select-shapes

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0.1 Alternative Tension Members for Example TD40

In [1]:
```
# import useful utilities
from sst import SST
sst = SST()
from utils import show
```

0.1.1 HSS Shapes

In [2]:
```
hss = sst.section_tables(['HS'],'Mass')
hss.query('A>2500 & B==D').head(10)[['A','T','Mass']]
```

Out[2]:

Dsg	A	T	Mass
HS114x114x6.4	2640.0	6.35	20.7
HS152x152x4.8	2760.0	4.78	21.7
HS89x89x9.5	2790.0	9.53	21.9
HS102x102x8.0	2820.0	7.95	22.1
HS127x127x6.4	2960.0	6.35	23.2
HS114x114x8.0	3220.0	7.95	25.3
HS178x178x4.8	3250.0	4.78	25.5
HS102x102x9.5	3280.0	9.53	25.7
HS152x152x6.4	3610.0	6.35	28.3
HS127x127x8.0	3620.0	7.95	28.4

0.1.2 Angle shapes (4 and 2 angles)

In [3]:
```
hss = sst.section_tables(['L'],'Mass')
hss.query('A>2500/4 & Avl!="*"').head(10)[['A','T','Mass']]    # 4 angles
```

Out[3]:

Dsg	A	T	Mass
L64x51x6.4	685.0	6.35	5.38
L76x76x4.8	703.0	4.76	5.52
L51x51x7.9	744.0	7.94	5.84
L76x51x6.4	766.0	6.35	6.01
L64x64x6.4	766.0	6.35	6.01
L64x51x7.9	844.0	7.94	6.63

```
L76x64x6.4   847.0   6.35   6.65
L51x51x9.5   877.0   9.53   6.89
L89x64x6.4   927.0   6.35   7.28
L76x76x6.4   927.0   6.35   7.28
```

```
In [4]: hss.query('A>2500/2 & Avl!="*"').head(10)[['A','T','Mass']]     # 2 angles
```

Out[4]:

Dsg	A	T	Mass
L102x102x6.4	1260.0	6.35	9.85
L127x89x6.4	1330.0	6.35	10.40
L102x76x7.9	1350.0	7.94	10.60
L89x89x7.9	1350.0	7.94	10.60
L76x76x9.5	1360.0	9.53	10.70
L89x64x9.5	1360.0	9.53	10.70
L76x51x13	1450.0	12.70	11.40
L64x64x13	1450.0	12.70	11.40
L102x89x7.9	1450.0	7.94	11.40
L89x76x9.5	1480.0	9.53	11.60

0.1.3 Channels

```
In [5]: hss = sst.section_tables(['C'],'Mass')
        hss.query('A>2500/2 & Avl!="*"').head(10)[['A','Mass']]
```

Out[5]:

Dsg	A	Mass
C130x10	1260.0	10.0
C100x11	1370.0	11.0
C150x12	1530.0	12.0
C130x13	1690.0	13.0
C180x15	1850.0	15.0
C150x16	1980.0	16.0
C200x17	2170.0	17.0
C180x18	2310.0	18.0
C150x19	2450.0	19.0
C230x20	2530.0	20.0

0.1.4 W Shapes

```
In [6]: hss = sst.section_tables(['W'],'Mass')
        hss.query('A>2500 & Avl!="*"').head(10)[['A','Mass']]
```

Out[6]:

Dsg	A	Mass
W310x21	2690.0	21.0
W200x21	2700.0	21.0
W200x22	2860.0	22.0
W250x22	2850.0	22.0

```
W150x22  2860.0  22.0
W310x24  3040.0  24.0
W250x24  3110.0  24.0
W250x25  3230.0  25.0
W200x27  3390.0  27.0
W310x28  3610.0  28.0
```

0.1.5 WT Shapes

These are not very practical, but possible if flange-bolted.

```
In [7]: hss = sst.section_tables(['WT'],'Mass')
        hss.query('A>2500').head(10)[['Avl','A','T','Mass']]
```

Out[7]:

Dsg	Avl	A	T	Mass
WT100x21	*	2660.0	11.8	21.0
WT155x22.5	*	2850.0	11.2	22.5
WT180x22.5	*	2870.0	9.8	22.5
WT125x22.5	*	2860.0	13.0	22.5
WT100x23	*	2930.0	11.0	23.0
WT205x23	*	2950.0	11.2	23.0
WT125x24.5	*	3130.0	11.0	24.5
WT180x25.5	*	3230.0	11.6	25.5
WT155x26	*	3340.0	13.2	26.0
WT230x26	*	3310.0	10.8	26.0

```
In [ ]:
```