OCS - PROFILE TEMPLATE

Catenary System, Fexible Hangers

Calculate the wire profile utilizing the sum of moments methods. Compare the wire positions under alternate design conditions. '''Input system data and uplift force, output is an Elasticity graph'''

The "_system" Python code module handles loading all other required references

In [1]:
```
import _system as OCS
```

------INPUT DATA-------

LAYOUT DESIGN

Data loaded from Sound Transit L800, wire run N51

In [2]:
```
wirerunfilepath = 'InputData_none.csv'
wr = OCS.wire_run(wirerunfilepath)
```

CONDUCTOR PARTICULARS AND LOADING CONDITIONS

Input format is (MW(Weight, Tension), CW(Weight, Tension), HA Weight)

Nominal (installation) conditions. These set the hanger lengths

In [3]:
```
cN = OCS.conductor_particulars((1.544, 5000), (1.063, 3300), 0.2)
```

LC1 Static, Maximum (worst case for wire tensions and overbuilds) - cold, no ice

In [4]:
```
c1 = OCS.conductor_particulars((1.544, 5129), (1.063, 3385), 0.2)
```

*LC2 Static, Minimum (worst case for grade clearances) - hot, no wind

In [5]:
```
c2 = OCS.conductor_particulars((1.544, 4187), (1.063, 2482), 0.2)
```

------SOLVE-------

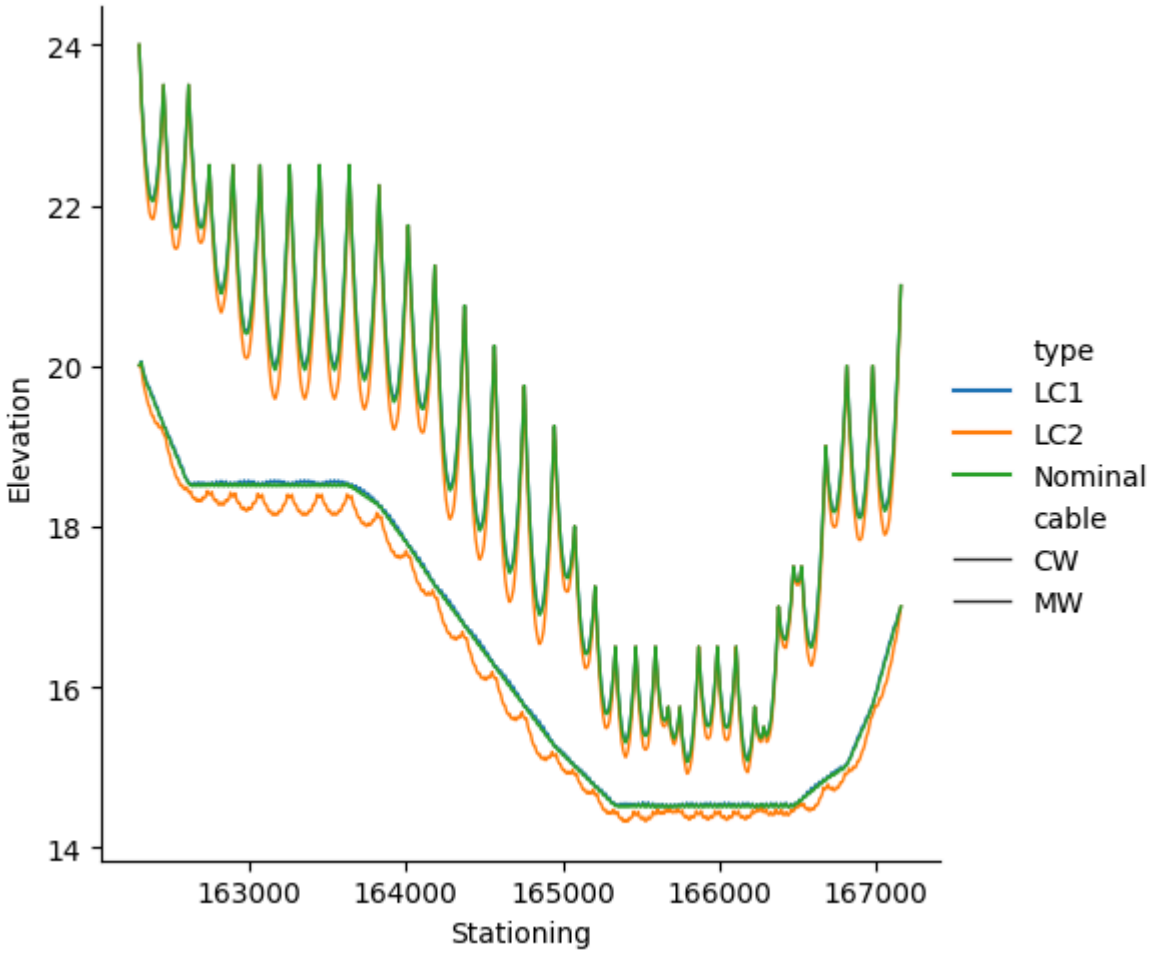
Solve flexible hanger catenary geometry utilizing the "_systems" module. Need to call "_solve" discretely

In [6]:
```
Nominal = OCS.CatenaryFlexible(cN, wr)
Nominal._solve()
LC1 = OCS.AltCondition(c1, Nominal)
LC2 = OCS.AltCondition(c2, Nominal)
```

------OUTPUT-------

Generate sag plots of the wire elevations

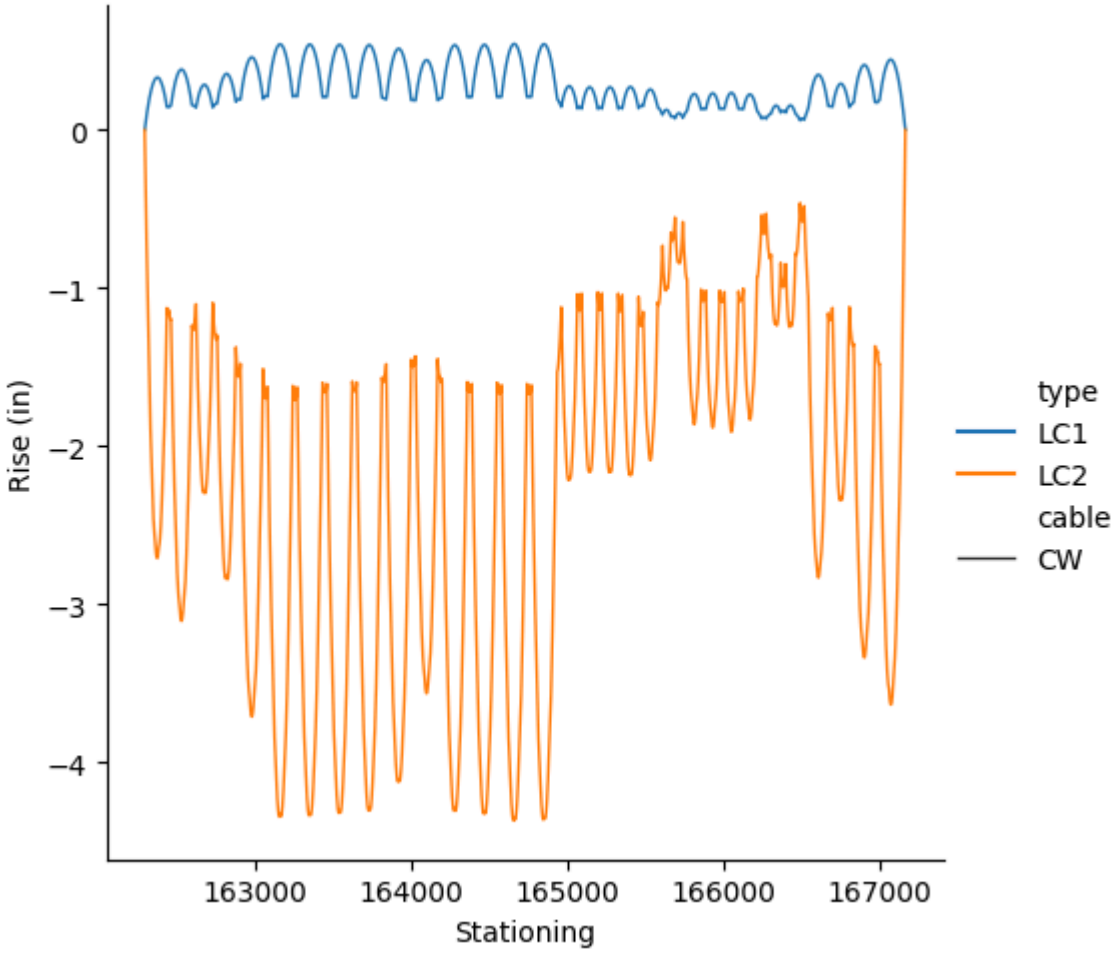
In [7]:
```
pl = OCS.combine_plots(
    ('LC1', 'LC2', 'Nominal'),
    (LC1.dataframe(), LC2.dataframe(), Nominal.dataframe()),
    #row='type'
)
```



Generate plots of the Contact Wire elevation difference at the alternate load cases

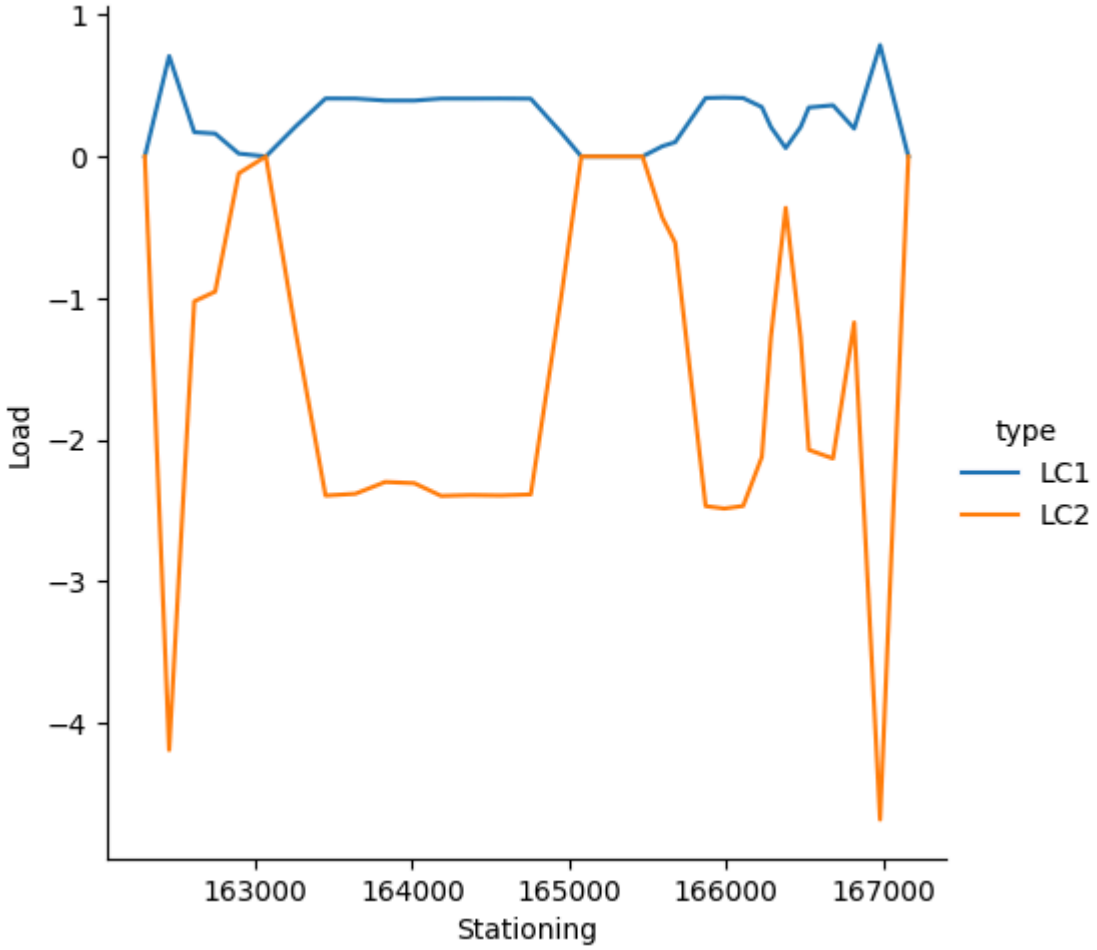
In [8]:
```
pl = OCS.combine_plots(
    ('LC1', 'LC2'),
    (LC1.dataframe_cwdiff(), LC2.dataframe_cwdiff()),
    yscale=12
    #row='type'
)
pl.set_axis_labels(y_var='Rise (in)')
```

Out[8]: <seaborn.axisgrid.FacetGrid at 0x1eff655d090>



Generate plots of the steady arm vertical resistive loading due to changes in the installed heel setting and radial load

In [9]:
```
pl_load = OCS.combine_plots_load(
    ('LC1', 'LC2'),
    (LC1.dataframe_sr(), LC2.dataframe_sr()),
    #row='type'
)
```


1
0
−1
−2
−3
−4
Load
163000
164000
165000
166000
167000
Stationing
type
LC1
LC2