OCS - PROFILE TEMPLATE

Catenary System, Fexible Hangers

Calculate the static change in contact wire height when uplifted by a point load, over a span. 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-------

ELASTICITY CONDITIONS

Positive Uplift force is in the upward direction. (positive weight is normally downwards, but case has changed due to name)

In [2]:
```
UpliftForce = 25
```

Resolution of elasticity graph

In [3]:
```
SpanStepSize = 1
```

Recommend to limit analysis to 1 to 3 spans for simulation time

In [4]:
```
SpanstoAnalyze = 1
StartSPT = 3
```

Recommend at least 3 span buffer for simulation accuracy

In [5]:
```
EndSPT = StartSPT + 3 + SpanstoAnalyze + 3
```

LAYOUT DESIGN

Data loaded from Sound Transit L800, wire run N51

In [6]:
```
wirerunfilepath = 'InputData_none.csv'
wr = OCS.wire_run(wirerunfilepath, StartSPT, EndSPT)
```

CONDUCTOR PARTICULARS AND LOADING CONDITIONS

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

In [7]:
```
cN = OCS.conductor_particulars((1.544, 5000), (1.063, 3300), 0.2)
```

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

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

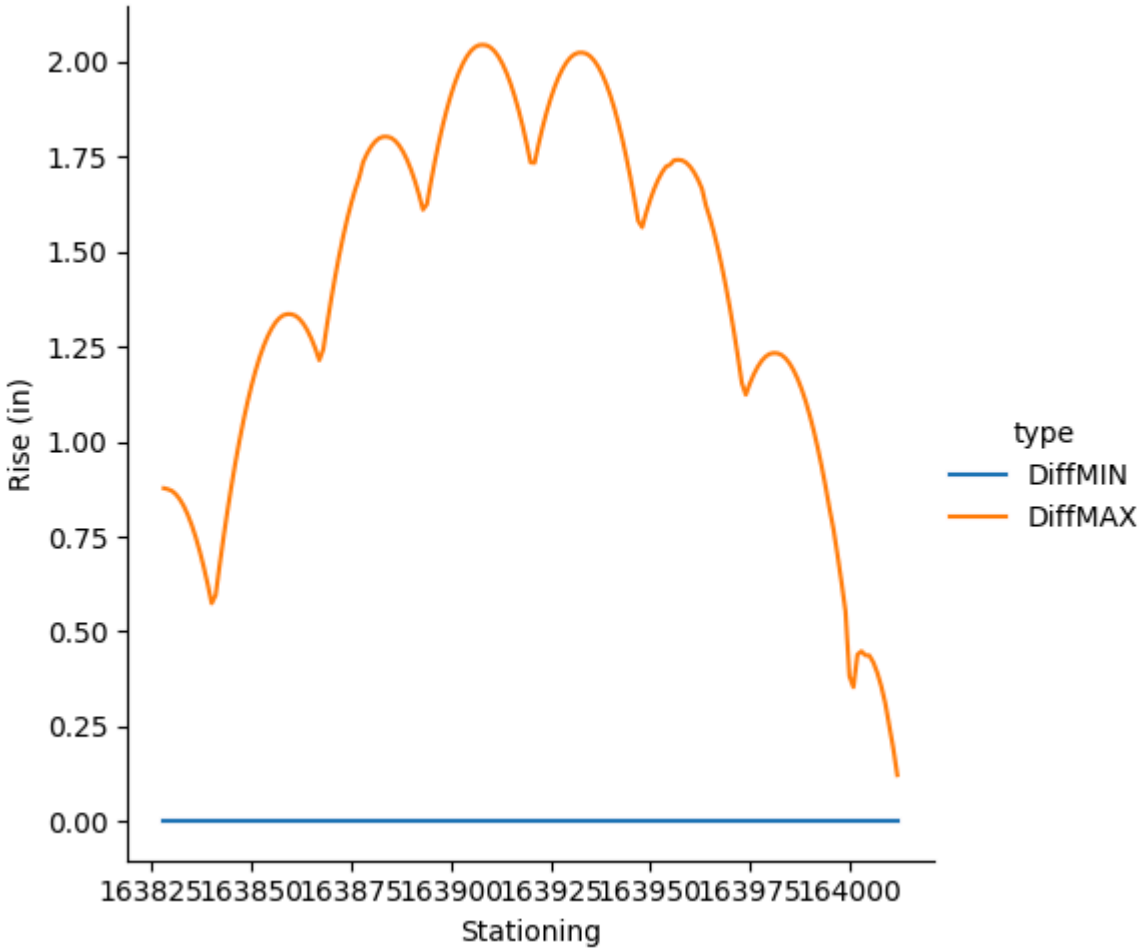
In [8]:
```
Nominal = OCS.CatenaryFlexible(cN, wr)
Nominal._solve()
Elasticity = OCS.Elasticity(cN, Nominal, UpliftForce, SpanStepSize, StartSPT+3, EndSPT
```

```
Checking elasticity from STA 163828.0 to STA 164013.0
 |  185 total cycles estimating to take 138.75 seconds
185  total loops processed in 485.7187 seconds with average cycle time of 2625.5064 m
illiseconds
```

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

In [9]:
```
Elasticity.plot()
```

Out[9]:
```
<seaborn.axisgrid.FacetGrid at 0x21107a9f510>
```



In [10]:
```
Elasticity.savetocsv('_output.elasticity.csv')
```