STV

OCS - PROFILE TEMPLATE

Catenary System, Fexible Hangers

Calculate a detailed wire profile utilizing the sum of moments methods. Freely apply point loads or revise wire tensions. Compare the wire positions under alternate design conditions. *Input system data and point loads, output a detailed system graph and loading*

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

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

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

LAYOUT DESIGN

Data loaded from Sound Transit L800, wire run N51

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

CONDUCTOR PARTICULARS

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

Nominal (installation) conditions. These set the hanger lengths

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

POINT LOADS

Lists should be the same length, input zero (0) if loads are applicable to only one of the cables. Positive (+) loads are in the downward direction. Weights applied on the contact wire will be transferred to the messenger wire through the adjacent hangers during solving of the catenary model. Loads entered should be discrete to what is physically applied to the cable. Lists should be the same length and values seperated by commas (,)

```
pN = (
 (list of load descriptions, for reference only)
 (list of station values associated with point loads)
 (list of weights applicable to the contact wire)
 (list of weights applicable to the messenger wire)
 )
```

In [4]:
```
pN = (
('term span', 'uninsulated overlap', 'mpa z-anchor', 'mpa z-anchor', 'SI and feeders',
(162442+30, 162442-15, 164755-25, 164755+25, 166379-15, 166980-15, 167160-30),
(15, 5, -15, -15, 30, 5, 15),
(15, 5, 0, 0, 85, 5, 15)
)
```

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

Solve flexible hanger catenary geometry utilizing the "_systems" module. Need to call "_solve" discretely
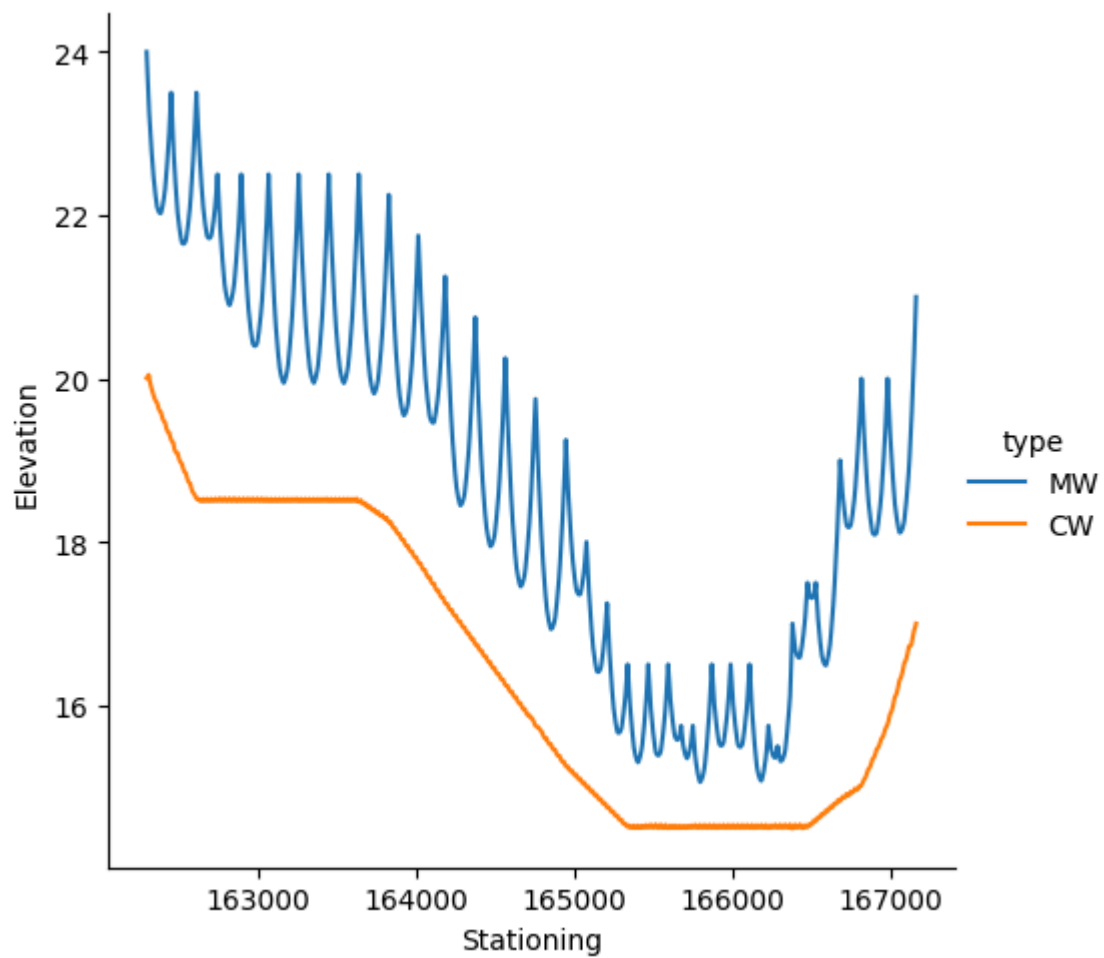
In [5]:
```
Nominal = OCS.CatenaryFlexible(cN, wr)
Nominal.resetloads(pN)
```

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

Generate sag plots of the wire elevations
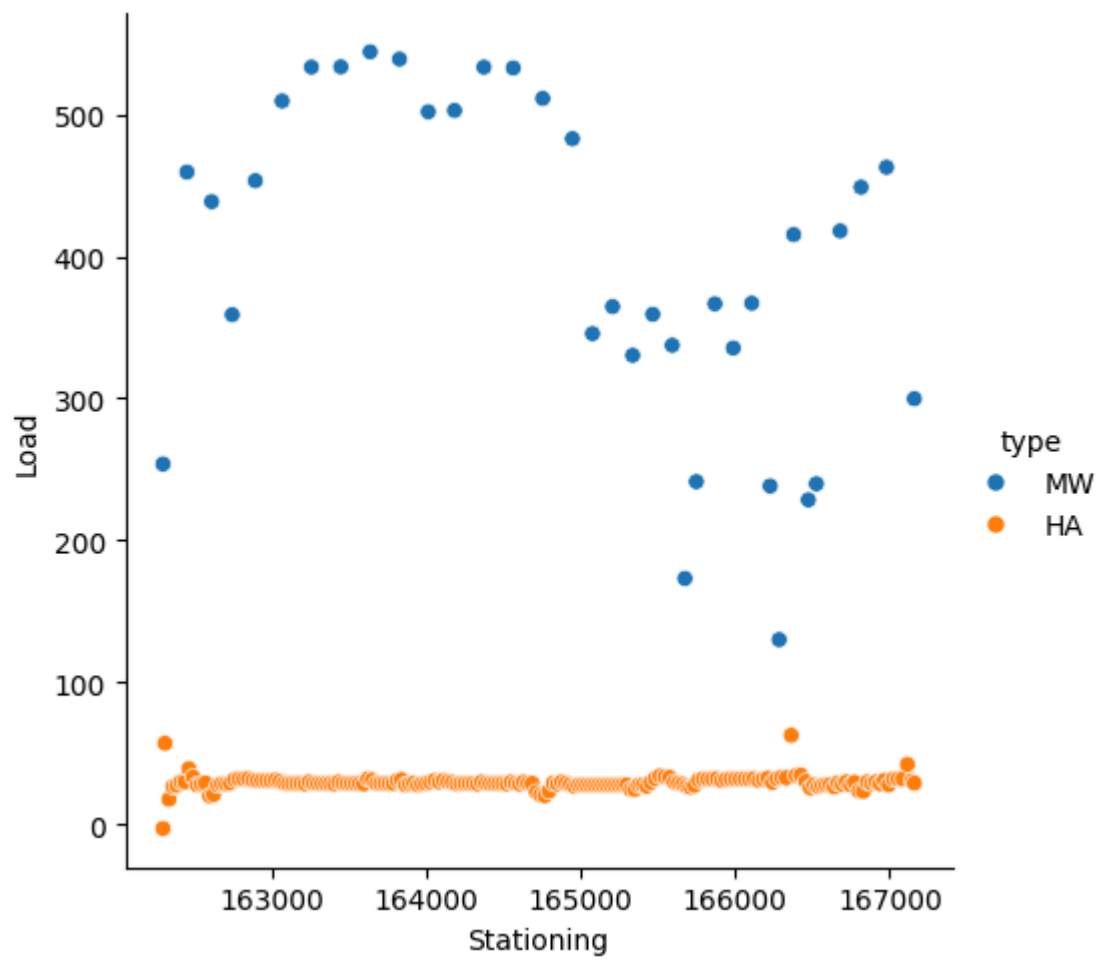
In [6]:
```
Nominal.plot()
```

Out[6]:
```
<seaborn.axisgrid.FacetGrid at 0x123df95a390>
```

Generate plots of the loads at each hanger and at the MW supports

In [7]: `Nominal.plot_spt()`

Out[7]: `<seaborn.axisgrid.FacetGrid at 0x123df870cd0>`

Generate plots of the lengths for each hanger

In [8]: `Nominal.plot_halength()`

Out[8]: `<seaborn.axisgrid.FacetGrid at 0x123e1dc30d0>`