

Wooden Pole & Conductor Condition Assessment

Designers Forum

EEA.CO.NZ



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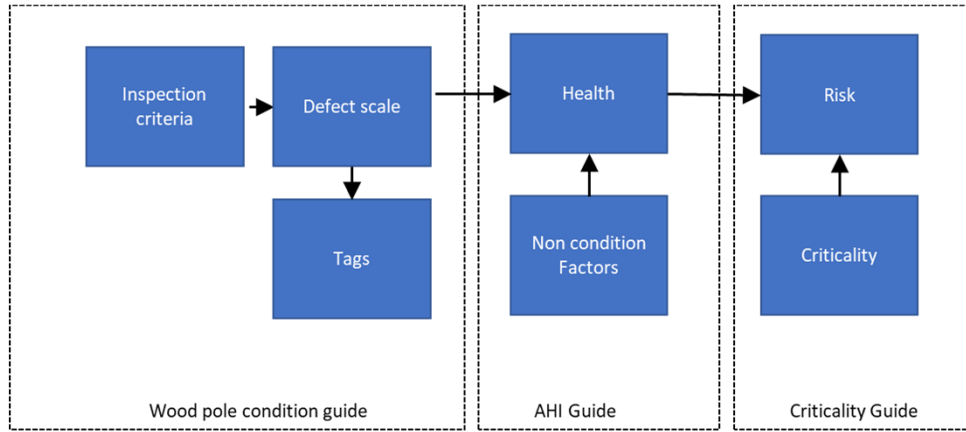
Wood Pole Condition Guide Objectives

Improve the accuracy and efficiency of wood pole condition assessment and increase consistency within the utility industry.



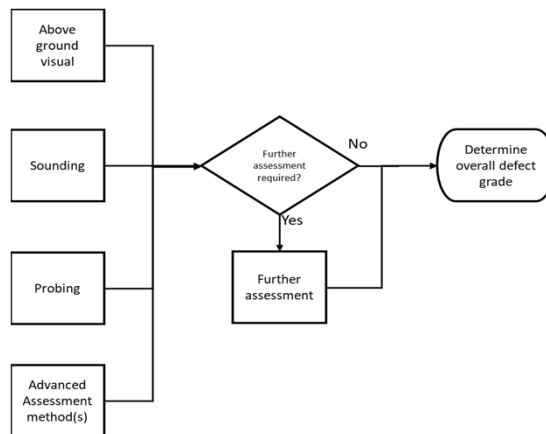
2

How the guide fits in



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Condition assessments aggregate data from multiple sources






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Guidelines for visual assessments

• Appendix A → Visual assessment images¶

Failure Mode: Ground-Line Decay¶

		
DX ^α Pocket-rot at ground-line ^α	DX ^α Ground-line rot... Confirm extent by probing and measurement ^α	DX ^α Ground-line decay... Confirm by probing and measurement ^α



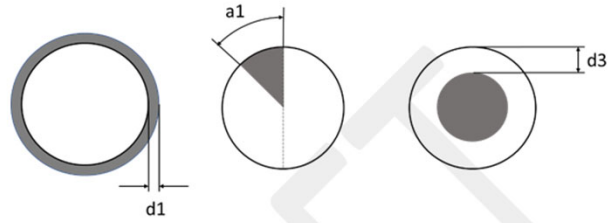
Guidelines for sounding assessments

Table 8: Comparative Sound characteristics for hammer tests.

Scenario	Frequency (pitch)	Decay time	'qualitative sound'	Hammer rebound
Solid	Higher	Longer	Crisp ring	firmer
Internal decay	Lower	Shorter	Dull or dead	softer
Hollow void	Lower	Longer	Hollow	softer



Guidelines for probing/below ground assessments



Pole Size	d1 average (mm)	a1 (mm)	d3 (mm)	Defect grade
150 – 199mm	15	157	30	D1
200 – 249mm	20	196	50	D1
250 or greater	30	235	50	D1



Advanced Assessments

- Usually proprietary, applying technology and data processing.
- The guide does not pick winners, but rather discusses selection criteria and how an advanced assessment should be incorporated into an overall program.



Defect Level	Criteria	Indicative intervention time	Indicative Inspection/maintenance requirement	Condition input to AH1
D5	Protective systems are fully functional. No loss of capacity. No loss of functionality. No flaws.	25+	Normal Inspection	H5
D4	Protective systems showing signs of depletion. No loss of capacity. No loss of functionality. Initial indicators of flaws that might in time develop in significance.	10-25	Increased Inspection	H4
D3	Protective systems functionally depleted. Initial stages of deterioration evident, minor loss of capacity. Developing flaws that could result in end of life. No loss of functionality.	5-10 years	Increased Inspection, consider opportunistic replacement with other works.	H3
D2	Significant deterioration and loss of capacity not exceeding design allowance for ultimate loads. Non-critical loss of functionality. Presence of significant flaws not exceeding acceptable threshold	5 years	Schedule for planned intervention, increased inspection.	H2
D1	Loss of capacity exceeds design allowance for ultimate loads. Loss of critical functionality. Flaws exceeding acceptable threshold.	1 year (as per regulation)	Planned Intervention, increased inspection, implement access restrictions.	H1
D0	Loss of capacity exceeds design allowance for normal loads. Critical loss of functionality presenting an immediate safety hazard. Flaws exceeding hazard threshold.	3 months maximum.	Priority Intervention, implement access restrictions.	H1

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Proposed standardised meaning for tags

Table 11: Meaning of pole tag colours

Tag Colour	Meaning	Criteria
Red	Extreme Caution – do not climb	A structure, including pole top assembly's and setting that has been assessed to be at risk of failing under normal loads and must not be climbed.
Orange/Yellow	Caution – do not climb	A structure, including pole top assembly's and setting that has been assessed as incapable of meeting design loads and must not be climbed.
Blue	Caution – do not climb	A structure the asset owner considers as unsuitable for climbing for any reason other than those defined by Red or Orange/Yellow tags.



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Project Schedule

- Targeted draft to be completed by April 1.
- Currently 80% done
- Working through remaining issues to gain a consensus document.
- Issue consultation draft – end May



Conductor Condition Assessment

Purpose of the Guide

1. Provide industry guidance for the assessment of overhead conductor health for evaluating serviceability and forecasting end of life.
2. Provide a visual assessment framework for conductor types commonly used in New Zealand to creating commonality in grading (for both engineering and disclosure purposes) and for exploring future correlations between visual assessment, remnant strength and serviceability.
3. Provide a common data collection framework to assist with information sharing between interested NZ EDB's and a possible common database.
4. To provide guidance on the development of a network wide conductor condition model utilising the UK DNO Common Methodology as a modelling method.



Project history

- Started in 2020
- Small team worked during lockdown remotely to develop concepts and outline.
- Project stalled due to work commitments late 2020.
- Was parked pending development of wood pole guide so that the conductor guide will be consistent.
- Ready to start again now.






Conductor Grading Scale

Conductor Health Indicator	Definition
H1	Significant deterioration is present which compromises the Serviceability and safety. Approximate reduction in strength >20%
H2	Material deterioration is present which is expected to reduce the strength and serviceability. Approximate reduction in strength in the range of 11-20%
H3	Deterioration is present which marginally reduces strength or serviceability. Approximate reduction in strength in the range of 6 - 10%
H4	Normal in-service deterioration affecting appearance. None to minor reduction in strength or serviceability of 0 - 5 %
H5	As new condition, no observable deterioration or reduction in strength or serviceability.



Conductor Grading Scale

Health Grade	Image	Observations
H1		Discolouration of conductor heavy flaking on outer layers type corrosion and / or extensive heavy pitting on multiple strands and / or multiple broken strands.
H2		Discolouration of conductor some small flaking on outer layers type corrosion and / or minor light pitting on some strands and / or one localised broken strand
H3		Discolouration of conductor, light dust on outer layers type corrosion, minor material loss



Other Content

- Discussion of other condition assessment tools
- Standard specification for laboratory tests
- Guide to photographing conductors
- Common data collection template
- Guidance to constructing a CNAIM conductor model.



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Next Steps

- Ready to restart
- If you are interested in being a part of the development let us know.

