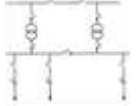




DISTRIBUTION COMMISSIONING TEST SHEET – DISTRIBUTION SUBSTATION (FIRE RATED)
HPC-4DL-07-0002-2014



This commissioning test sheet covers the checking that must be undertaken on all new distribution substations contained in buildings.

- NOTE:** Tests must be carried out after the installation.
SAFETY: At all times maintain suitable clearance to all other electrical equipment and verify planned escape routes. In preparation for the checks, wherever possible make the area safe.

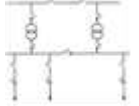
| | | | | | |
|------------------|--|--------------------|--|------------------------|--|
| DATE: | | Project No. | | Name of Officer | |
| Location: | | | | | |

1. VISUAL INSPECTION AND SAFETY CHECK (SUBSTATION ACCESS)

| | | |
|---|---|--------------------------|
| 1 | Check that the installation complies with the distribution construction standards and applicable design drawings (especially correct orientation as per DSM 3). | <input type="checkbox"/> |
| 2 | Check that the area immediately around the substation is level as per design and suitable for heavy vehicles to access. | <input type="checkbox"/> |
| 3 | Check that there is sufficient clearance to allow the installation of distribution transformer (size – 1.5 m high, 1.9 m wide and 1.6 m long, weighing 5,000 kg). | <input type="checkbox"/> |
| 4 | Check that there is 24 hr/day & 7 days/wk access for Horizon Power staff and equipment. | <input type="checkbox"/> |
| 5 | When the substation is contained within another building, requiring gatic access for the installation and removal of power equipment, that the gatic opening dimensions have minimum clearances of 2.5 x 2 m. | <input type="checkbox"/> |
| 6 | Check that substations with gatic access have a minimum clear ceiling height of 3.3 m above the gatic cover and access for a crane from street. | <input type="checkbox"/> |
| 7 | For sole-use substations, check that the substation is not more than 30 m from the street boundary. | <input type="checkbox"/> |

2. VISUAL INSPECTION AND SAFETY CHECK (SUBSTATION BUILDING)

| | | | |
|---|--|------------------------------|--------------------------|
| 1 | Check that Public Safety has been considered (e.g. doors secured and locked, trip hazards removed where applicable). | | <input type="checkbox"/> |
| 2 | Check that the substation Foundation Floor Level (FFL) is 1 m above the 100 year flood levels and not lower than the finished level of surrounding lots and adjacent road carriageways. (Only applies if site is pegged) | N/A <input type="checkbox"/> | <input type="checkbox"/> |
| 3 | Check that if substation is located in trafficable areas, suitable protective structures are installed to protect substation and operational personnel. | N/A <input type="checkbox"/> | <input type="checkbox"/> |
| 4 | Check that the substation has been suitably constructed (i.e. brick/concrete walls) and that there is no visible deterioration of the structure. | | <input type="checkbox"/> |
| 5 | Check that the door(s) fits correctly into door frames and that the doors swing smoothly, opening to the outside but not into trafficable areas. | | <input type="checkbox"/> |
| 6 | Check that the door(s) are fitted with a panic release lever and a Lockwood night latch containing Horizon Power's barrel. | | <input type="checkbox"/> |



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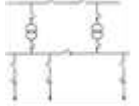
| | | | |
|----|---|------------------------------|--------------------------|
| 7 | Check that door(s) and vent(s) are suitable situated as to prevent the ingress of water into building. | | <input type="checkbox"/> |
| 8 | Check that the ceiling height is more than 2.5 m (or 3 m if exhaust ducts pass over indoor switchgear). | | <input type="checkbox"/> |
| 9 | Check that roof is dust tight, and that suitable storm water guttering has been installed. Note: downpipes to terminate either in soak wells or ensure that storm water is directed away from substation. | | <input type="checkbox"/> |
| 10 | Check that the trenches are installed in accordance with approved drawings (refer to DSM 3). | | <input type="checkbox"/> |
| 11 | Check that the trenches are 1.2 x 1.2 m with walls and floors painted with silicon glaze waterproof paint. | | <input type="checkbox"/> |
| 12 | Check that the trenches have two 75 mm conduits installed as far apart as possible for earth rods. | | <input type="checkbox"/> |
| 13 | Check that the trenches are equipped with cable pulling eyes if enclosure more than 20 m from street boundary. | | <input type="checkbox"/> |
| 14 | Check that the trenches are equipped with trench covers and applicable supports to prevent covers from unassisted movement. | | <input type="checkbox"/> |
| 15 | Check that the duct installed are in accordance with drawings, with a minimum cover of 750 mm. | | <input type="checkbox"/> |
| 16 | Check that all ducts and penetrations entering each enclosure are fitted with removable water tight and fire retardant seals. | | <input type="checkbox"/> |
| 17 | Check that all vents are fitted with external louvers. | | <input type="checkbox"/> |
| 18 | Check that force draught ventilation (exhaust fans), are installed correctly (if applicable). | N/A <input type="checkbox"/> | <input type="checkbox"/> |
| 19 | Check that aisles are at least 750 mm wide whilst 600 mm (minimum) is allowed for evacuation around all equipment (includes doors being open). | | <input type="checkbox"/> |
| 20 | Check that all necessary lighting, GPO's and minor wiring is installed in sole use and customer owned substations. | | <input type="checkbox"/> |
| 21 | Check that there are no other services installed within the enclosures | | <input type="checkbox"/> |

3. VISUAL INSPECTION AND SAFETY CHECK (FIRE PROTECTION & OIL CONTAINMENT)

| | | |
|---|---|--------------------------|
| 1 | Check that the building (design/drawings) is rated at a minimum of FRL 120/120/120. Double clay bricks on concrete footing or 150 mm solid concrete blocks. | <input type="checkbox"/> |
| 2 | Check that the floors and roofs/ceiling are reinforced concrete not less than 100 mm thick. | <input type="checkbox"/> |
| 3 | Check that the doors and all hardware are 2 hours fire rated. | <input type="checkbox"/> |



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| | | |
|---|--|--------------------------|
| 4 | Check that self-closing fire dampened vents are installed. | <input type="checkbox"/> |
| 5 | Check that a fire alarm is installed (thermal rate of rise detectors as a minimum). | <input type="checkbox"/> |
| 6 | Check that if an extinguishing system has been installed, that is of the dry head type. | <input type="checkbox"/> |
| 7 | A 75 mm high brick bund has been installed across doorways after the installation of the transformers. | <input type="checkbox"/> |

4. VISUAL INSPECTION AND SAFETY CHECK (CONSUMER MAINS AND MAIN SWITCHES)

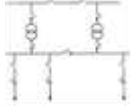
| | | | |
|---|---|---------------------------|-----------------|
| 1 | Check that the consumer mains is correct for the installation. | <input type="checkbox"/> | |
| 2 | Check if the main switchboard is contiguous as required by load. | <input type="checkbox"/> | |
| 3 | Check that mechanical interlocking has been provided where necessary. | <input type="checkbox"/> | |
| 5 | Is protection setting information provided? <input type="checkbox"/> Yes <input type="checkbox"/> No If "No" then record settings in Section 7 or take a photo of customer's main switch and send for verification. | <input type="checkbox"/> | |
| 6 | For customer-owned substations, if switchgear is not standard, has the customer provided switchgear test certificates? | <input type="checkbox"/> | |
| 7 | For HV customers, has customer's switching operator been nominated? | Switching Operator's Name | Contact Details |

5. VISUAL INSPECTION AND SAFETY CHECK (LABELLING AND SIGNAGE)

| | | |
|---|--|--------------------------|
| 1 | Check that the correct Labels (substation name, location) and Danger Signs have been attached to all the access doors. | <input type="checkbox"/> |
| 2 | Check that the correct Labels and Danger Signs have been attached to switchgear, transformers and other equipment. | <input type="checkbox"/> |
| 3 | Check that Labels and Signs relating to emergency, evacuation and fire equipment have been properly and prominently placed to be clearly seen. | <input type="checkbox"/> |



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6. OPERATIONAL HANDOVER

The commissioning officer must ensure that all checks are completed and the test results comply with the minimum standards.

I hereby certify that all sections have been completed with satisfactory results and transfer responsibility to the network operating authority. This equipment is ready to be **SAFELY** energised.

Commissioning Officer: _____ Pay Number: _____
 Signature: _____ Date: _____ DD/MM/YY Time: _____ HH:MM

1. Ensure the work area is left tidy with no hazards to the public.
2. Hand over responsibility to the operating authority
3. This sheet is a record of commissioning is required for the Handover Certificate.
4. Attach as-built drawings and datasheets to this sheet and send to relevant regional asset manager.

7. RECORD OF PROTECTION SETTINGS (IF APPLICABLE)

| | | | | |
|-----------------------------------|--|-----------|--|-----------------------|
| Over Current (O/C) Setting | | | | |
| Pick Up Current | | Trip Time | | Instantaneous Pick Up |
| Earth Fault Current (E/F) Setting | | | | |
| Pick Up Current | | Trip Time | | Instantaneous Pick Up |
| Any Other Settings | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |

IMPORTANT: PLEASE ATTACH AS-BUILT DRAWINGS AND DATASHEETS TO THIS SHEET AND SEND TO RELEVANT ASSET MANAGER