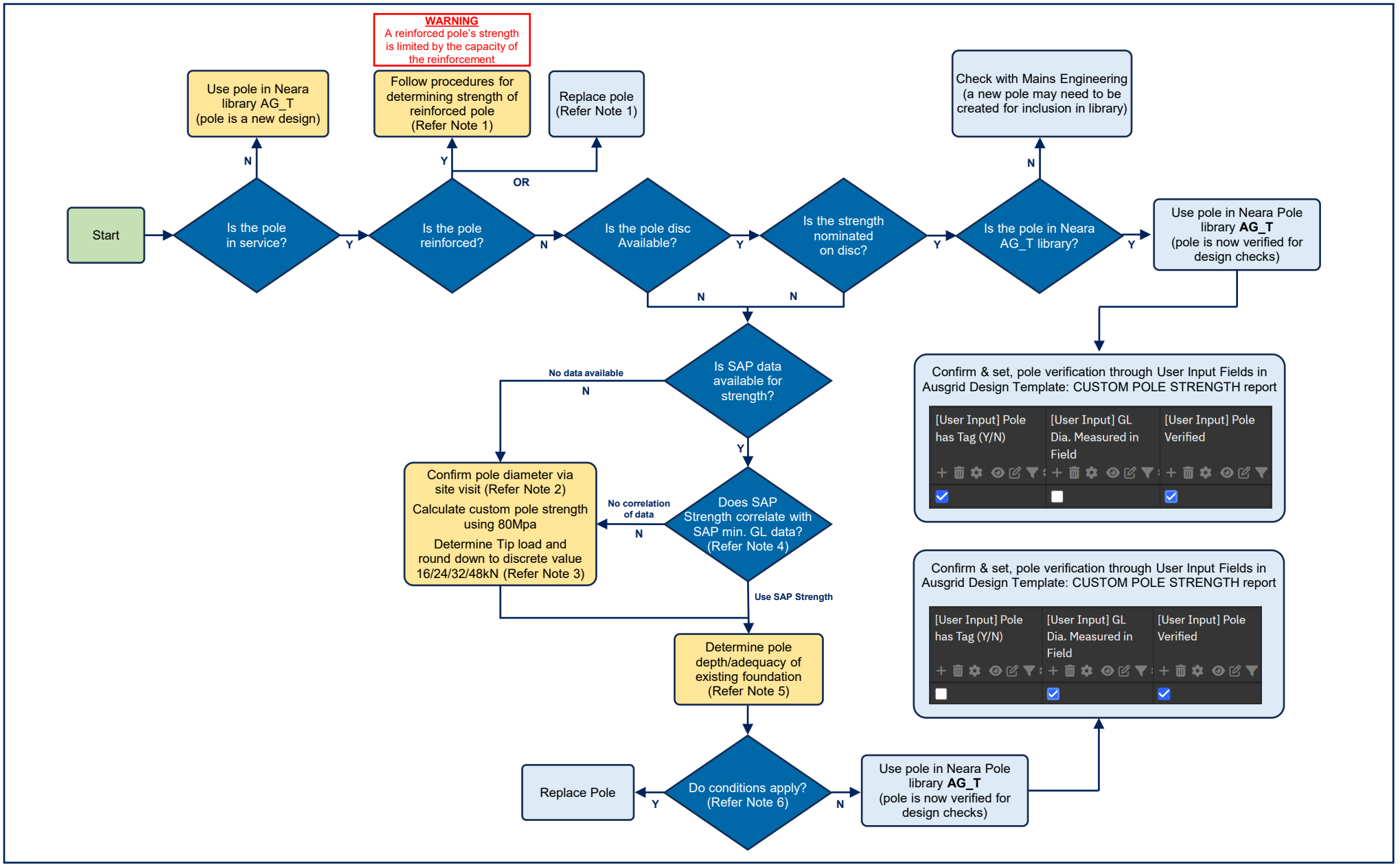
WARNING
A reinforced pole's strength is limited by the capacity of the reinforcement
Start
Is the pole in service?
N
Use pole in Neara library AG_T (pole is a new design)
Y
Is the pole reinforced?
Y
Follow procedures for determining strength of reinforced pole (Refer Note 1)
OR
Replace pole (Refer Note 1)
N
Is the pole disc Available?
Y
Is the strength nominated on disc?
Y
Is the pole in Neara AG_T library?
N
Check with Mains Engineering (a new pole may need to be created for inclusion in library)
Y
Use pole in Neara Pole library AG_T (pole is now verified for design checks)
N
N
Is SAP data available for strength?
No data available
N
Y
Confirm pole diameter via site visit (Refer Note 2)
Calculate custom pole strength using 80Mpa
Determine Tip load and round down to discrete value 16/24/32/48kN (Refer Note 3)
No correlation of data
N
Does SAP Strength correlate with SAP min. GL data? (Refer Note 4)
Use SAP Strength
Determine pole depth/adequacy of existing foundation (Refer Note 5)
Do conditions apply? (Refer Note 6)
Y
Replace Pole
N
Use pole in Neara Pole library AG_T (pole is now verified for design checks)
Confirm & set, pole verification through User Input Fields in Ausgrid Design Template: CUSTOM POLE STRENGTH report
[User Input] Pole has Tag (Y/N)
[User Input] GL Dia. Measured in Field
[User Input] Pole Verified
Confirm & set, pole verification through User Input Fields in Ausgrid Design Template: CUSTOM POLE STRENGTH report
[User Input] Pole has Tag (Y/N)
[User Input] GL Dia. Measured in Field
[User Input] Pole Verified

Note1: Reinforced Poles

Although not mandated, in many instances it would be prudent to replace a reinforced pole.

- The pole is to be replaced if the pole is a reinforced 11kV UGOH.
- Consider the overall cost of the project to determine if it is opportunistic to replace during the works. Whenever work is planned that will affect a reinforced timber pole, the nature and cost of the work should be analysed to determine if it is an opportune time to replace the reinforced pole. The additional cost of replacing the pole at the time of carrying out the work should be balanced against the cost of replacing the pole after the work is completed. As a guideline, where the cost of the timber pole, plus the cost of standing and falling the pole, is half or less than half of the total cost of the job that includes pole replacement, the pole should then be replaced at the same time as the planned work.

Instructions to determine the existing strength of the pole/reinforcement system should be followed where load is being modified on these installations (Refer to NS146 & HPRM D25/18294). NOTE: its common to find the reinforcement bending moment capacity < the required design bending moment. Where this is encountered, the pole is to be replaced.

Note 2: Site Visit

As part of Safety in Design early identification of hazards, the following inspection process is not conclusive as to the overall condition assessment of a power pole. It is purely a way of determining if the risk already taken from having no information about the pole is increased through these additional observations. As the risk increases, a pole replacement should be considered. In particular if you are planning on significantly changing loads on the pole.
The existing pole inspection process (NS145) determines the residual strength and the overall serviceability of the pole. Refer to this document when determining the point of girth measurement.

During visit, confirm the following:

- Pole is in good condition, including pole head condition.
- No signs of termite past or present
- No reduction in strength identified through inspection data (internal defects have been previously noted)
- No pole lean (foundation adequacy / undetected groundline defect)

Note 3: Tip Load Determination

Where poles are calculated as having their custom pole strength (CPS) < 16kN ultimate, the CPS should be used for the tip capacity of the pole. Do not round pole up/down. A new pole is to be created in the Wood Pole Library and assigned the custom pole strength (Breaking Tip Load (kN)).

When rounding down to a 16kN pole, select the 'Non-AML -- AG_ T_ xx.xm_xxkN_Ult. (xkN)' pole from the pole library. These poles are labelled differently to identify these poles as non-Ausgrid Material Listed poles. These poles are not to be used for new designs but can be modelled as part of the existing network.

If additional information is known regarding the pole species, the corresponding strength (S1/S2) can be used within the CPS calculation (refer to NS145).

Where poles CPS is > 90% of the higher nominated discrete pole size and the existing pole loads are > then the lower discrete pole strength, it can be assumed that this diameter could have been due to degradation. In this case the higher pole strength can be utilised.

Eg. the pole has no data available, and measured CPS = 22kN ultimate (80MPa)
CPS = 22 > 90% x 24kN = 21.6kN is TRUE
Existing Design Load = 18kN, which is above 16kN (discrete value)
OK to round pole up.

Note 4: Correlating Data

A correlation between the SAP strength and the SAP minimum groundline diameter means the pole strength calculated from using the CPS equation, including the minimum ground line diameter and the corresponding timber species fiber strength, results in a pole strength that is above the recorded SAP name plate strength.

eg. SAP indicated pole is a 12.5m/8kN, however no species data is available.
SAP last measured minimum Groundline diameter is 300mm
No SAP Species data so assume S2 = 80MPa
CPS = 19.9kN (which is < 32kN name plate)
at this point the SAP data has not correlated. Confirm information with Site visit and measurement.

eg. SAP indicated pole is a 12.5m however no strength is recorded.
SAP last measured minimum Groundline diameter is 300mm
SAP Species is Black Butt = S2 = 80MPa
CPS = 19.9kN (which is < 24kN name plate)
Confirm information with Site visit and measurement and round pole capacity down to 16kN.

Note 5: Embedment Depth of Existing Power Poles

Determining the embedment depth of existing poles is often difficult to validate. Poles may have been modified so it is hard to reliably correlate the height above ground to the name plate length, to determine the below ground length. However, this should not stop you from trying to work it out, in an effort to build confidence in your decision making for this asset and reduce the risk to a level that is ALARP. Additionally, it is a good idea to build confidence in the existing performance of the foundation to enable this pole to be included in your augmented design without the need for replacement.

Tips for determining the embedment depth of existing poles

- For poles prior to 1974 that have a disc that indicates the length (these are typically imperial size poles - eg 45'), we can measure the height of the pole out of ground and subtract this from the length indicated on the disc to determine the sinking depth.
- For poles that have a disc that can be correlated against the examples in Annexure A of NS145, then the height of the disc from ground level can be measured to determine the sinking depth.
- For Mackellar poles that have a T notch visible, then the height of the notch can also be measured and used to determine the sinking depth.
- If there is evidence to suggest that the existing pole footing strength is compromised, then it would be prudent to consider this pole for replacement, in particular if you are planning on increasing the design loads and more importantly, if the design loads are acting permanently on the pole. Refer to conditions Note 6 on this document.

Where possible, you have evaluated with high confidence the poles embedment is compliant with PEC, a pole replacement is not required. Where limited information is available regarding the embedment depth of the existing pole the following conditions must be accessed to determine if a pole replacement is the preferred solution.

Note 6: As it is difficult to confirm a poles existing foundation depth, a pole replacement is required when any of the following conditions (but not limited to) are encountered:

a. from site or survey information, the pole has rotated within the ground and is leaning unusually; Pole rake (away from load) **not** to be considered in this decision;
b. Significant sustained loads have been introduced or increased from an existing situation: such as large deviation angles, terminations, tee-offs, stay poles or where construction loads should be considered for strategic stringing locations (stays can be used to reduce the sustained loads);
c. Eccentric Loads: where an 20% increase in design load has occurred on poles where eccentric loads are present eg. Transformers, regulators and reclosers;
d. Where load increases exist on designs that fall part of significant infrastructure eg. water crossings, railways, RMS roads, Easements/encroachments/buildings and unattached crossings or highly populated/frequented areas or where aesthetic / visually sensitive considerations are required.