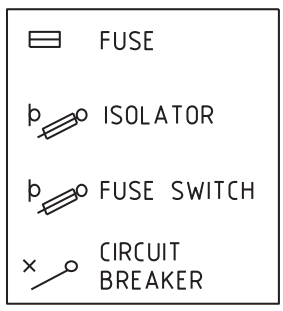

| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | REFERENCE DRAWING | REVISION<br>B | DATE<br>OCT.17 |
| | CUSTOMER OWNED SUBSTATION<br>MV METERING<br>GROUND MOUNTED OUT DOOR | DRAWING No.<br>G1-10/2 | |



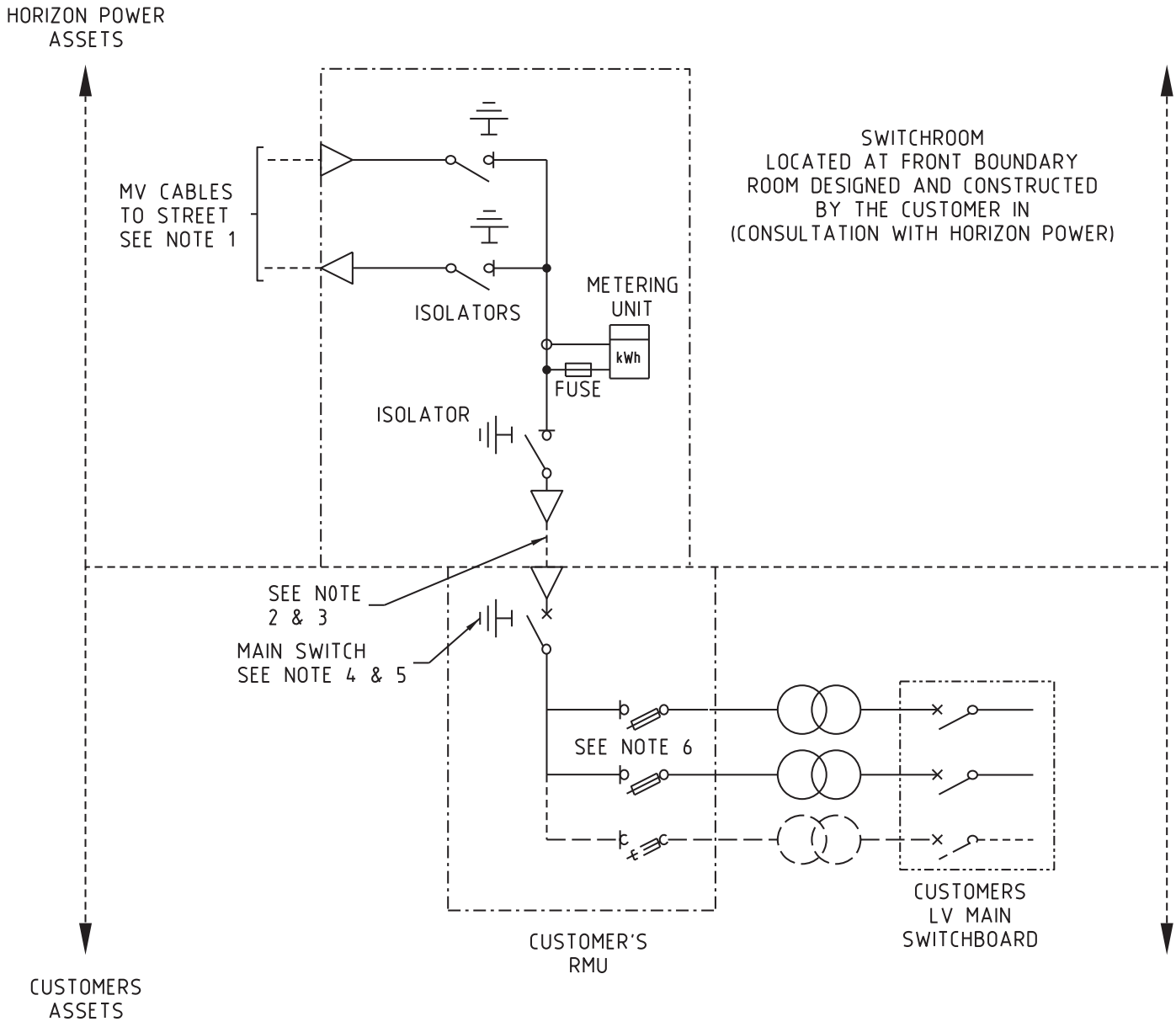

## HV METERING-DIRECT BUS CONNECTION TO CUTOMER (HORIZON POWER STANDARD RM6 EQUIPMENT)

### NOTES:

1. NETWORK CONNECTION TO BE SELECTED FROM G2 DRAWINGS BASED ON THE INSTALLED CAPACITY OF THE CUSTOMERS INSTALLATION AND NETWORK VOLTAGE.
2. CUSTOMER'S PROTECTION SYSTEM MUST ALSO COMPLY WITH WAER, WADCM AND THE TECHNICAL RULES.
3. CUSTOMER MAIN SWITCH MAY BE A CIRCUIT BREAKER FOR LOADS ≥1MW OR SWITCH FUSES SEE SECTION 7 OF DISTRIBUTION DESIGN RULES.
6. IF CUSTOMER'S MAIN SWITCH IS A CIRCUIT BREAKER THE CUSTOMER MAY HAVE CIRCUIT BREAKERS OR MULTIPLE SWITCH FUSES




| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | REFERENCE DRAWING | REVISION<br>B | DATE<br>OCT.17 |
| | CUSTOMER OWNED SUBSTATION<br>MV METERING<br>GROUND MOUNTED OUT DOOR | DRAWING No.<br>G1-10/3 | |

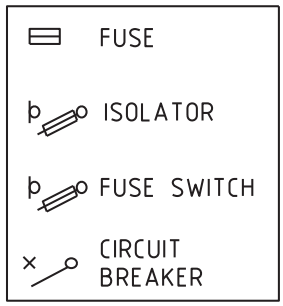



# MV METERING - CABLE CONNECTION TO CUSTOMER

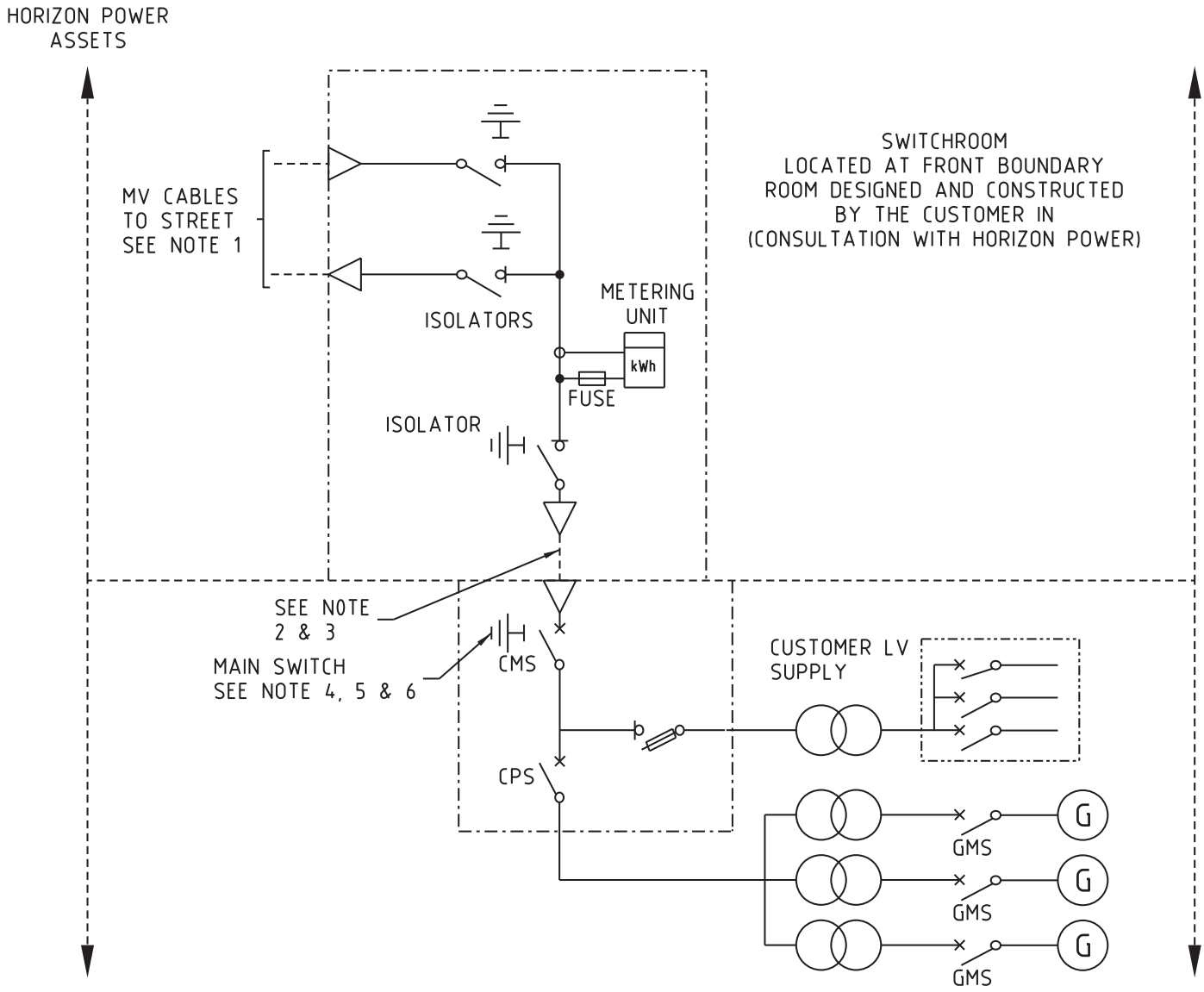
# WHEN CUSTOMER SWITCHGEAR IS NOT SCHNEIDER 22kV RM6 EXTENSIBLE TYPE)

## NOTES:

1. NETWORK CONNECTION TO BE SELECTED FROM G2 DRAWINGS BASED ON THE INSTALLED CAPACITY OF THE CUSTOMERS INSTALLATION AND NETWORK VOLTAGE.
2. HORIZON POWER CABLE. CUSTOMER IS RESPONSIBLE FOR SUPPLY AND TERMINATION OF CABLE TERMINATION KIT ONTO THEIR EQUIPMENT.
3. CABLE MUST BE AS SHORT AS POSSIBLE, AND MECHANICALLY PROTECTED. CUSTOMER TO PROVIDE SPARE DUCT.
4. CUSTOMER'S PROTECTION SYSTEM MUST ALSO COMPLY WITH WAER, WADCM AND THE TECHNICAL RULES.
5. CUSTOMER MAIN SWITCH MAY BE A CIRCUIT BREAKER (FOR LOADS >1MW) OR SWITCH FUSES SEE SECTION 7 OF DISTRIBUTION DESIGN RULES.
6. CIRCUIT BREAKERS OR MULTIPLE SWITCH FUSES FOR TRANSFORMER PROTECTION.



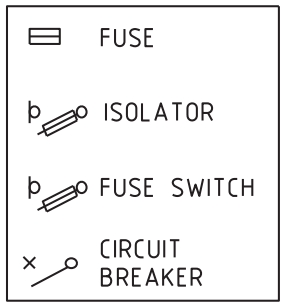

| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | REFERENCE DRAWING | REVISION<br>C | DATE<br>OCT.18 |
| | CUSTOMER OWNED SUBSTATION MV METERING GROUND MOUNTED OUT DOOR CABLE CONNECTED (HP PREFERED ARRANGEMENT) | DRAWING No.<br>G1-10/4 | |



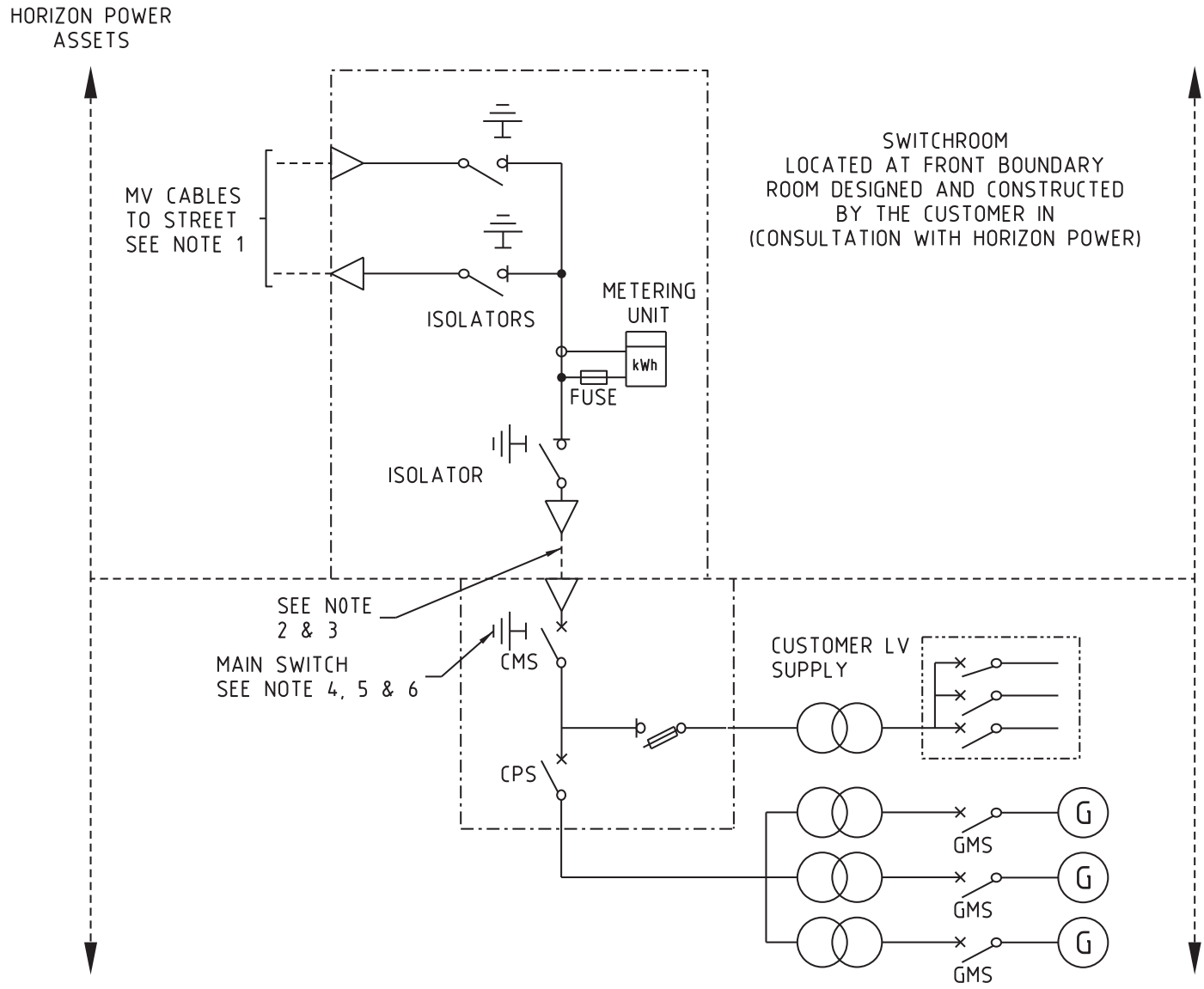

CMS - CUSTOMER MAIN SWITCH
CPS - CUSTOMER PARELLELING SWITCH
GMS - GENERATOR MAIN SWITCH

## NOTES:

1. NETWORK CONNECTION TO BE SELECTED FROM G2 DRAWINGS BASED ON AGGREGATE RATED CAPACITY OF THE CUSTOMERS GENERATORS AND NETWORK VOLTAGE.
2. HORIZON POWER CABLE. CUSTOMER IS RESPONSIBLE FOR SUPPLY AND TERMINATION OF CABLE TERMINATION KIT ONTO THEIR EQUIPMENT.
3. CABLE MUST BE AS SHORT AS POSSIBLE, AND MECHANICALLY PROTECTED. CUSTOMER TO PROVIDE SPARE DUCT.
4. CUSTOMER'S PROTECTION SYSTEM MUST ALSO COMPLY WITH WAER, WADCM AND THE TECHNICAL RULES.
5. MAIN SWITCH MUST BE A CIRCUIT BREAKER.
6. REFER TO HORIZON POWER TECHNICAL RULES (HPC-9DJ-01-0001 - 2012) AND TECHNICAL REQUIRMENTS FOR TRANSFER (HPC-90J-13-00010 2012. FOR THE CONNECTION OF GENERATORS OF UPTO 10MW TO HORIZON POWER DISTRIBTUION NETWORK AND DESIGN OF PROTECTION SYSTEM.



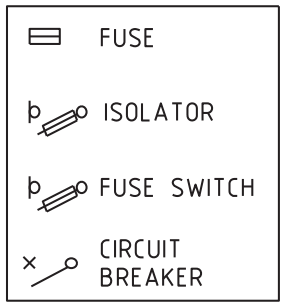

| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | REFERENCE DRAWING | REVISION<br>B | DATE<br>JAN.18 |
| | CUSTOMER OWNED SUBSTATION MV METERING<br>GROUND MOUNTED INDOOR<br>WITH CUSTOMER GENERATOR | DRAWING No.<br>G1-10/5 | |




CMS - CUSTOMER MAIN SWITCH
CPS - CUSTOMER PARELLELING SWITCH
GMS - GENERATOR MAIN SWITCH

## NOTES:

1. NETWORK CONNECTION TO BE SELECTED FROM G2 DRAWINGS BASED ON AGGREGATE RATED CAPACITY OF THE CUSTOMERS GENERATORS AND NETWORK VOLTAGE.
2. HORIZON POWER CABLE. CUSTOMER IS RESPONSIBLE FOR SUPPLY AND TERMINATION OF CABLE TERMINATION KIT ONTO THEIR EQUIPMENT.
3. CABLE MUST BE AS SHORT AS POSSIBLE, AND MECHANICALLY PROTECTED. CUSTOMER TO PROVIDE SPARE DUCT.
4. CUSTOMER'S PROTECTION SYSTEM MUST ALSO COMPLY WITH WAER, WADCM AND THE TECHNICAL RULES.
5. MAIN SWITCH MUST BE A CIRCUIT BREAKER.
6. REFER TO HORIZON POWER TECHNICAL RULES (HPC-9DJ-01-0001 - 2012) AND TECHNICAL REQUIRMENTS FOR TRANSFER (HPC-90J-13-00010 2012. FOR THE CONNECTION OF GENERATORS OF UPTO 10MW TO HORIZON POWER DISTRIBTUION NETWORK AND DESIGN OF PROTECTION SYSTEM.




| | | | |
|---|---|---|---|
| HORIZON POWER<br>DISTRIBUTION CONSTRUCTION STANDARDS | REFERENCE DRAWING | REVISION<br>B | DATE<br>JAN.18 |
| | CUSTOMER OWNED SUBSTATION<br>MV METERING<br>GROUND MOUNTED INDOOR<br>WITH CUSTOMER GENERATOR<br>(ALTERNATIVE ARRANGEMENT) | DRAWING No.<br>G1-10/6 | |