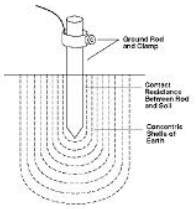
DISTRIBUTION COMMISSIONING FORM (DCF) 4.1 – High voltage earthing system resistance testing (All equipment)



Purpose: This form covers testing of the earth resistance of electrodes or earths for HV only systems (e.g., RMU) or combined HV-LV earthing systems (e.g., transformers).

Note: The following tests must be carried out on all replacements or new installations before they are put into service.

For more information refer to the *Distribution Commissioning Forms Manual (EDM 34137510) and Maintaining and replacing down earth assemblies Work Instruction (EDM 41862205).*

Address/Pole No.			
Work Package No.		**SPIDAWeb Pick ID:**	

1. Pre-Test Checks

Visual inspection	Rated system voltage			Volts	
	Equipment being protected by the earth system (e.g., transformer, pole-top switch)				
	No. of earth electrodes per earthing point			#	
	Approximate depth of earth electrodes	A	B	Meters	
	Size of earth cables			mm^2	
	Check that the earth conductors are correctly installed to the earth bar (if applicable) and that there are no signs of damage.				
	Check that the earth electrodes are properly installed and connected to the earth system by earth conductors (Refer to DCSH/DSPM).				
	Check that the earth pits are properly installed, access to the earth electrode is possible and the earth pit lids are in good condition (if applicable).			N/A	
	Check that the compound earth grid is bonded to the substation screening fence (not a customer property bounded fence) and connected to a MEN / N–E connections or earth terminals bar (if applicable).			N/A	

2. Earthing System Resistance Test

Fall of potential method	Test Equipment: Earth Resistance Tester (three-pole fall of potential method)											
	The earth electrode under test (electrode 1) must be disconnected from the earthing system. Refer to Sect 4.1.4 in the *Distribution Commissioning Forms Manual (EDM 34137510)* for the test method.											
Test results	First Test Initiate test: Electrode 2 at C metres Electrode 3 at 0.62C metres Record value:				Second Test Reposition electrode 3: + 3 metres from initial position Record value:				Third Test Reposition electrode 3: - 3 metres from initial position Record value:			
	A	Ω	**B**	Ω	**A**	Ω	**B**	Ω	**A**	Ω	**B**	Ω
	Average the value of the three tests and record.							Ω				

	Description	Maximum Allowable Resistance
Acceptable values (Distribution Substation Manual)	Disconnected Earth Electrode for overhead apparatus (ref DCSH): i.e., Transformer tank and LV neutral; Cable termination; PTS; Switchgear	less than 30 Ω
	Disconnected Earth Electrode: Underground system (ground mounted equipment) (each electrode) i.e., Pad-mounted transformer (each electrode); RMU	less than 10 Ω
	Connected Earth Electrode: Combined HV-LV earthing system (e.g., transformers)	less than 1 Ω

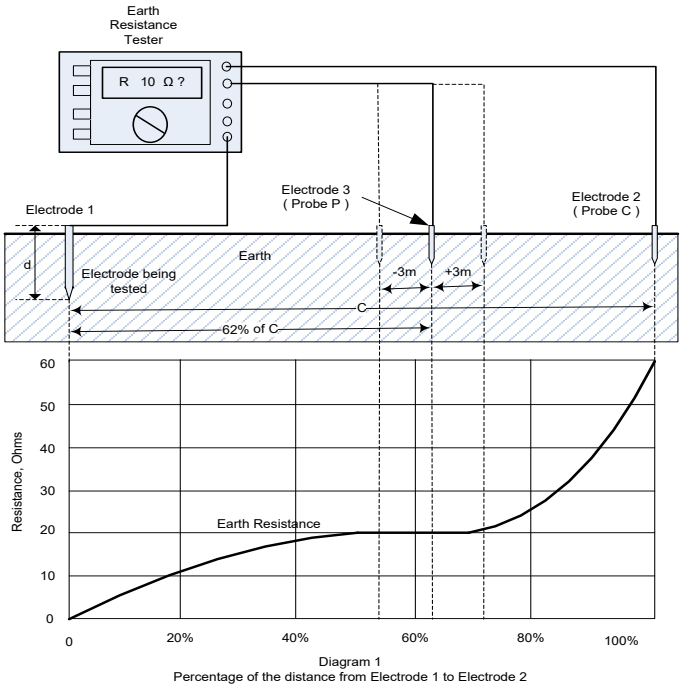


Diagram 1
Percentage of the distance from Electrode 1 to Electrode 2

ELECTRODE DEPTH	Test Lead lengths from Earth Electrode	
	Potential Probe (P)	Current Probe (C)
<15m	30m	50m
15 - 30m	60m	100m
30 - 45m	90m	150m
45 - 60m	120m	190m
60 - 75m	150m	240m
75 - 100m	200m	320m

Straight line probe spacing table 1 (Western Power Network)

3. Handover of Responsibility

I hereby certify that all items have been completed with satisfactory results and transfer control to the network operating authority.			
Tested by		BNA	
Signature		Date & Time	

Notes: Bolts and screws in all electrical connections across the Western Power network must be properly tightened. All lug crimps confirmed intact visually or with a pull test.

1. Ensure the work area is left tidy and no hazards to the public.
2. Hand over responsibility to the operating authority.
3. The completed form must be returned to the project file/work pack.