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NSP/004/102 - (OHI 2) Guidance on Erecting Single or 'H' Poles

1. Purpose

The purpose of this document is to describe the approved techniques for the handling and erection of wood and steel poles for use on the Northern Powergrid Distribution System.

This document supersedes the following documents, all copies of which should be destroyed.

Document Reference	Document Title	Version	Published Date
NSP/004/102	NSP/004/102 - (OHI 2) Guidance on Erecting Single or 'H' Poles	2.1	Feb 2019

2. Scope

This document has been prepared to provide guidance on pole handling and erection techniques. It provides high level guidance on the allowable techniques available for pole erection. More detailed guidance on the specific techniques can be found in the approved work instruction or task instruction. Although there are a number of manual Northern and Yorkshire legacy procedures for the erection of poles the use of mechanical means are preferred as listed below:

RTN/500/740/023 – Method Statement for the Installation of Single, 'H' or 'A' Poles using a Vehicle Mounted Crane.

RTN/500/740/020 – Method Statement for the Installation of Single Wood Poles using a Push up Method with Tracked or Wheeled Excavator.

RTN/500/740/009 – Method Statement for the Installation of Single Wood Poles using a 'Strimech' or 'Roche' Pole Handler.

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3. Technical Specification

3.1. Background

Due to the weights and dimensions of poles they are difficult to handle and pose a safety risk to staff and public in the general location where work is being carried out. The adoption of approved techniques, utilisation of trained staff and undertaking risk assessments minimise the potential for mishaps to occur.

3.2. Task and Site Preparation

All work shall be carried out in accordance with the Northern Powergrid Distribution Safety Rules, Operational Practice Manual and applicable safety policy. Health and Safety regulations that relate to these procedures are:

- Health & Safety Guidance Note 47 “Avoiding Danger from Underground Services”
- Safety Guidance Note GS6 – “Avoiding Danger from Overhead Power Lines”

When selecting the method to be utilising for moving and erecting the pole it is preferable to use approved mechanical aids as opposed to manual or labour intensive methods.

3.3. Tools & Equipment

Only approved tools and equipment shall be used. A visual inspection of all lifting equipment shall be carried out before use checking to make sure the colour code safety inspected markings are within the valid test period. Choose lifting equipment with a SWL to suit the total weight being lifted, typical weights (for guidance only) for poles and steelwork arrangements are shown in the table in section 3.3 of this document.

3.4. Typical Equipment and Pole Weights

Steelwork Weights (examples)

Type of Support	Weight (Kg)
Single crossarm intermediate	60
Double crossarm intermediate	110
Double crossarm section / terminal	120
Narrow “H” pole section steelwork	120
Wide “H” pole section steelwork	140
33kV Terminal steelwork	200

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Typical Pole Weights

Wood Poles

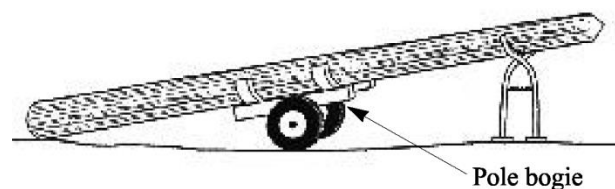
Length (Metres)	Light (Kg)	Med (Kg)	Med/Stout (Kg)	Twin Bolted Med (Kg)	Stout (Kg)	Extra Stout (Kg)	Stout Rutter (Kg)
8.0	143						
8.5	157	213			305		
9.0	163	229			335		
9.5	183	249			371		
10.0	198	259	335	495	395	427	
10.5	213	284			427	498	
11.0	234	310	380	535	472	528	
11.5	264	335			498	569	
12.0	284	356	480	650	539	620	1328
13.0	315	417	560	735	599	671	1448
14.0		467			686	762	1622
15.0		554			762	859	1774
16.0		630			848	928	1946
17.0		721			950	1070	2150
18.0		828			1110	1129	
20.0		996			1340	1331	
22.0		1110			1550	1642	
24.0					1630		

Steel Poles

Length (Metres)	Weight (Kg)
9.75	644
10.75	750

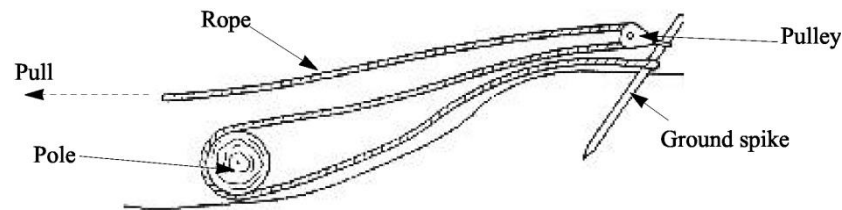
3.5. Lifting and Moving Poles

When moving poles to the position where it is to be erected mechanical aids are preferred with manual movement utilised as a last resort. When a pole is pulled behind a vehicle it shall be fitted to a pole bogie as shown below.

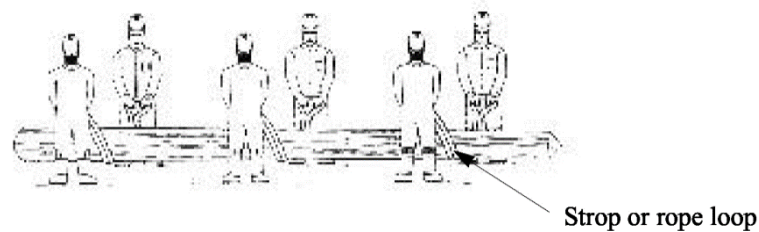


Poles can be manoeuvred manually with the use of ground spikes and rope blocks as shown below.

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When lifting by hand use as many members of the team as possible and use rope loops or slings to keep your fingers and hands free from trapping. Always have only one person in control of the lift to call out lifting instructions.



3.6. Pole Erection Techniques

Poles shall be erected by one of the following preferred methods:

RTN/500/740/023 – Method Statement for the Installation of Single, 'H' or 'A' Poles using a Vehicle Mounted Crane.

RTN/500/740/020 – Method Statement for the Installation of Single Wood Poles using a Push up Method with Tracked or Wheeled Excavator.

RTN/500/740/009 – Method Statement for the Installation of Single Wood Poles using a 'Strimech' or 'Roche' Pole Handler.

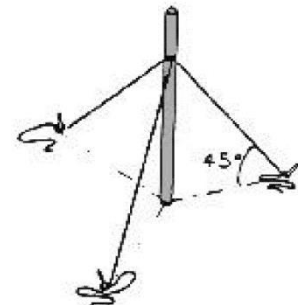
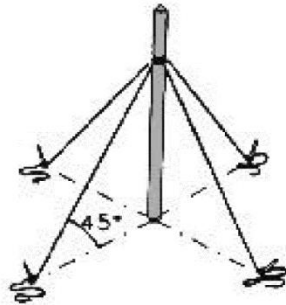
The table below lists the historic work instructions used within the legacy Northern and Yorkshire areas when manually erecting poles. Although the methods listed above are preferred there will be instances when site and access restrictions make it impossible or not practical to use mechanical methods.

Pole Erection Method	Limitations	Yorkshire Task/Work Instruction	Northern Task/Work Instruction
Falling Derrick	Suitable for erecting single poles with maximum combined pole/steelwork weights of 1000kg	WI 74-02	04/010
Pike Method	Suitable for erecting single poles sizes up to 12m Medium Grade	WI 74-03	04/011
Shear Legs (Swedish Lifter)	Suitable for erecting single poles with a maximum combined pole/steelwork weights of 350kg	-	04/012
Falling Derrick 'H' Pole	Suitable for erecting 'H' poles with maximum combined pole/steelwork weights of 1000kg (14m Medium grade)	WI 74-07	04/013
Falling Derrick 'H' Pole or Gin Pole	Suitable for erecting 'H' poles with maximum combined pole/steelwork weights of 3000kg (20m Stout grade)	WI 74-08	04/014
Via Existing Pole	Suitable for erecting single or 'H' poles with maximum combined pole/steelwork weights of 1000kg.	-	04/018

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Securing a Pole

When securing a pole during erection use four guy ropes evenly spaced (at 90° intervals) around the pole. If this is not possible or practicable then use three guy ropes at (at 120° intervals).



Wherever possible attach guy ropes to the pole before it is erected. If you need to attach guy ropes to the pole after erection use a hydraulic bucket lift as a means of access and attach the guy ropes at height or, use a 'rope support' attachment for live line tapping sticks and follow the procedure below.

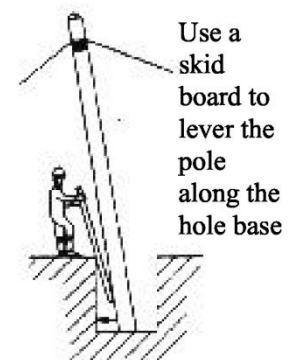
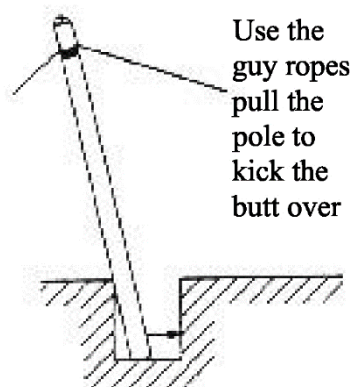
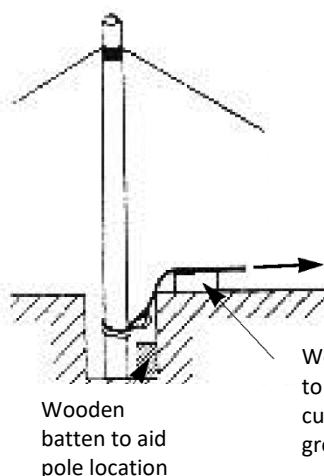
1. Tie one end of the rope loosely around the base of the pole using a running bowline.
2. Rest the rope in the guides of the support and attach the support to the tapping sticks.
3. Raise the rope to the desired height and pull the free end of the rope, tightening the guy rope knot around the pole.
4. Release the rope support and make off the guy to its anchor.
5. Repeat as necessary.

3.7. Pole Alignment Techniques

Following the erection of the pole, care shall be taken to ensure that the pole is vertical and in line with the overhead line route. After aligning of the pole, the pole shall be temporarily supported to prevent movement until the excavation is reinstated.

Aligning the Pole

Always use a mechanical pole handler as the preferred method of adjustment following the appropriate work instruction. Where this is not practical the manual methods is detailed below:



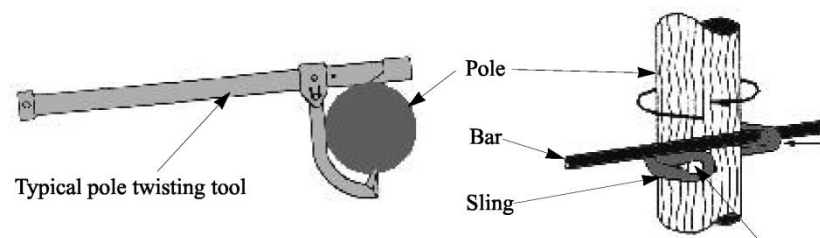
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Plumbing the Pole

It is preferable to plumb a pole before the hole is backfilled to ensure that the backfill at the base of the pole is correctly compacted. If after backfilling the pole it is found not to be plumb, then excavate the ground around the pole to a depth of at least 600mm, loosen the soil below this level around the pole base and attach guy ropes to secure the pole whilst plumbing. Care must be taken to ensure that the pole is not unduly stressed whilst it is straightened to a vertical position.

Twisting a Pole

The installed pole shall have the pole top steelwork or fittings aligned with the conductors as shown in the appropriate arrangement drawing. This shall be achieved using either the pole twister or the bar and sling method shown below:



If the pole is fitted with kicking blocks they must be fully excavate before attempting to twist the pole. If the pole is to be twisted after backfilling then only use the bar and sling method as this is less damaging to the pole.

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4. References

The requirements described within this specification shall comply with the latest versions of the relevant International Standards, British Standard Specifications, Energy Network Association Technical Specifications (ENATS) and Northern Powergrid policy documentation.

4.1. External Documentation

Reference	Title
HSG47	Health & Safety Guidance Note - Avoiding Danger from Underground Services
HSGS6	Health & Safety Guidance Note - Avoiding Danger from Overhead Power Lines

4.2. Internal Documentation

Reference	Title
NSP/004/112	Guidance for the Inspection and testing of Wood and Steel Poles.
RTN/500/740/009	Method Statement for the Installation of Single Wood Poles using a 'Strimech' or 'Roche' Pole Handler.
RTN/500/740/020	Method Statement for the Installation of Single Wood Poles using a Push up Method with Tracked or Wheeled Excavator.
RTN/500/740/023	Method Statement for the Installation of Single, 'H' or 'A' Poles using a Vehicle Mounted Crane.
WI 74-02	Work instruction for erecting a single pole using a 1000 kg 'A' frame derrick and winch.
WI 74-03	Work instruction for erecting a single pole using 'pole pikes'
WI 74-07	Work Instruction for erecting 'H' poles using a 1000kg 'A' frame derrick and winch.
WI 74-08	Work Instruction for erecting 'H' poles using a 3000kg 'A' frame derrick and winch.
WS 04/010	Work specification – Erection of single pole using a falling derrick 'A' frame
WS 04/011	Work specification – Pole erection – Pike method
WS 04/012	Work specification – Pole erection – Pole raising shear legs (Swedish lifters)
WS 04/013	Work specification – Erection of H pole Falling Derrick 'A' Frame.
WS 04/014	Work specification – Pole erection – Gin pole method
WS 04/018	Work specification - Pole erection using existing pole

4.3. Amendments from Previous Version

Reference	Description
Whole Document	Document reviewed no changes required – Paul McAdoo 03/10/2023 Doc approved by email Paul Black 05/10/2023 Doc republished to grid and externally - LB 17/10/2023

5. Definitions

Term	Definition
SWL	Safe Working Load
WI	Work Instruction

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6. Authority for Issue

6.1. CDS Assurance

I sign to confirm that this document has been assured for issue on to the CDS system

		Date
Liz Beat	Governance Administrator	17/10/2023

6.2. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

Review Period - This document should be reviewed within the following time period.

Standard CDS review of 3 years?	Non Standard Review Period & Reason	
Yes	Period: n/a	Reason: n/a
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
Steve Salkeld	Policy and Standards Engineer	04/03/2014

6.3. Technical Assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

		Date
Ged Hammel	Senior Policy and Standards Engineer	04/03/2014

6.4. Authorisation

Authorisation is granted for publication of this document

		Date
Paul Black	Head of System Engineering	05/10/2023