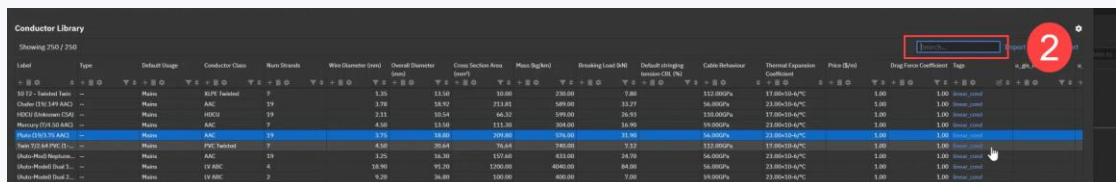


This QRG will show Neara users how to string new conductors and make an allowance for conductor creep. Designers need to allow for conductor creep when lineworkers will install new conductors and tension them on the day of installation. *Note: Conductor Breaking Load (CBL) and Ultimate Tensile Strength (UTS) are identical.*

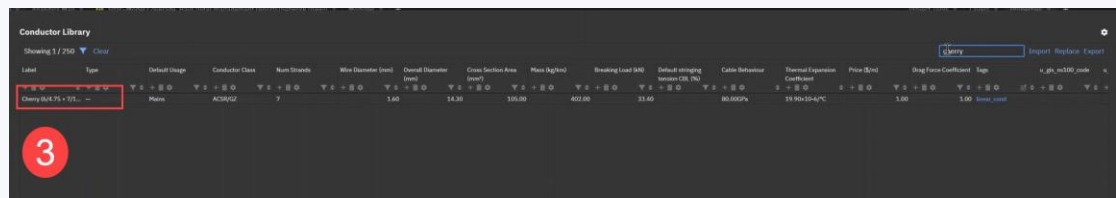
1. To string new conductors, select **Conductor (C)** in the **Toolbox**. Before spotting poles, select the conductor **Type** in the **Properties** panel to open the Conductor Library.



2. Select the Conductor from the list or use the **Search box** to type in part of the Conductor name



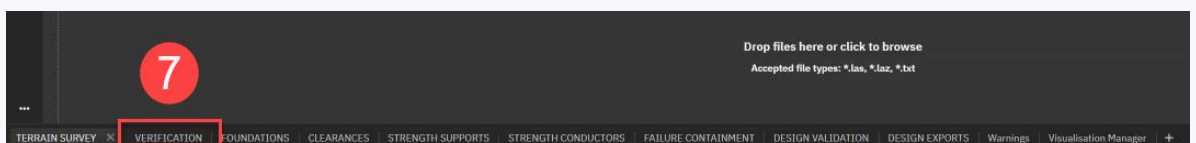
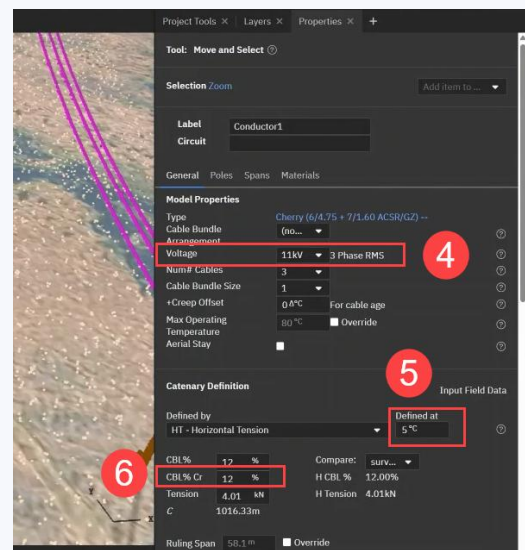
3. In this example, 'cherry' is typed into the Search box. Click on the conductor.



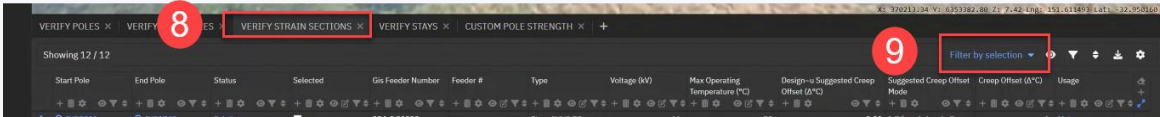
To **spot** poles, left-click the desired locations for the new poles, and Neara will automatically string the conductor.

To edit the conductor, press **Esc** twice on the keyboard, then left-click on the span. In the **Properties** panel:

4. Set the voltage.
5. In **Catenary Definition** set the **Define at** temperature. It is critical that for a new conductor, that this field is set to 5°C, as this is Ausgrid's reference temperature for stringing tensions.
6. Update the final tension value **CBL % Cr** to the required design tension.
7. Select the **VERIFICATION** workspace

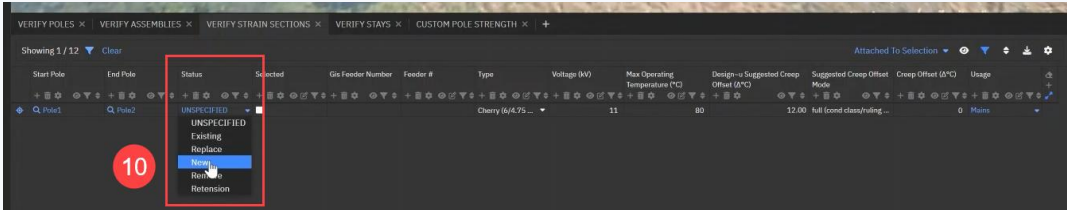


8. Select the **VERIFY STRAIN SECTIONS** tab in the **VERIFICATION** Workspace.
9. If there is no filter applied, click on **Filter by selection** and select **Attached to Selection**.

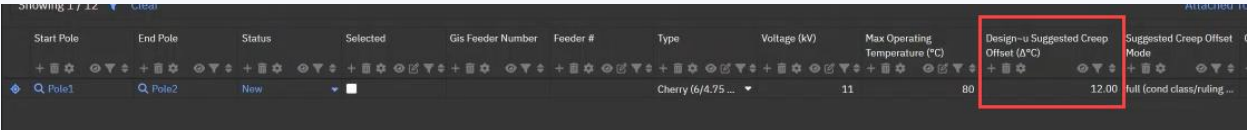


This will filter the results to show only the span selected in the Perspective view

10. Update the status of the span to **New**



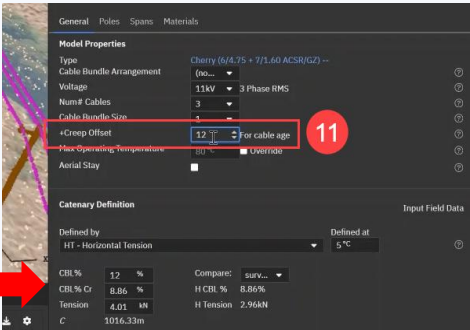
Moving along the columns, the **Suggested Creep Offset temperature** is 12.00°C.



11. Enter the **Suggested Creep Offset temperature** (from Step 10) into the **+ Creep Offset** field in the **Properties** panel.

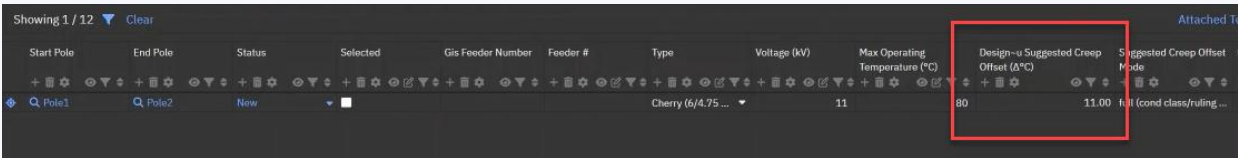
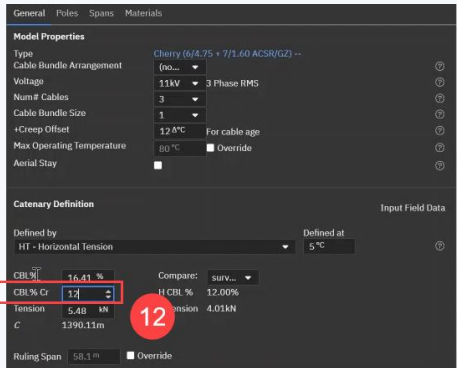
**Note:** When a **+Creep Offset** value is entered, Neara automatically adjusts the **CBL % Cr** value to account for the creep offset.

In this example, Neara maintains 12% in the Initial **CBL%** field, but adjusts the **CBL % Cr** down to 8.86%. However, designers need to change the **CBL % Cr** value back to 12% as this is the Final tension that is required.



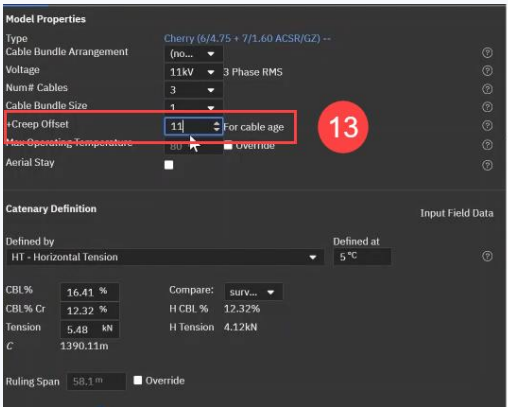
12. When **CBL % Cr** is changed back to 12%, the **CBL %** field increases. This aligns with the principle of **initial tension**, which is the over-tensioning that lineworkers apply to account for creep. Over successive months and years, the initial 16.41% will 'creep' to 12% @ 5 °C.

Checking back in the **VERIFY STRAIN SECTIONS** tab, the **Suggested Creep Offset temperature** has now changed to 11°C. This is due to **Data Table** rules that Ausgrid has set up in Neara (see bottom of Page 3).

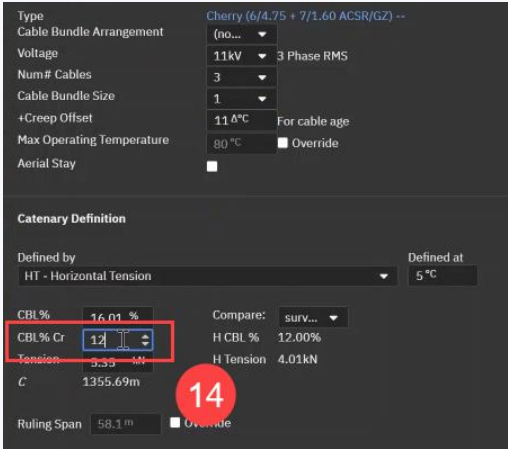


13. Repeat the previous process of updating the **+Creep Offset** in the Properties panel; in this instance, enter the value as 11(°C).

Note again, that the **CBL % Cr** value changes



14. Re-enter the **CBL % Cr** (Final tension) as 12%



Checking the **VERIFY STRAIN SECTIONS** tab, we note that the **Suggested Creep Offset temperature** has settled at 11°C. If it had changed again, we would need to repeat the process above.

Start Pole	End Pole	Status	Selected	Gis Feeder Number	Feeder #	Type	Voltage (kV)	Max Operating Temperature (°C)	Design--u Suggested Creep Offset (Δ°C)	Suggested Creep Offset Mode
Pole1	Pole2	New				Cherry (6/4.75 ...	11	80	11.00	full (cond class/ruling ...

NOTE: The **Suggested Creep Offset temperature** is generated from a **Data Table** in Nera that assesses the conductor type, stringing tension and ruling span length to determine the required offset temperature.

design-creep offset temperature				
row	conductor_class	stringing tension	ruling span	creep offset temp
87	HV ABL	9.000%	100.00m	10.000°C
88	HV ABC	10.00%	50.00m	13.000°C
89	HV ABC	10.00%	75.00m	13.000°C
90	HV ABC	10.00%	100.00m	13.000°C
91	ACSR	12.00%	50.00m	13.000°C
92	ACSR	12.00%	75.00m	12.000°C
93	ACSR	12.00%	100.00m	12.000°C
94	ACSR	12.00%	150.00m	21.000°C
95	ACSR	22.50%	100.00m	13.000°C
96	ACSR	22.50%	150.00m	12.000°C
97	ACSR	22.50%	200.00m	14.000°C
98	ACSR	22.50%	250.00m	21.000°C
99	CSSM62	12.00%	50.00m	1.000°C
100	CSSM62	12.00%	75.00m	2.000°C
101	CSSM62	12.00%	100.00m	3.000°C
102	CSSM62	12.00%	150.00m	4.000°C
103	CSSM62	22.50%	100.00m	5.000°C
104	CSSM62	22.50%	150.00m	8.000°C
105	CSSM62	22.50%	200.00m	13.000°C
106	CSSM62	22.50%	250.00m	19.000°C
107	SGGZ	12.00%	50.00m	3.000°C
108	SGGZ	12.00%	75.00m	5.000°C

Once the **Creep Offset** and **Stringing Tensions** are set, a **Stringing Chart** for the **Initial** conductor condition can be exported. An **Initial Stringing Chart** is required for lineworkers who will install conductors and tension them on the day of installation.

Before exporting the stringing chart, scroll through the **Properties** panel and review the **Tension in Environments** table. Check that all tensions are below the Environment maximums (**EnvMax**).

15. Left-click on **Export Stringing Table CSV**. Save this file to the project folder (or other relevant location) with the word **‘Initial’** in the name.

Open this file in Excel to view the **Initial Stringing Chart**.

Interrogating two key values will confirm that these are indeed the **Initial** values (remember that the goal is for a Final tension of 12% CBL) :

- **Horizontal Tension (% CBL) = 16.01% @ 5°C** (see 1st arrow below)

• **Horizontal Tension = 5.35kN @ 5°C** (see 2nd arrow below)

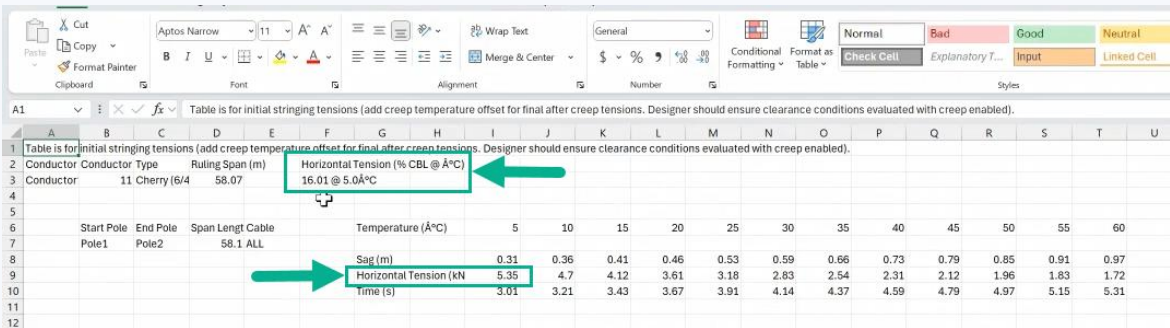


Table is for initial stringing tensions (add creep temperature offset for final after creep tensions. Designer should ensure clearance conditions evaluated with creep enabled).														
Conductor	Conductor Type	Ruling Span (m)	Horizontal Tension (% CBL @ 5°C)											
11	Cherry (6/4	58.07	16.01 @ 5.0A°C											
Start Pole	End Pole	Span Leng	Cable	Temperature (A°C)	5	10	15	20	25	30	35	40	45	50
Pole1	Pole2	58.1	ALL											
				Sag (m)	0.31	0.36	0.41	0.46	0.53	0.59	0.66	0.73	0.79	0.85
				Horizontal Tension (kN)	5.35	4.7	4.12	3.61	3.18	2.83	2.54	2.31	2.12	1.96
				Time (s)	3.01	3.21	3.43	3.67	3.91	4.14	4.37	4.59	4.79	4.97

Comparing these values with those in the **Properties** panel in Neara:

- A. **Initial Stringing Tension (CBL % @ 5°C)** is 16.01%

B. **Horizontal Tension @ 5°C** is 5.35kN

C. The **Compare** tool can be used to show the **Final** conductor tensions at 5°C.

In the **Compare** field, select the **Environment** that relates to 5°C and zero wind (in this case, **Survey** because our **Defined at** temperature is 5°C, although **Sustained – T5** could also be used).

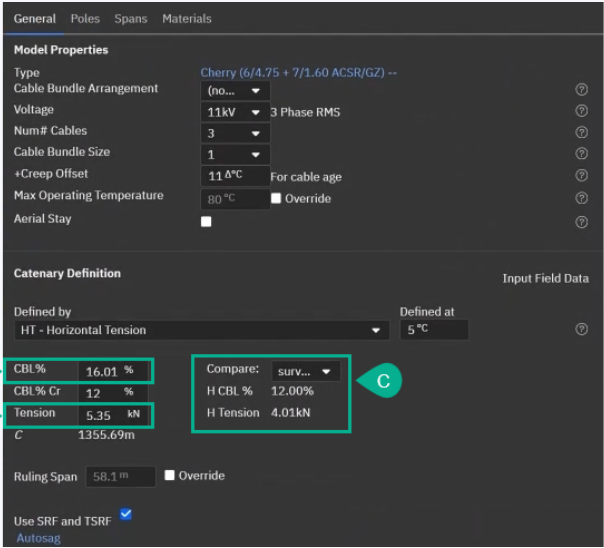
**Final tensions** are shown as:

- **H CBL % = 12.00%**; and

- **Horizontal tension @ 5°C = 4.01kN**

A

B



General

Poles

Spans

Materials

Model Properties

TypeCherry (6/4.75 + 7/1.60 ACSR/GZ) --

Cable Bundle Arrangement(Ino...)

Voltage11kV / 3 Phase RMS

Num# Cables3

Cable Bundle Size1

+Creep Offset11.0°C For cable age

Max Operating Temperature80 °C

Aerial StayOverride

Catenary Definition

Defined byHT - Horizontal Tension

Defined at5 °C

Compare:surv...

H CBL %12.00%

H Tension4.01kN

C1355.69m

Ruling Span58.1m

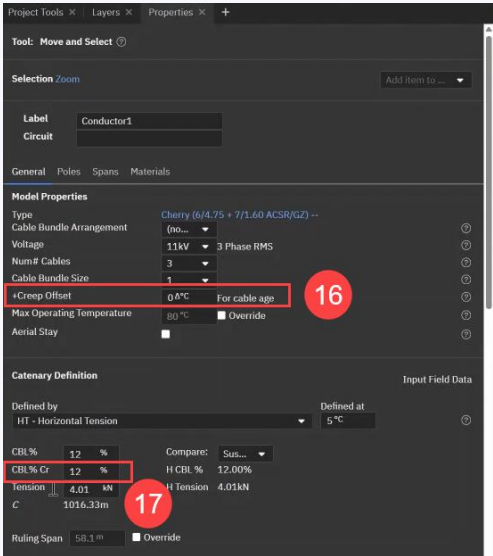
Use SRF and TSRFAutosag



If lineworkers decide to install the conductors and leave them hanging in rollers for more than 24 hours, a **Final Stringing Chart** will be required. lineworkers may do this to manage construction methodology, Network outage constraints, or personal preferences.

To create a **Final Stringing Chart** :

16. Change the **+Creep Offset** in the **Properties** panel to 0 (zero).
17. Change the **CBL% Cr** to the desired value (in this case, 12%).



Scroll through the **Properties** panel and review the **Tension in Environments** table. Check that all tensions are below the Environment maximums (**EnvMax**).

18. Left-click on **Export Stringing Table CSV**. Save this file to the project folder (or other relevant location) with the word **'Final'** in the name.



Open this file in Excel to view the **Final Stringing Chart**.

19. Neara automatically adds **'initial'** into the title of the report. Change this to **'final'**.

pec test (2) - Conductor1 Stringing Table (1).csv

• Saved to this PC

Search

FileHomeInsertDrawPage LayoutFormulasDataReviewViewAutomateDeveloperHelpAcrobat

Cut

Copy

Paste

Font

Alignment

Number

Styles

Aptos Narrow11A<sup>+</sup>A<sup>-</sup>

B

I

U

Text Color

Background Color

Wrap Text

Merge & Center

General

Conditional Formatting

Format as Table

Normal

Bad

Good

Neutral

Check Cell

Explanatory Text

Input

Linked Cell

Table is for final stringing tensions (add creep temperature offset for final after creep tensions. Designer should ensure clearance conditions evaluated with creep enabled).

Conductor	Conductor Type	Rating Span (m)	Horizontal Tension (% CBL @ 5°C) 12.00 @ 5.0A°C												
Start Pole	End Pole	Span Leng Cable	Temperature (A°C)	5	10	15	20	25	30	35	40	45	50	55	60
		58.1 ALL	Sag (m)	0.42	0.48	0.54	0.61	0.67	0.74	0.8	0.87	0.93	0.98	1.04	1.1
			Horizontal Tension (kN)	4.01	3.52	3.1	2.76	2.49	2.26	2.08	1.93	1.81	1.7	1.61	1.53
			Time (s)	3.48	3.71	3.95	4.19	4.42	4.63	4.83	5.01	5.18	5.34	5.49	5.63

Interrogating the two key values in this report will confirm that these are indeed the **Final** values:

- Horizontal Tension (% CBL) = 12.00% @ 5°C** (see 1st arrow)
- Horizontal Tension = 4.01kN @ 5°C** (see 2nd arrow)

Note: the Conductor Breaking Load (CBL) of Cherry is 33.4kN, hence 12% CBL @ 5°C = 4.01kN