

Conductor & Pole Condition Guide

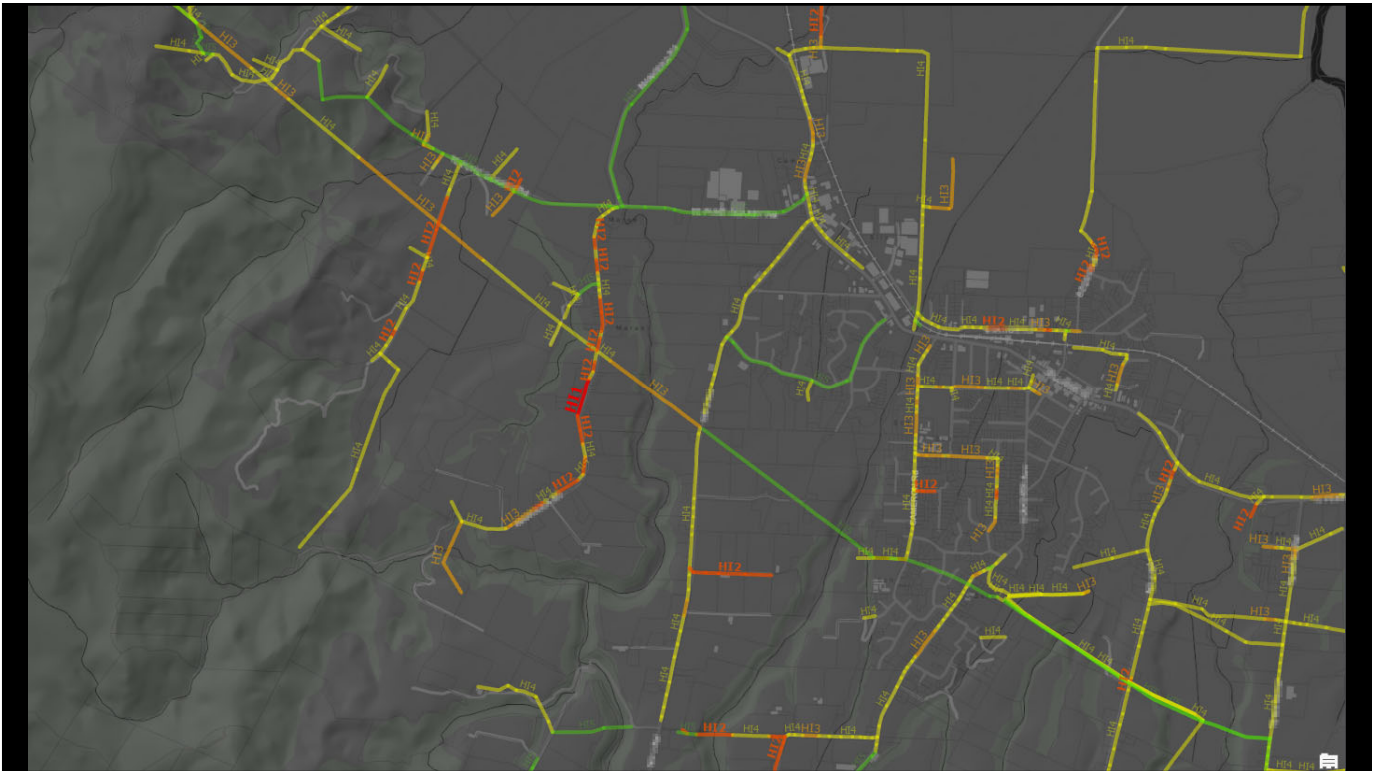
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Guide Contents

- Standardised grading scales for condition assessment
- Qualitative criteria for assessing deterioration.
- Visual guide to assist with visual grading.
- Some background material on degradation mechanisms and test methods for context.
- Target audience – asset management practitioner



Grading Scale Conductors

CONDITION / DAMAGE LEVEL ²	CRITERIA	INDICATIVE REDUCTION IN TENSILE STRENGTH
D5	As new condition, no observable deterioration or reduction in strength.	Nil
D4	Protective systems such as galvanising or greasing showing initial signs of depletion or reduced effectiveness with no observed loss of strength. OR changes in appearance suggesting the presence of ageing mechanisms with no observed loss of strength.	Nil
D3	Protective systems functionally depleted. Initial stages of deterioration evident, minor loss of strength.	0-10%
D2	Significant deterioration or damage and moderate loss of strength.	11-20%
D1	Major deterioration or damage causing substantial loss of strength with potential for failure under contingency conditions.	>20% OR potential for failure under design loading conditions.
D0	Critical loss of strength presenting an immediate safety hazard.	Potential for failure under normal loading conditions.

Table: 3 EEA Condition and Damage Classification Scale (conductors)

Grading Scale Conductors

CONDITION / DAMAGE LEVEL ²	CRITERIA	INDICATIVE REDUCTION IN TENSILE STRENGTH	AHI Mapping
D5	As new condition, no observable deterioration or reduction in strength.	Nil	H5
D4	Protective systems such as galvanising or greasing showing initial signs of depletion or reduced effectiveness with no observed loss of strength. OR changes in appearance suggesting the presence of ageing mechanisms with no observed loss of strength.	Nil	H4
D3	Protective systems functionally depleted. Initial stages of deterioration evident, minor loss of strength.	0-10%	H3
D2	Significant deterioration or damage and moderate loss of strength.	11-20%	H2
D1	Major deterioration or damage causing substantial loss of strength with potential for failure under contingency conditions.	>20% OR potential for failure under design loading conditions.	H1
D0	Critical loss of strength presenting an immediate safety hazard.	Potential for failure under normal loading conditions.	

Table: 3 EEA Condition and Damage Classification Scale (conductors)

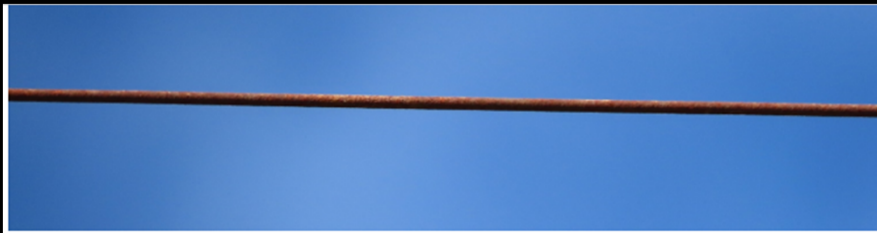
Qualitative Assessment Criteria

ASSESSMENT	D5	D4	D3	D2	D1
VISUAL ASSESSMENT CONDITION	Shiny as new condition or dulling of surface	Developed patina with no evidence of flaking or pitting.	Discolouration of conductor, light pitting and or flaking on outer layers.	Developed patina flaking on outer layers sufficient to reduce section and / or observable pitting on some strands and / or one localised broken strand.	Discolouration of conductor heavy flaking on outer layers and / or extensive heavy pitting on multiple strands and / or multiple broken strands.
VISUAL ASSESSMENT DAMAGE	No damage	No damage	Damage causing noticeable reduction in cross sectional area to one or more strands, no broken strands.	Damage causing breakage of a single strand.	Damage causing breakage of multiple strands.
WRAP TEST	Pass	Pass	Minor cracks observed during wraps no breakage	Fail	Fail
TENSILE TEST % REDUCTION	0%	0%	0-10%	11-20%	>20%
OPERATIONAL PERFORMANCE	No in service failures	No in service failures	One or more preventative repairs made due to deterioration.	One unassisted conductor failure due to deterioration. Multiple preventative repairs made due to deterioration	Multiple representative instances of unassisted conductor failure within the conductor section due to deterioration

Qualitative inspection criteria copper conductors



Type: Copper
Size: 7/064
Failure mode: Corrosion – Flaking Patina
Grade D3
Assessment Notes
 Conductor showing patina with flaking potentially reducing the conductor cross section.



Type: Steel
Size: No.8
Failure mode: Corrosion
Grade D3
Assessment Notes
 Steel conductor showing near complete loss of protective coating and limited evidence of surface pitting.

Timber Pole Guide



Decay: Sapwood
Grade: D3
Assessment Notes
 Apparent decay in the pole head coupled with sapwood delamination. The sapwood delamination does not appear to seriously compromise the connection of the cross-arm king bolt; however, the arm brace coach screw might be compromised. Suggest pole top photograph to confirm extent of any pole top decay if possible and replacement of the coach screw with a bolt.

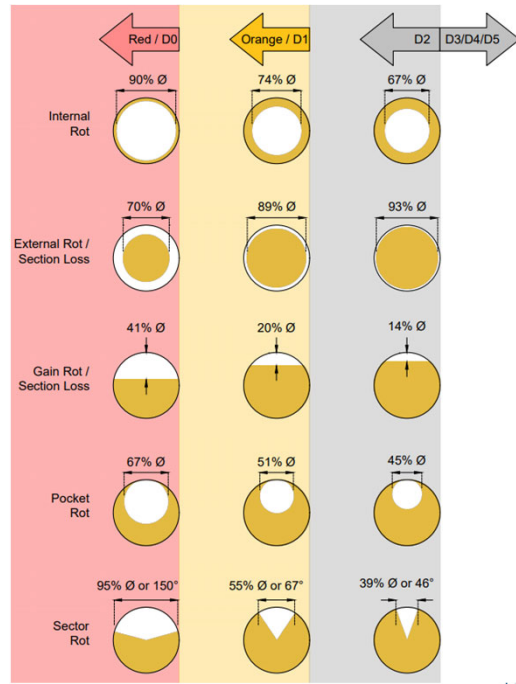
Condition Level	Criteria	Indicative Intervention Time	Indicative Inspection Requirement	Condition Input to A&E
D5	Protective systems are fully functional. No loss of capacity. No loss of functionality. No flaws.	25+ years	Normal inspection requirement.	H5
D4	Protective systems showing signs of depletion. No loss of capacity. No loss of functionality. Initial indicators of flaws that might in time develop in significance.	10-25 years	Increased inspection requirement.	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 requirement. Consider opportunistic replacement with other works.	H3
D2	Significant deterioration and loss of capacity not exceeding design allowance for structural design loads. Non-critical loss of functionality. Presence of significant flaws not exceeding acceptable threshold.	5 years	Increased inspection requirement. Schedule for planned intervention.	H2
D1	Loss of capacity exceeds or is suspected to exceed design allowance for structural design loads. Critical loss of functionality. Flaws exceeding acceptable threshold.	1 year (as per regulation)	Increased inspection requirement. Planned intervention. Implement access restrictions. Apply Orange-yellow tag.	H1
D0	Loss of capacity such that the pole is at risk of failing under normal loads. Critical loss of functionality presenting an immediate safety hazard. Flaws exceeding hazard threshold.	3 months maximum (as per regulation)	Priority Intervention. Implement access restrictions. Apply red tag.	H1

Interpreting Reference Images

Visual grading question: Based on your experience and judgement is the observation at hand more likely, less likely, or about as likely to fail than the condition shown in the reference image? If more likely select a lower health grade, if less likely select a higher health grade.



Groundline Decay Criteria



Pole guide - Normal vs Design Loads

Design loads	Loads calculated in accordance with AS/NZS7000:2016 for a design working life of 5 years. Selection of the 5-year working was selected because assets with D2 ratings should typically be remedied within 5 years of being identified, and all D1 rated poles are required to be rectified within one year.
Normal loads	Loads associated with the construction and maintenance load case defined in AS/NZS7000:2016. This includes an applied wind loading of 100Pa and loads associated with ladder climbing loads.

Beaufort number	Wind Barb	Wind speed knots	Wind speed km/hr	Observation	Name
6		25-31	39 - 49	Large branches in motion, whistling heard in wires	Strong Breeze



In Conclusion

- Conductor guide will be released soon – we hope that you find it useful.
- Wood pole has been out for about 1 year now.
- Please let the EEA know if you have suggestions for improvements.
- Thanks to everyone involved in the preparation of both guides.

