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Anejo I. Resultados del tubo de sección Ø 711 mm

En este anejo vamos a ver los resultados obtenidos del software de cálculo ANSYS para la pasarela con los tubos de diámetro 711 mm que fue con los primeros que hicimos el tanteo ya que fue el que obtuvimos del predimensionamiento.

1.1 Resultados de esfuerzos

Vamos a ver en primer lugar los resultados de los esfuerzos en el tubo de la directriz cargando las diferentes combinaciones de carga, estos resultados se han tratado y una vez obtenidos en ANSYS se han pasado a un Excel para poder ordenarlos y ahora poder poner imágenes directamente desde el propio Excel.

1.1.1 Tubo

ELU					
11					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-14824.	-1717.0	-1478.4	-886.02	-1284.2
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	3509.1	1741.1	6418.9	964.48	1305.9

12					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-11921.	-1334.2	-1199.1	-732.30	-948.48
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2466.7	1354.1	4972.8	729.50	965.22

13					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-13240.	-1337.8	-1351.9	-768.57	-786.39
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1671.2	1360.5	4945.8	693.35	803.35

14					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-11750.	-1313.5	-1180.3	-678.52	-918.40
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2389.4	1331.3	4890.1	726.21	937.82

15					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-13085.	-1317.3	-1336.9	-759.67	-768.86
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1614.9	1339.7	4868.1	681.16	785.58

16					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-11921.	-1334.2	-1199.1	-732.30	-948.48
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2466.7	1354.1	4972.8	729.50	965.22

17					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-14664.	-1696.4	-1462.3	-863.66	-1262.9
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	3446.6	1719.7	6339.6	954.96	1285.3

18					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-11750.	-1313.5	-1180.3	-678.52	-918.40
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2389.4	1331.3	4890.1	726.21	937.82

19					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-13080.	-1317.2	-1335.7	-746.20	-765.09
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1608.6	1339.1	4866.6	683.83	782.69

20					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-11921.	-1334.2	-1199.1	-732.30	-948.48
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2466.7	1354.1	4972.8	729.50	965.22

21					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-14541.	-1678.0	-1449.5	-856.18	-1246.9
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	3399.5	1701.6	6271.5	942.93	1268.1

22					
MINIMUM VALUES					
ELEM	14781	14782	14082	13481	14682
VALUE	-12729.	-1689.8	-1354.1	-784.59	-1493.7
MAXIMUM VALUES					
ELEM	13981	13181	14782	13482	13182
VALUE	4758.4	1709.1	6377.2	1018.1	1515.0

23					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-14669.	-1696.5	-1463.4	-877.12	-1266.7
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	3452.9	1720.3	6341.2	952.29	1288.2

24					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-11766.	-1313.7	-1184.1	-723.40	-930.96
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2410.4	1333.3	4895.1	717.31	947.45

25					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-13085.	-1317.3	-1336.9	-759.67	-768.86
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1614.9	1339.7	4868.1	681.16	785.58

26					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-14832.	-1716.8	-1477.8	-873.77	-1280.6
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	3505.7	1740.8	6417.8	966.03	1302.4

27					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12311.	-1381.2	-1232.0	-712.25	-977.41
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2586.6	1401.4	5150.8	763.11	994.85

28					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-13248.	-1337.5	-1351.3	-756.32	-782.80
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1667.8	1360.1	4944.8	694.90	799.80

29					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12957.	-1298.8	-1323.0	-738.73	-749.01
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1561.6	1320.9	4798.5	671.81	765.52

30					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12311.	-1381.2	-1232.0	-712.25	-977.41
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2586.6	1401.4	5150.8	763.11	994.85

31					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-11766.	-1313.7	-1184.1	-723.40	-930.96
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2410.4	1333.3	4895.1	717.31	947.45

ELS

32					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10815.	-1268.5	-1075.8	-646.90	-965.59
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2678.8	1286.0	4746.5	717.25	981.63

33					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8666.8	-984.89	-868.82	-530.91	-716.27
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1906.0	999.25	3675.2	543.46	728.63

34					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-9545.7	-987.30	-970.68	-555.09	-608.21
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1375.7	1003.5	3657.2	519.36	620.71

35					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8563.6	-971.19	-858.84	-524.98	-704.59
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1868.5	985.40	3623.5	535.34	716.78

36					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8920.8	-1016.4	-891.18	-525.71	-737.95
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1988.2	1031.0	3794.6	564.83	750.75

37					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8666.8	-984.89	-868.82	-530.91	-716.27
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1906.0	999.25	3675.2	543.46	728.63

38					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10709.	-1254.8	-1065.1	-631.99	-951.40
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2637.0	1271.7	4693.7	710.91	967.85

39					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8552.8	-971.10	-856.28	-495.06	-696.22
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1854.4	984.04	3620.1	541.27	710.36

40					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-9439.2	-973.57	-959.93	-540.18	-594.01
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1333.9	989.23	3604.4	513.02	606.94

41					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8920.8	-1016.4	-891.18	-525.71	-737.95
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1988.2	1031.0	3794.6	564.83	750.75

42					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10627.	-1242.5	-1056.6	-627.01	-940.68
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2605.7	1259.6	4648.3	702.89	956.41

43					
MINIMUM VALUES					
ELEM	14781	14782	14082	13481	14682
VALUE	-9418.8	-1250.4	-1002.0	-580.56	-1105.2
MAXIMUM VALUES					
ELEM	13981	13181	14782	13482	13182
VALUE	3521.0	1264.7	4718.8	753.34	1121.0

44					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10712.	-1254.8	-1065.9	-640.96	-953.91
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2641.2	1272.1	4694.7	709.13	969.78

45					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8563.6	-971.19	-858.84	-524.98	-704.59
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1868.5	985.40	3623.5	535.34	716.78

46					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-9442.4	-973.60	-960.70	-549.16	-596.53
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1338.1	989.63	3605.4	511.24	608.86

47					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10821.	-1268.3	-1075.4	-638.73	-963.20
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2676.5	1285.7	4745.9	718.28	979.26

48					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8926.4	-1016.2	-890.77	-517.55	-735.56
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1985.9	1030.7	3793.9	565.87	748.38

49					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-9551.3	-987.11	-970.28	-546.93	-605.82
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1373.4	1003.2	3656.6	520.40	618.34

50					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-9357.1	-961.30	-951.41	-535.20	-583.29
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1302.6	977.13	3559.0	505.00	595.49

51					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10712.	-1254.8	-1065.9	-640.96	-953.91
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	2641.2	1272.1	4694.7	709.13	969.78

52					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8926.4	-1016.2	-890.77	-517.55	-735.56
MAXIMUM VALUES					
ELEM	12481	13181	14782	13582	13182
VALUE	1985.9	1030.7	3793.9	565.87	748.38

1.1.2 Estribos

ESTRIBOS

ELU

11					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-7394.0	-3755.2	-7626.1	-266.73	-524.54
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2035.4	3794.9	3422.8	1333.0	565.01

12					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5809.0	-2947.7	-5983.6	-170.50	-437.57
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1635.9	2981.4	2691.9	1089.9	470.98

13					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5700.2	-2890.0	-5838.8	-72.604	-473.90
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1500.4	2920.7	2650.5	1140.9	505.83

14					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5616.6	-2846.5	-5755.3	-170.20	-415.40
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1490.9	2863.8	2580.1	1023.5	440.37

15					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5613.7	-2845.9	-5749.3	-67.702	-468.66
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1477.7	2876.2	2610.1	1127.0	500.14

16					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5809.0	-2947.7	-5983.6	-170.50	-437.57
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1635.9	2981.4	2691.9	1089.9	470.98

17					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-7275.7	-3693.9	-7495.0	-263.21	-514.22
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1976.0	3728.4	3361.0	1303.4	551.84

18					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5616.6	-2846.5	-5755.3	-170.20	-415.40
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1490.9	2863.8	2580.1	1023.5	440.37

19					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5581.9	-2828.8	-5707.7	-69.080	-463.58
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1441.0	2854.3	2588.7	1111.2	492.66

20					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5809.0	-2947.7	-5983.6	-170.50	-437.57
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1635.9	2981.4	2691.9	1089.9	470.98

21					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-7190.4	-3651.1	-7411.0	-258.94	-508.46
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1949.9	3688.7	3328.2	1292.2	547.25

22					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-7300.6	-3709.5	-7560.1	-415.21	-437.72
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2038.4	3747.8	3365.2	1180.3	476.32

23					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-7307.5	-3711.1	-7536.6	-261.83	-519.30
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2012.7	3750.3	3382.5	1319.1	559.32

24					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5722.5	-2903.6	-5894.1	-165.60	-432.33
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1613.3	2936.9	2651.6	1076.0	465.29

25					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5613.7	-2845.9	-5749.3	-67.702	-468.66
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1477.7	2876.2	2610.1	1127.0	500.14

26					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-7356.2	-3735.6	-7583.0	-268.18	-518.52
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1995.9	3774.1	3405.2	1319.2	558.18

27					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5885.0	-2985.3	-6048.7	-186.78	-429.73
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1557.3	3016.0	2727.1	1076.3	461.50

28					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5662.5	-2870.4	-5795.7	-74.056	-467.88
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1460.9	2899.9	2632.8	1127.1	499.00

29					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5496.6	-2785.9	-5623.7	-64.814	-457.82
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1415.0	2814.5	2555.9	1100.0	488.07

30					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5885.0	-2985.3	-6048.7	-186.78	-429.73
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1557.3	3016.0	2727.1	1076.3	461.50

31					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5722.5	-2903.6	-5894.1	-165.60	-432.33
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1613.3	2936.9	2651.6	1076.0	465.29

ELS					
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32					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5464.3	-2775.2	-5637.9	-208.25	-381.76
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1506.2	2804.5	2528.4	975.15	411.57

33					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4283.7	-2173.7	-4413.8	-137.23	-316.29
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1203.5	2198.3	1984.0	792.65	340.74

34					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4211.1	-2135.3	-4317.3	-71.961	-340.51
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1113.1	2157.9	1956.4	826.66	363.97

35					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4226.0	-2144.3	-4354.2	-133.96	-312.80
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1188.4	2168.6	1957.1	783.37	336.94

36					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4359.5	-2211.8	-4486.0	-147.11	-315.08
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1177.4	2235.3	2019.2	792.79	338.97

37					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4283.7	-2173.7	-4413.8	-137.23	-316.29
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1203.5	2198.3	1984.0	792.65	340.74

38					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5385.4	-2734.4	-5550.5	-205.91	-374.88
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1466.6	2760.2	2487.3	955.36	402.79

39					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4155.4	-2106.3	-4261.6	-137.02	-301.52
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1106.8	2119.9	1909.4	748.36	320.33

40					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4132.3	-2094.5	-4229.9	-69.612	-333.64
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1073.5	2113.6	1915.2	806.87	355.19

41					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4359.5	-2211.8	-4486.0	-147.11	-315.08
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1177.4	2235.3	2019.2	792.79	338.97

42					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5328.5	-2705.8	-5494.6	-203.06	-371.04
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1449.2	2733.7	2465.4	947.90	399.73

43					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5402.0	-2744.8	-5594.0	-307.24	-323.88
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1508.2	2773.1	2490.1	873.35	352.44

44					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5406.6	-2745.8	-5578.3	-204.99	-378.27
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1491.1	2774.8	2501.6	965.86	407.77

45					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4226.0	-2144.3	-4354.2	-133.96	-312.80
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1188.4	2168.6	1957.1	783.37	336.94

46					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4153.4	-2105.9	-4257.7	-68.693	-337.02
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1098.0	2128.2	1929.5	817.37	360.18

47					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5439.1	-2762.2	-5609.2	-209.22	-377.75
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1479.9	2790.6	2516.7	965.92	407.01

48					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4334.3	-2198.8	-4457.3	-148.08	-311.07
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1151.1	2221.4	2007.5	783.56	334.42

49					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4185.9	-2122.2	-4288.6	-72.929	-336.50
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1086.8	2144.0	1944.6	817.43	359.42

50					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4075.4	-2065.9	-4173.9	-66.767	-329.80
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1056.2	2087.1	1893.3	799.41	352.13

51					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-5406.6	-2745.8	-5578.3	-204.99	-378.27
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1491.1	2774.8	2501.6	965.86	407.77

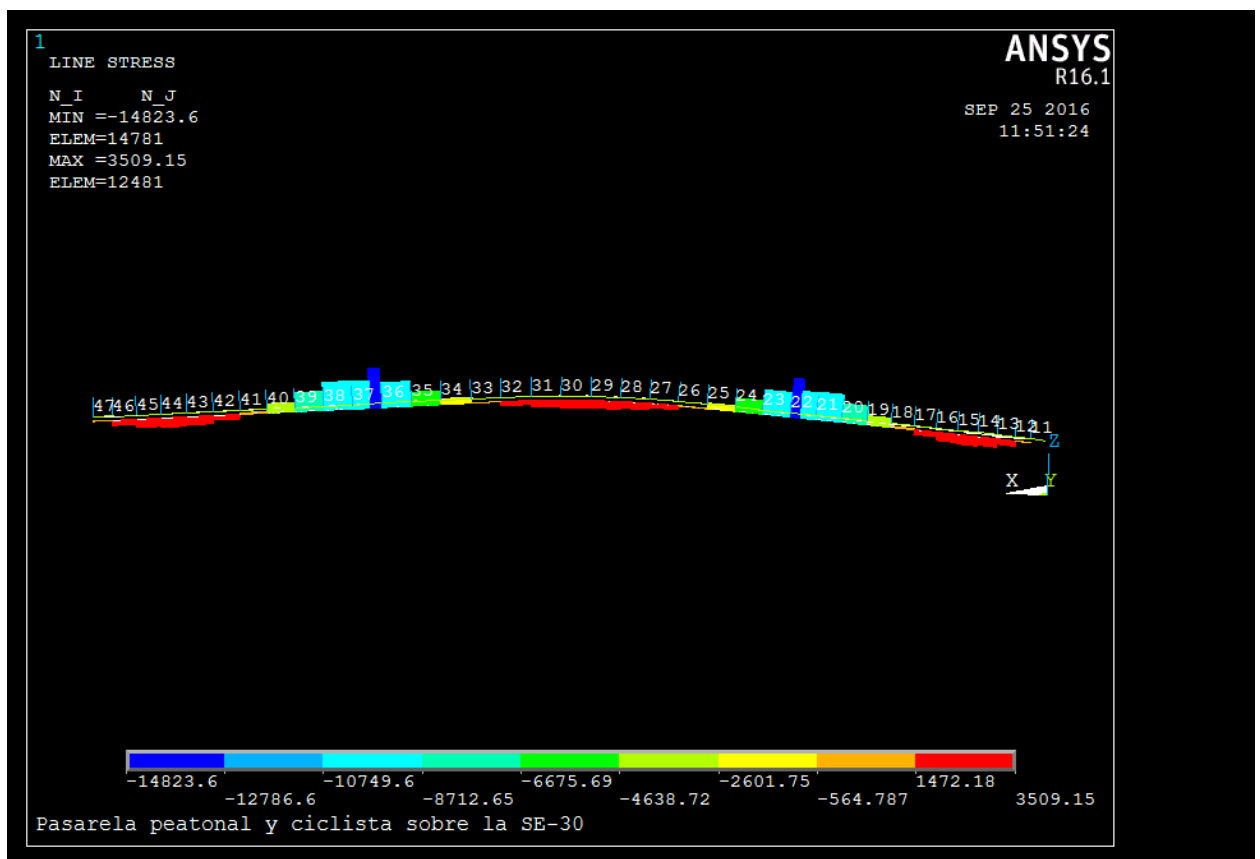
52					
MINIMUM VALUES					
ELEM	16896	16854	16883	16856	16867
VALUE	-4334.3	-2198.8	-4457.3	-148.08	-311.07
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1151.1	2221.4	2007.5	783.56	334.42

1.2 Diagramas de esfuerzo

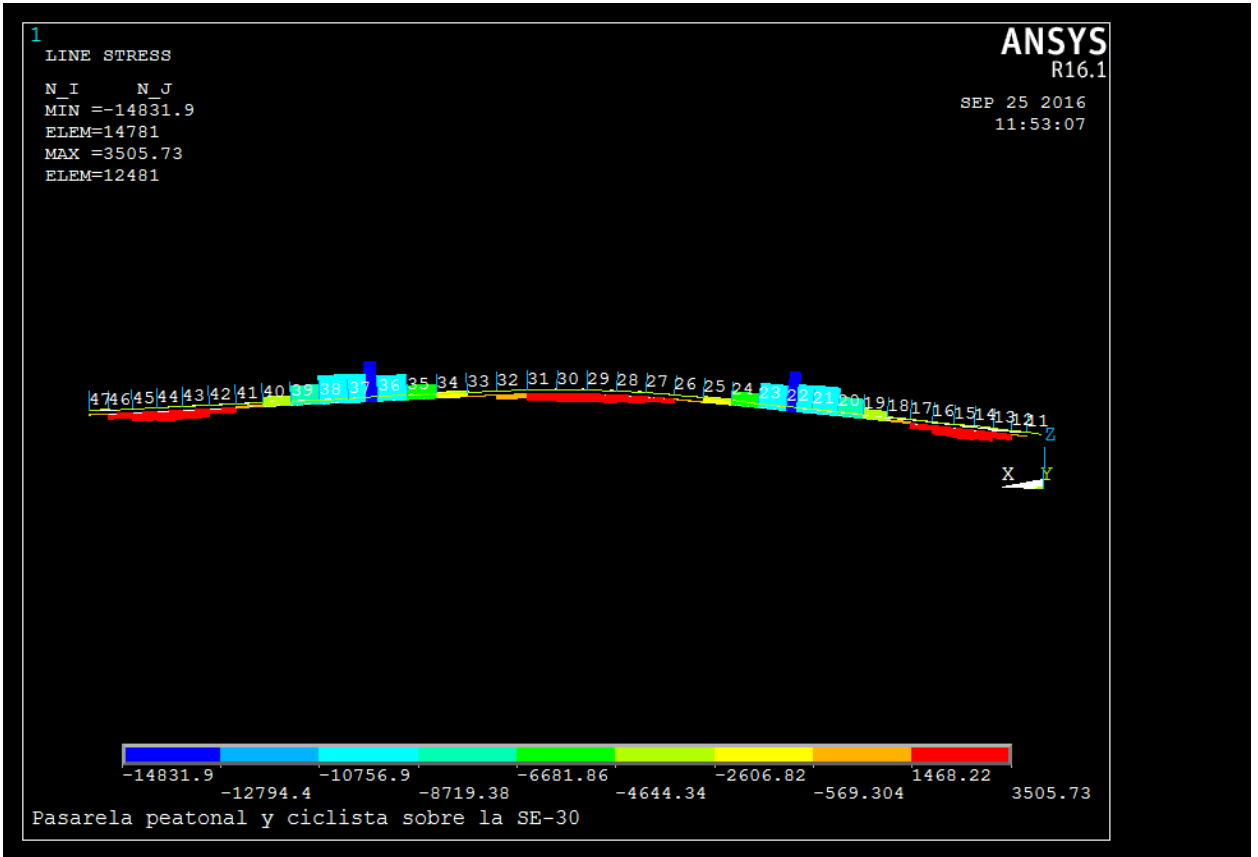
Vamos a ver en esta parte del anejo los diferentes diagramas de esfuerzo que se han obtenido para las combinaciones de carga que tuvieron algún esfuerzo más desfavorable. Para ello se ha diferenciado en diagramas de esfuerzo del tubo y de los estribos por separado y de la misma manera para los Estados Límite Último y los Estados Límites de Servicio.

1.2.1 Tubo

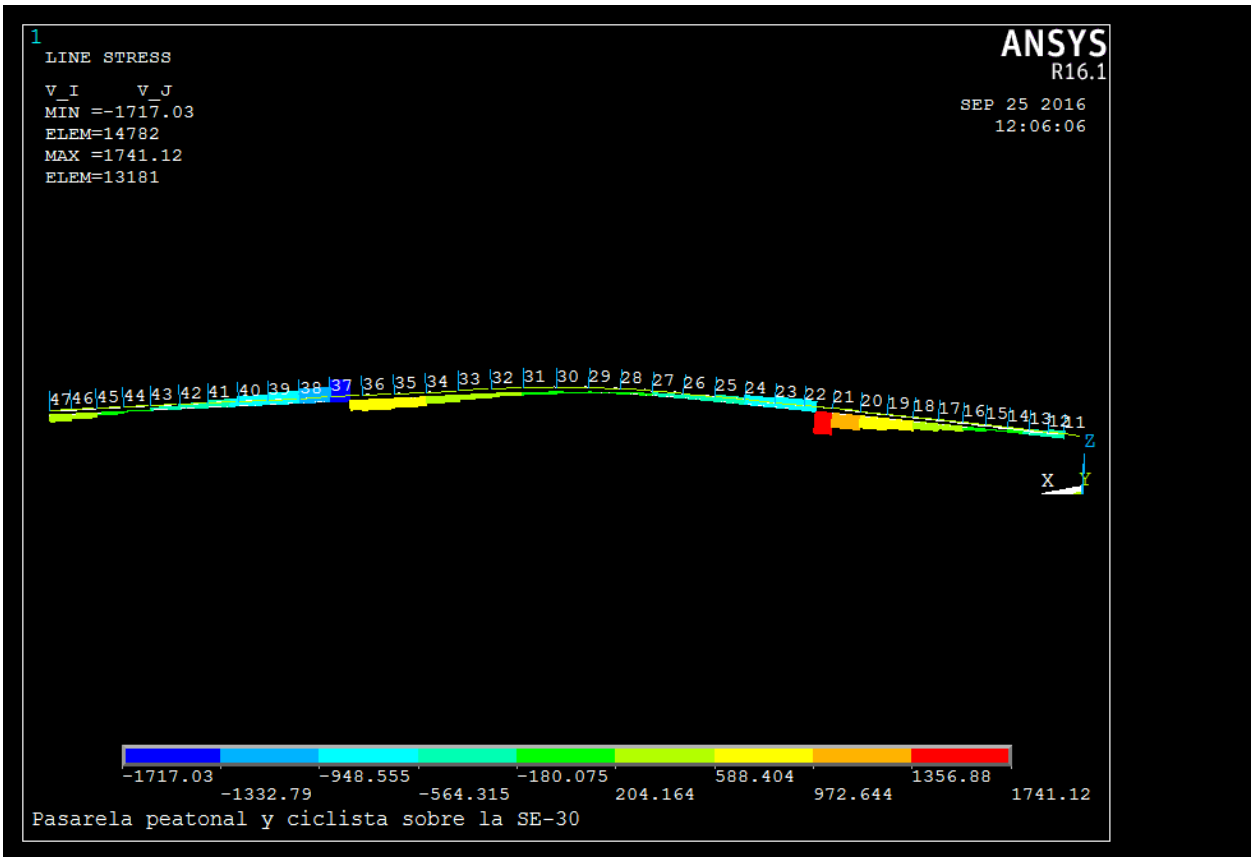
1.2.1.1 ELU



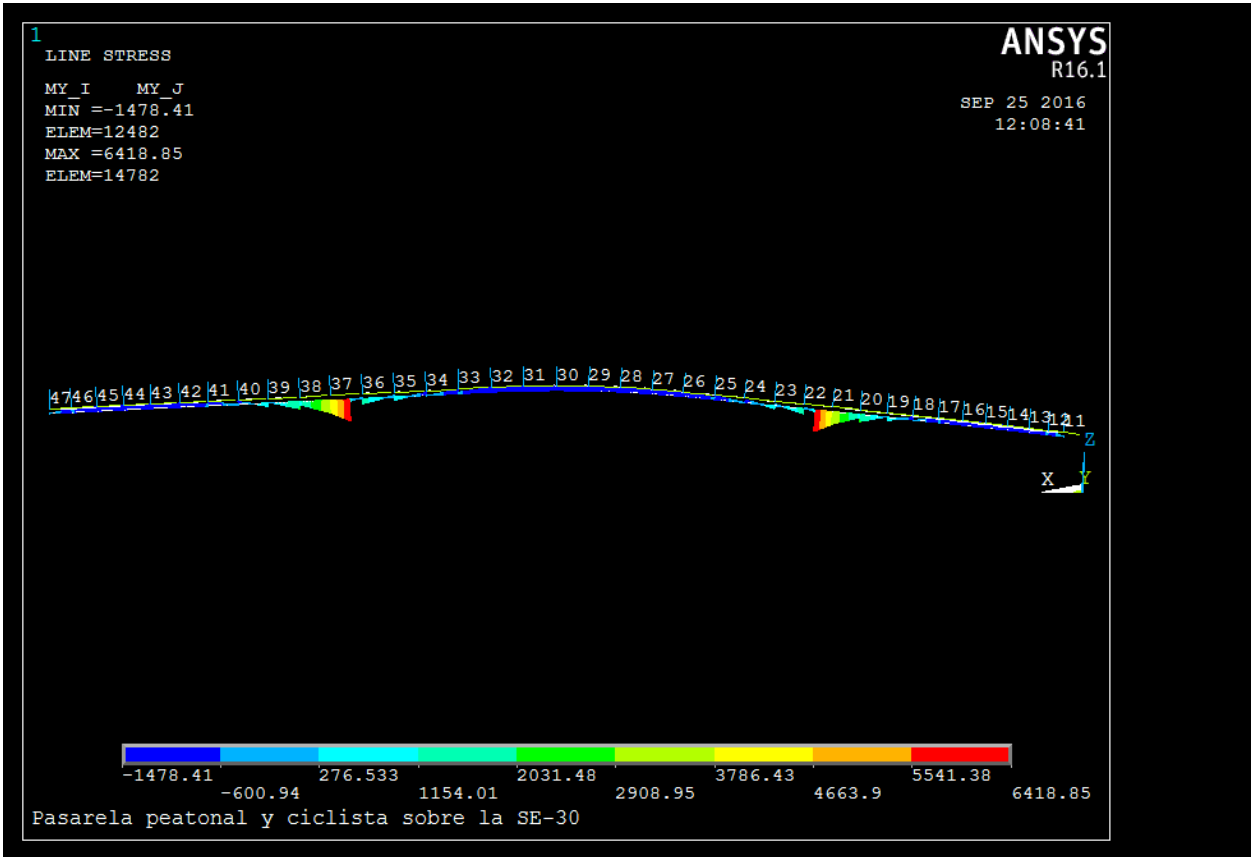
Máximo axil positivo



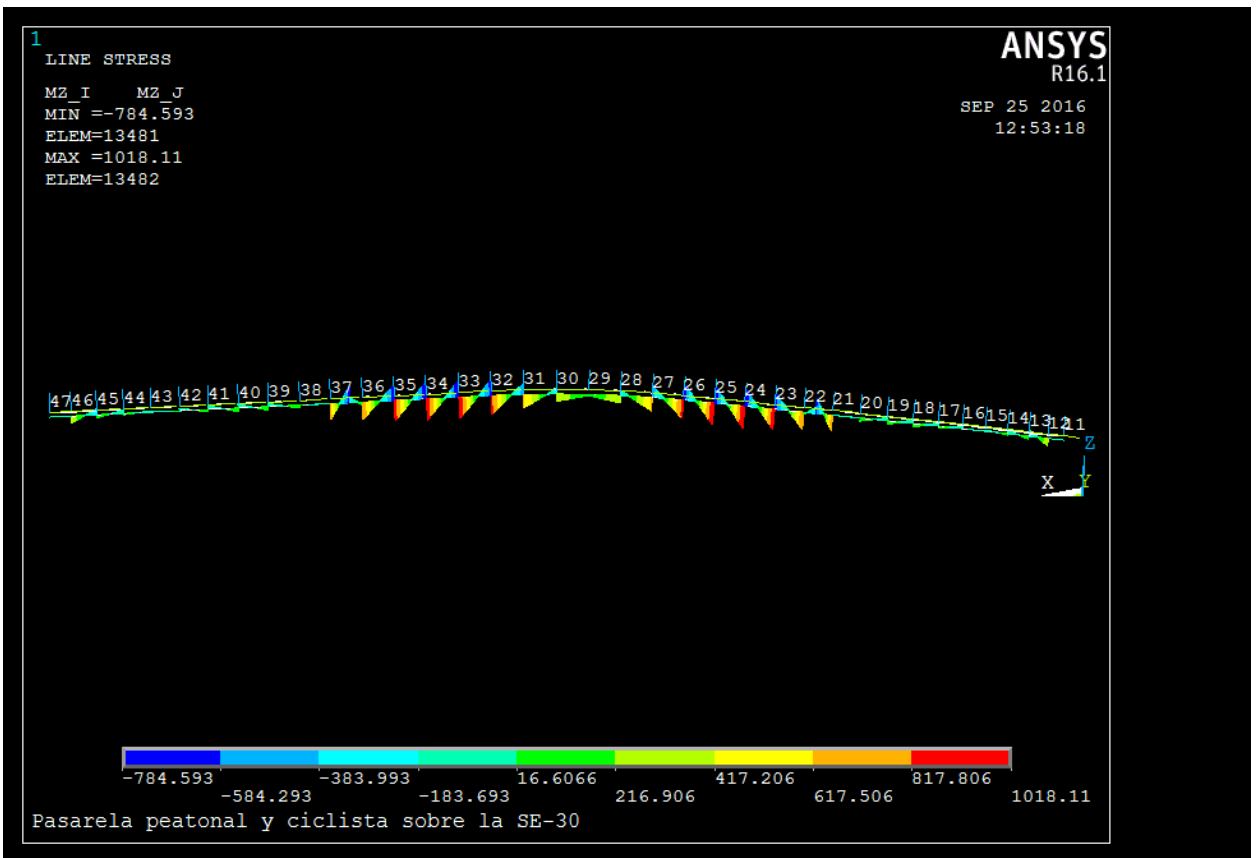
Máximo axil negativo



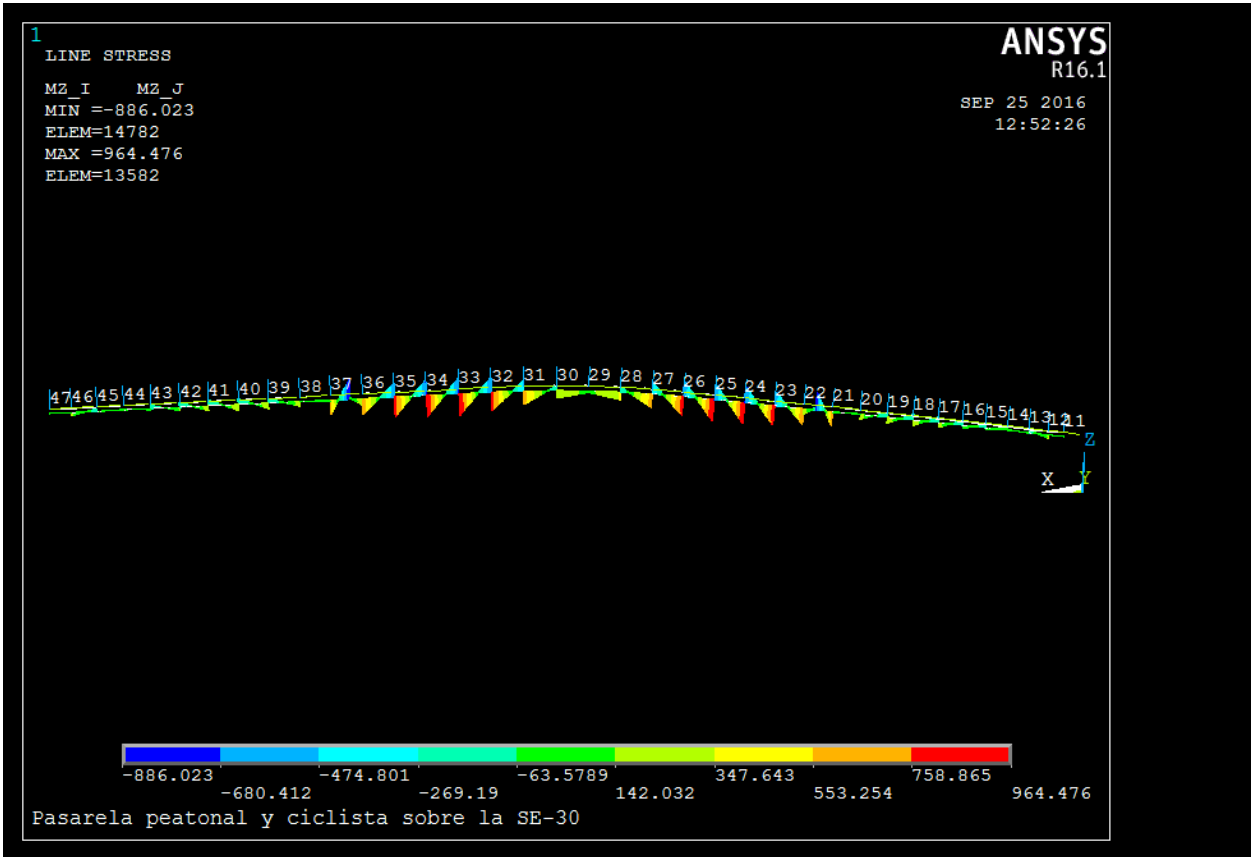
Máximo cortante positivo y negativo



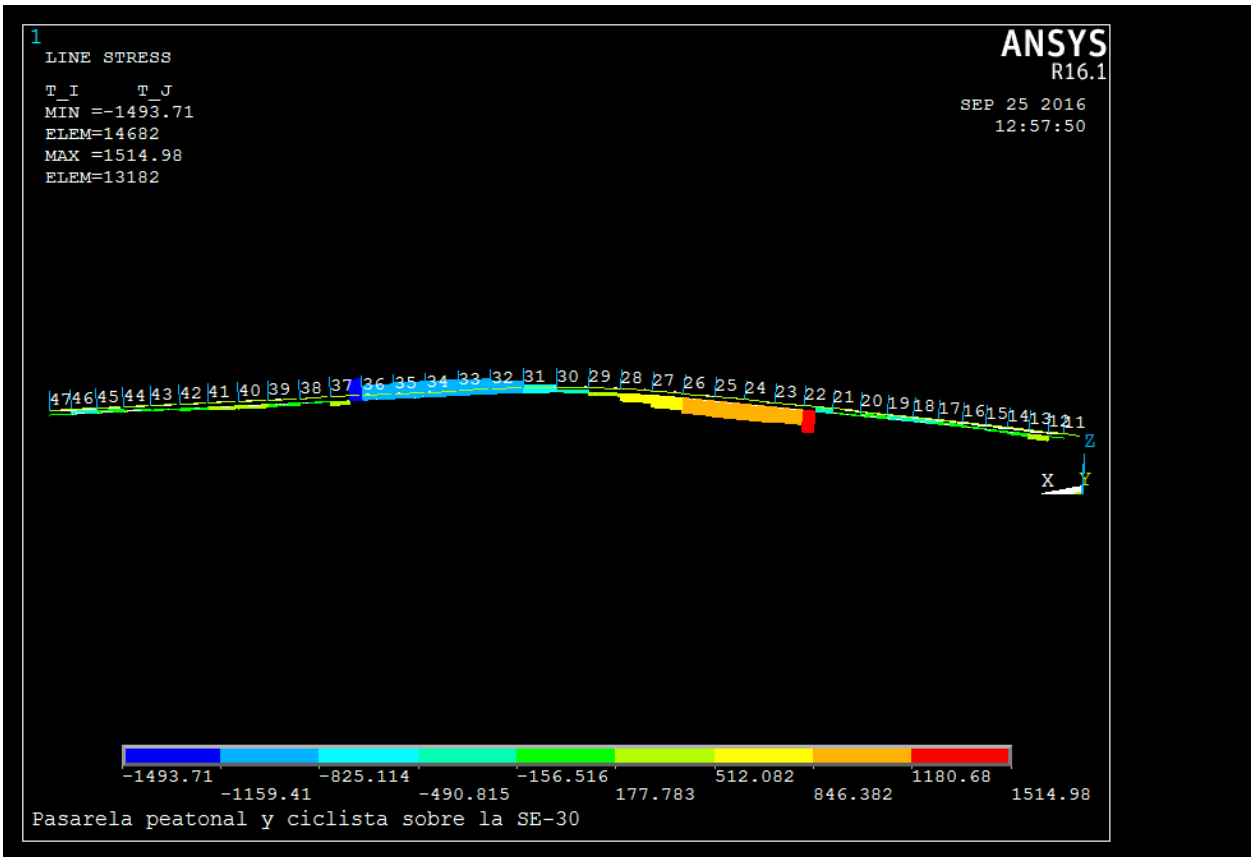
Máximo momento Y positivo y negativo



Máximo momento Z positivo

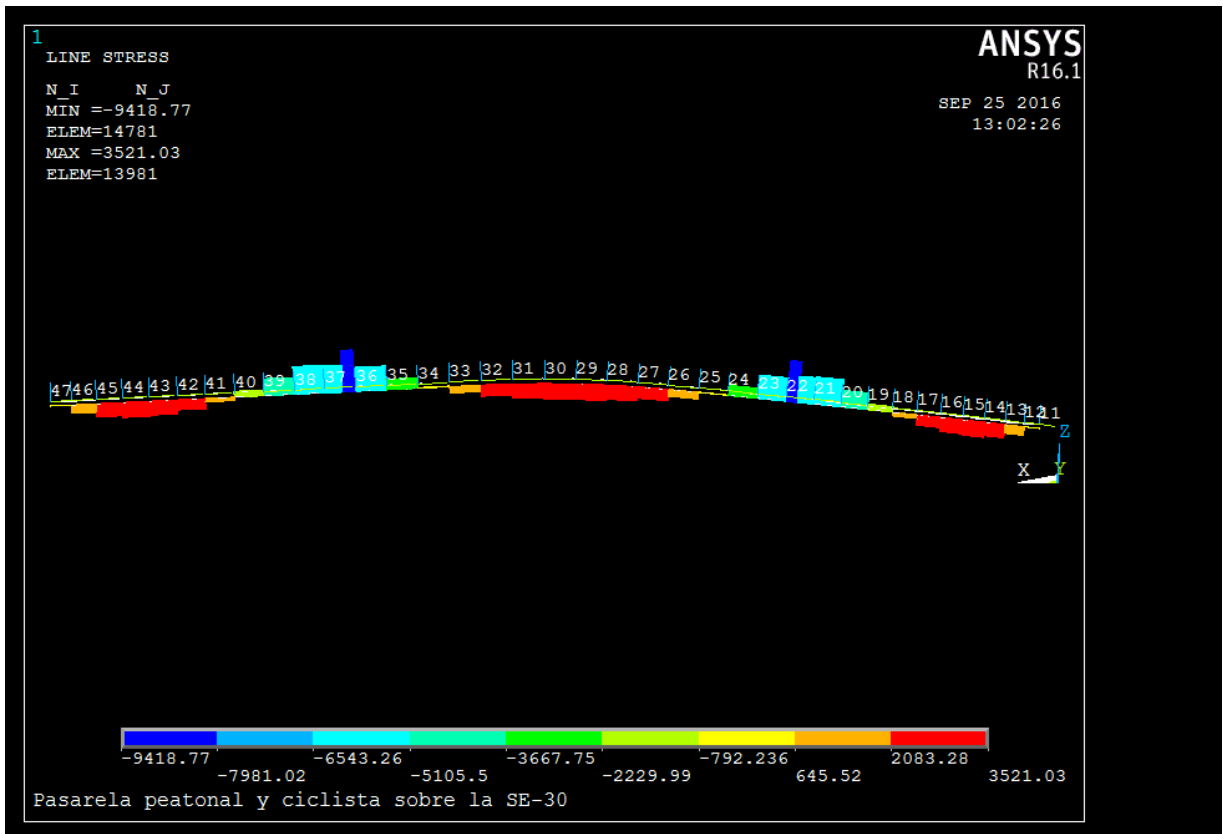


Máximo momento Z negativo

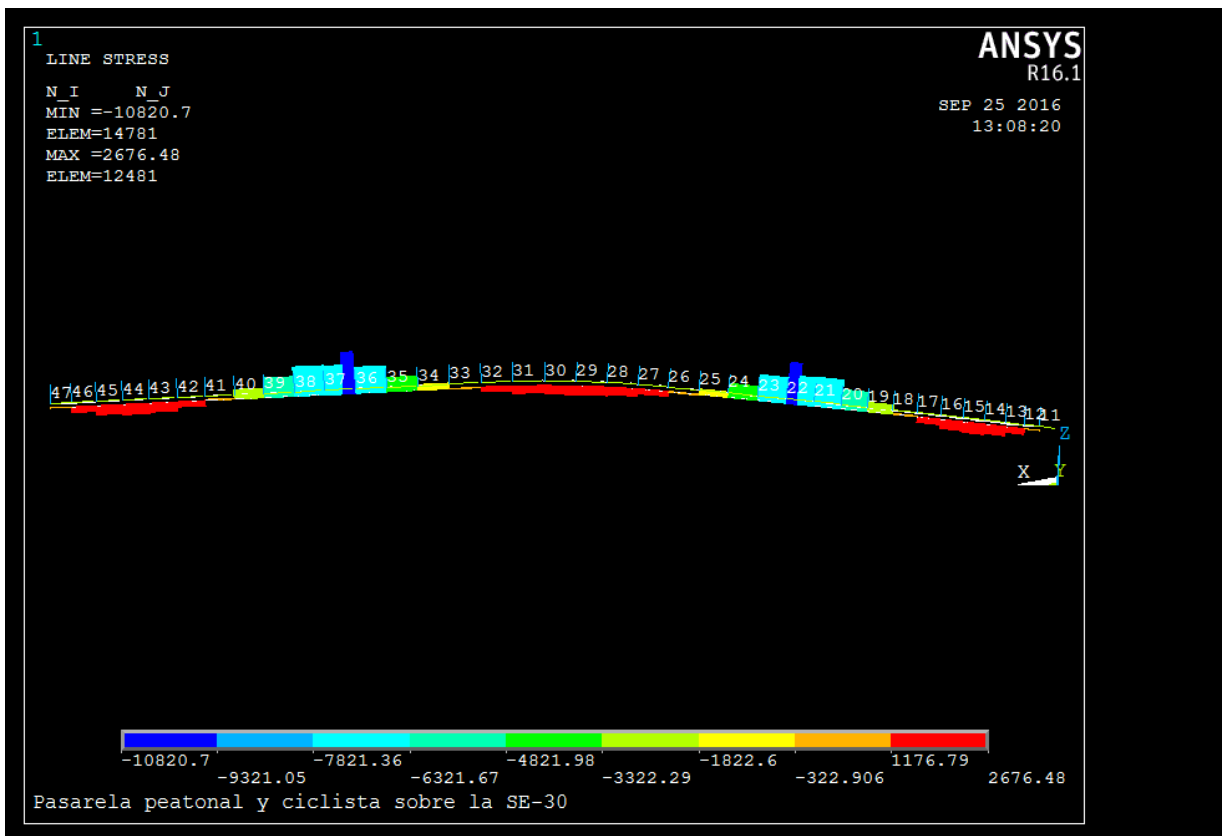


Máximo torsor positivo y negativo

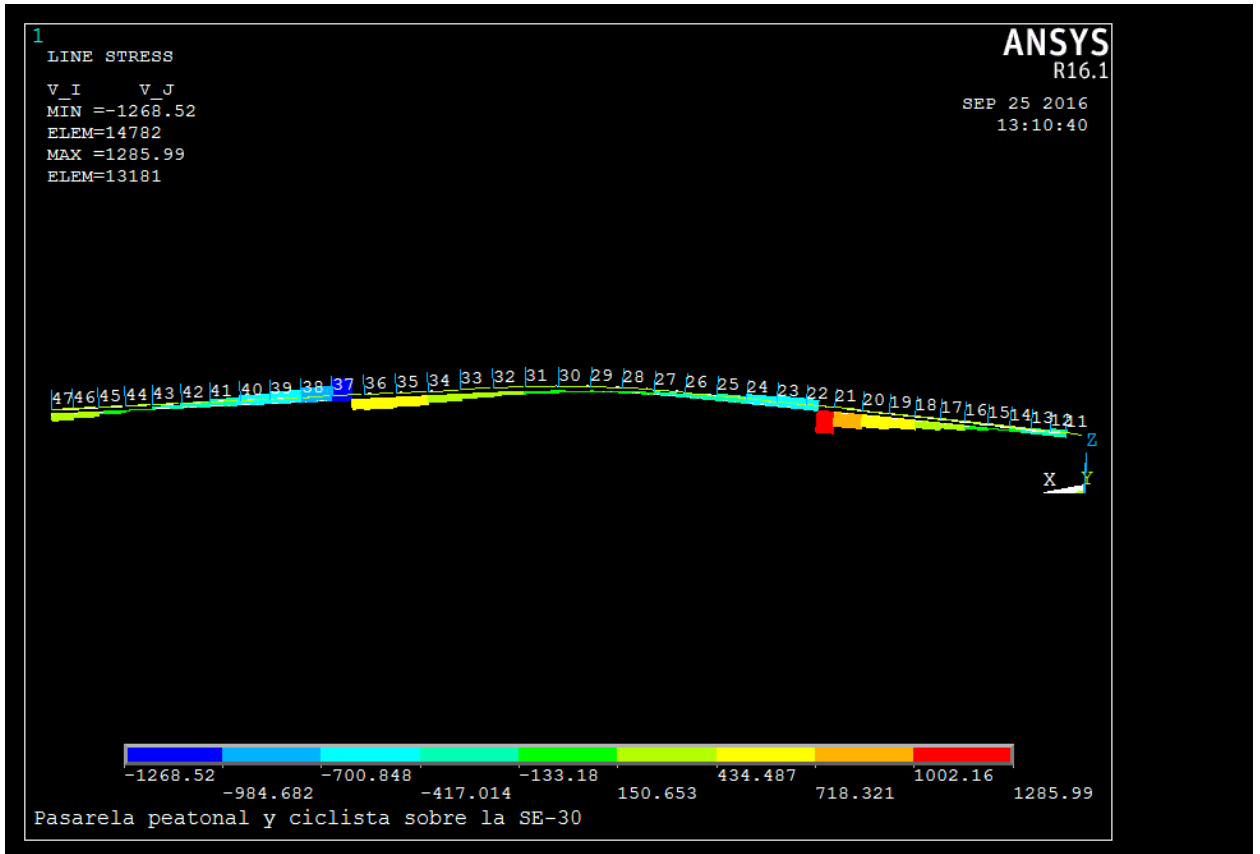
1.2.1.2 ELS



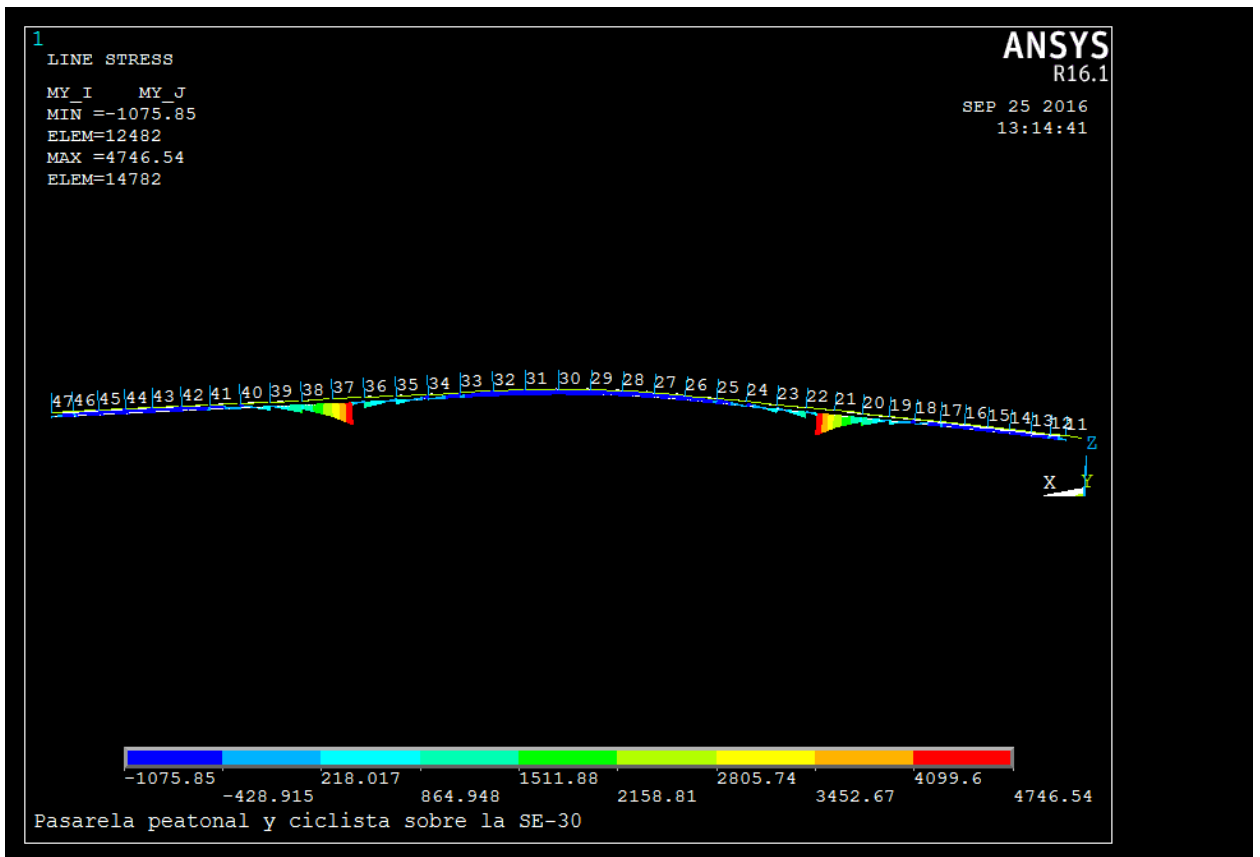
Máximo axil positivo



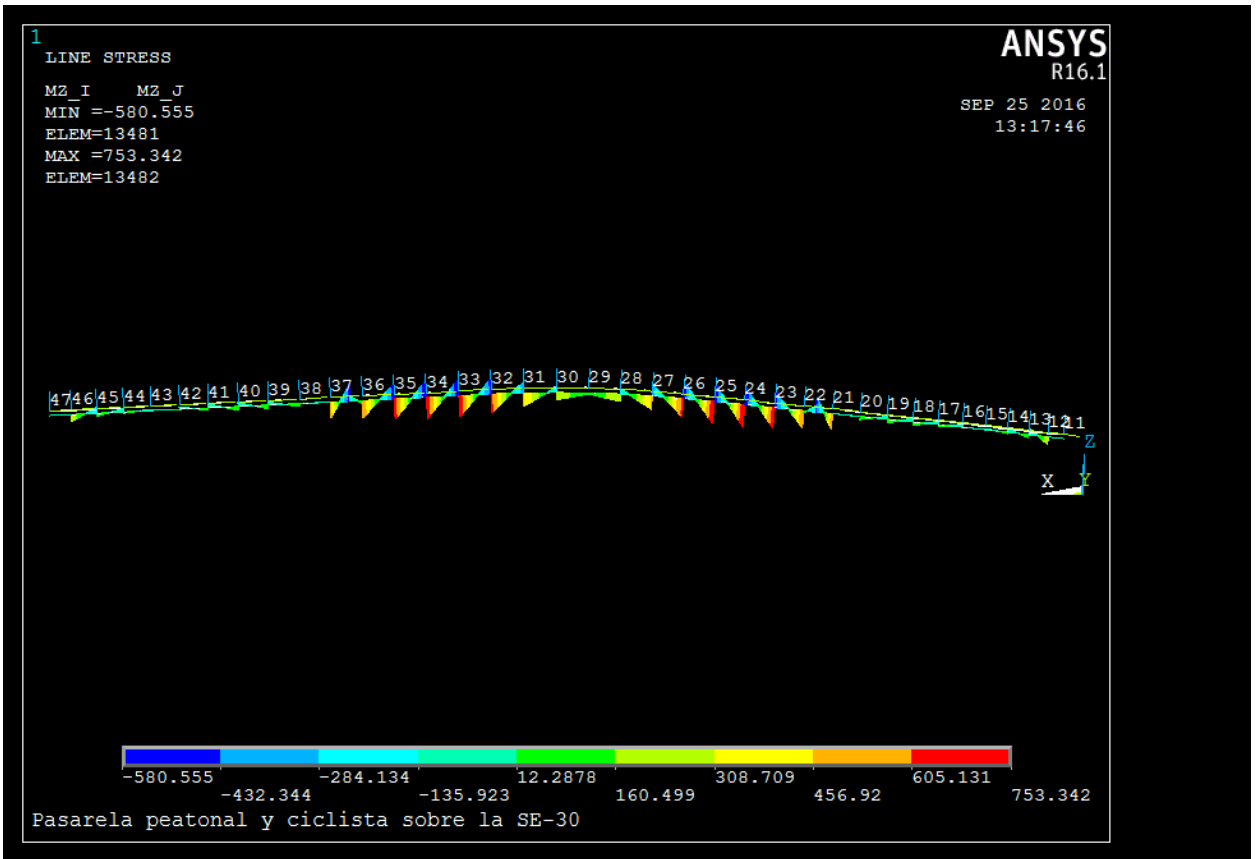
Máximo axil negativo



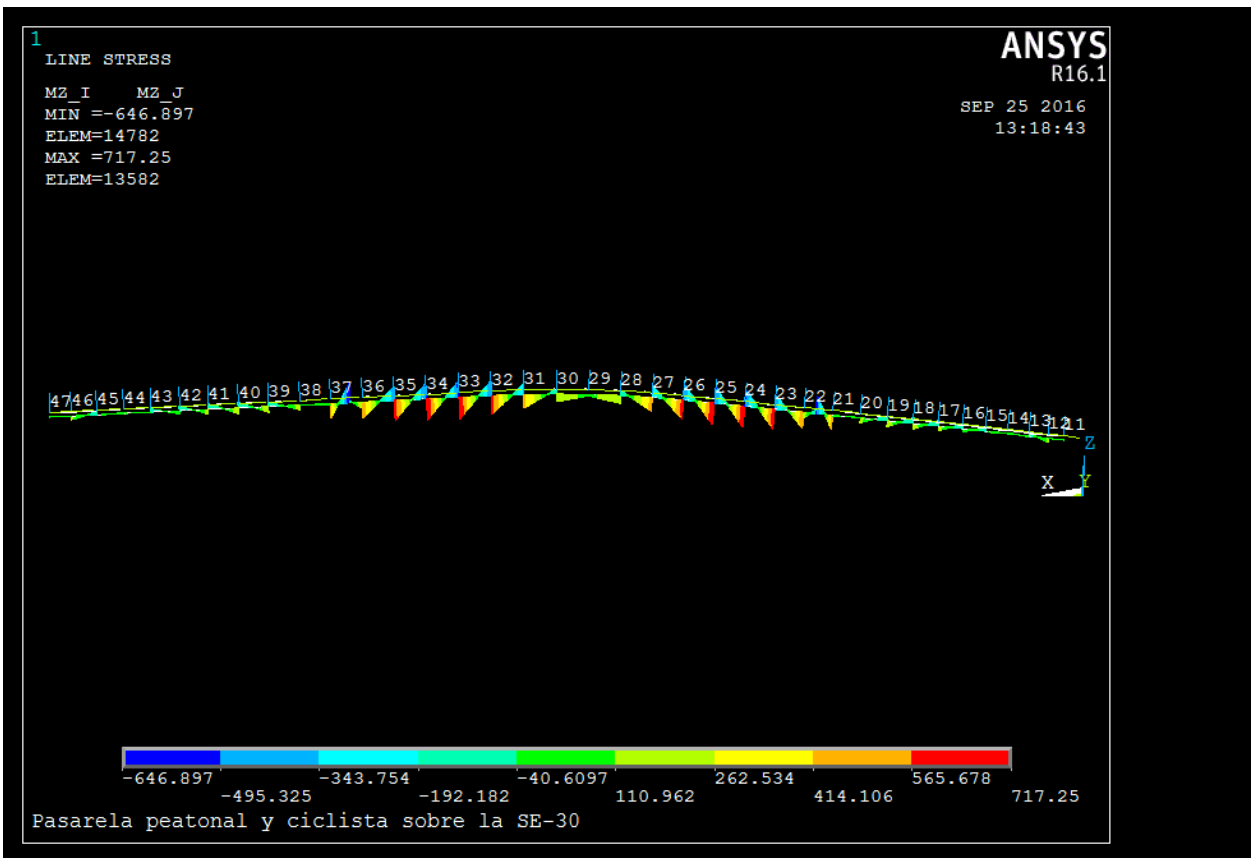
Máximo cortante positivo y negativo



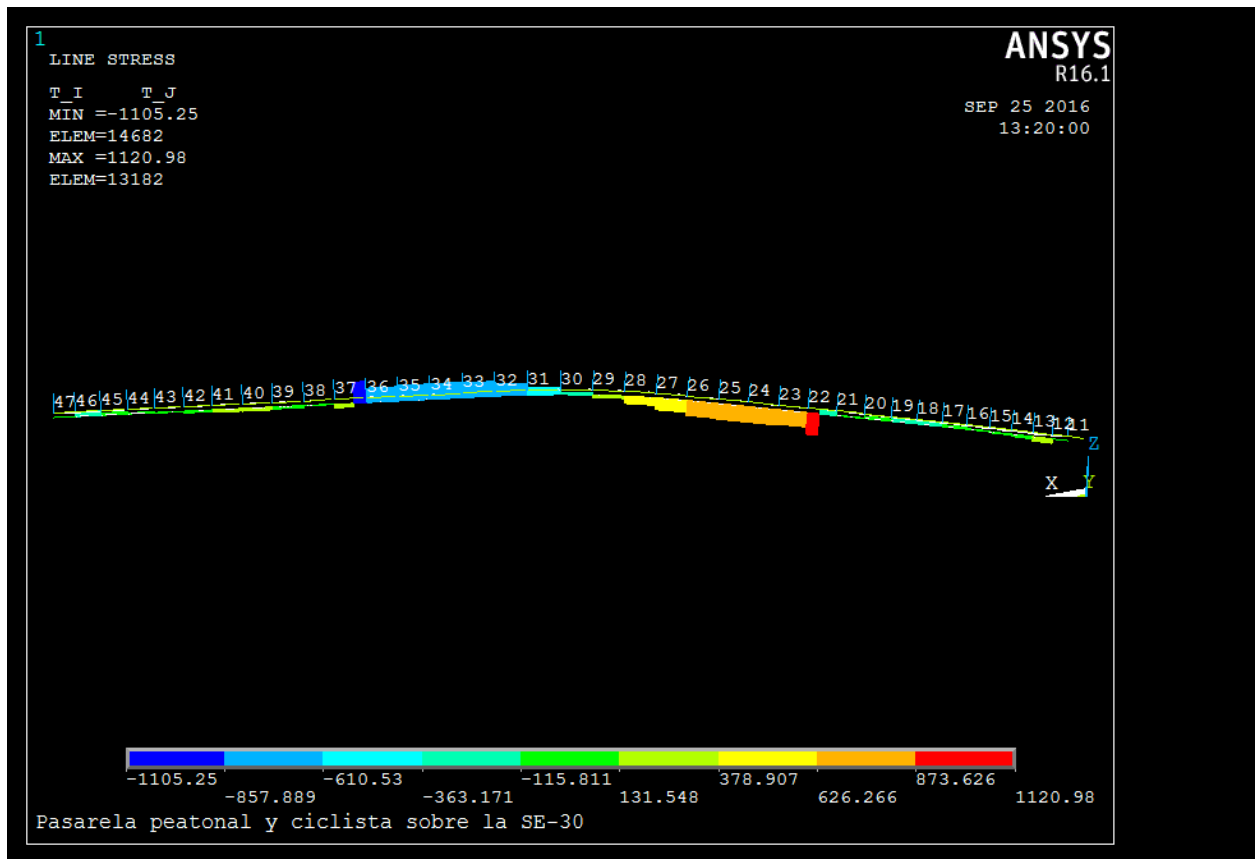
Máximo momento Y positivo y negativo



Máximo momento Z positivo



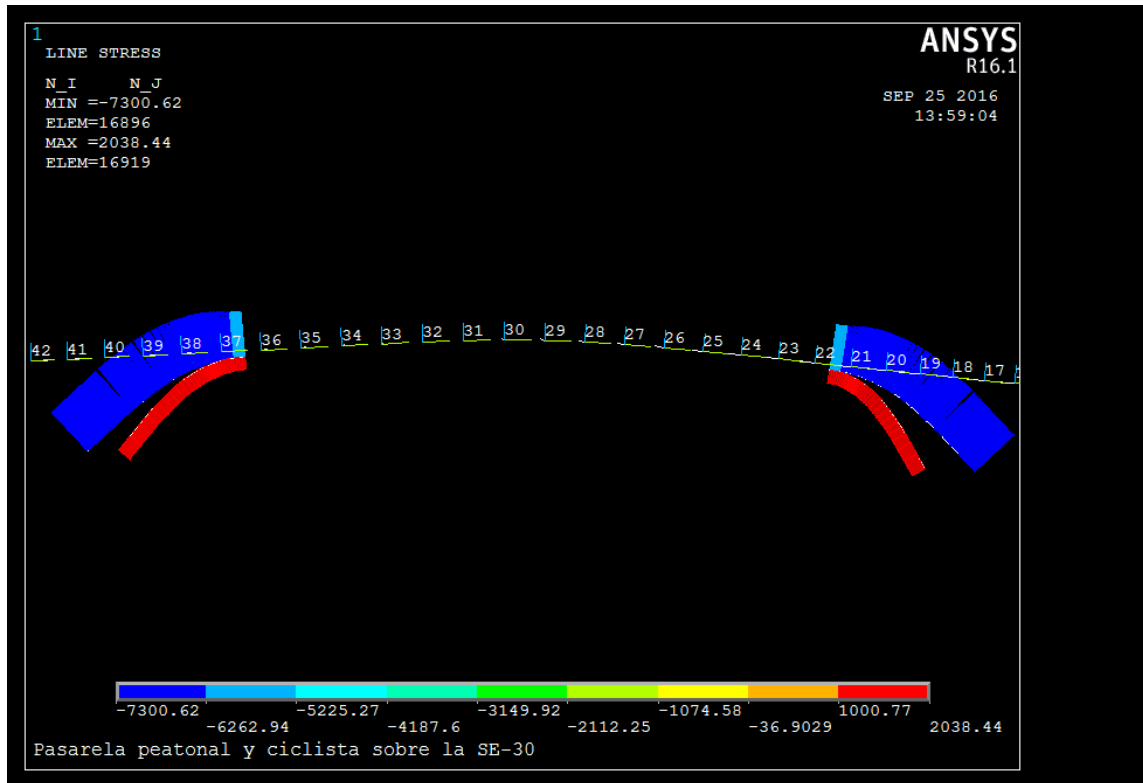
Máximo momento Z negativo



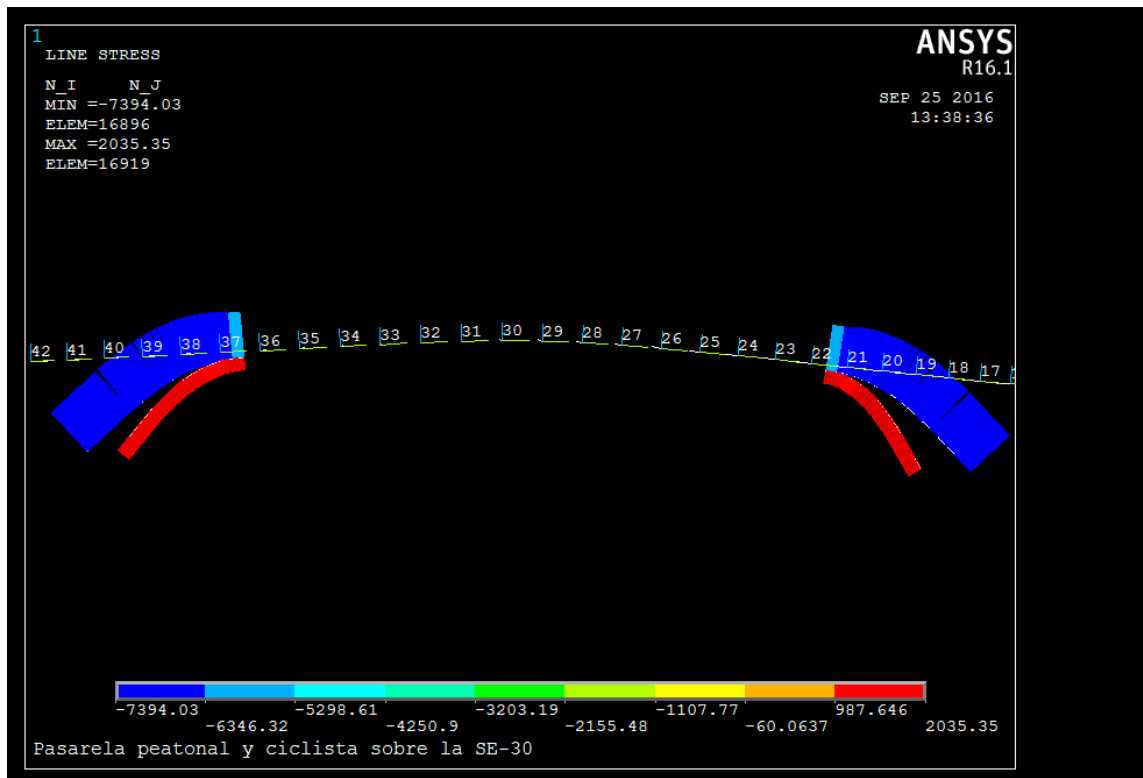
Máximo torsor positivo y negativo

1.2.2 Estribos

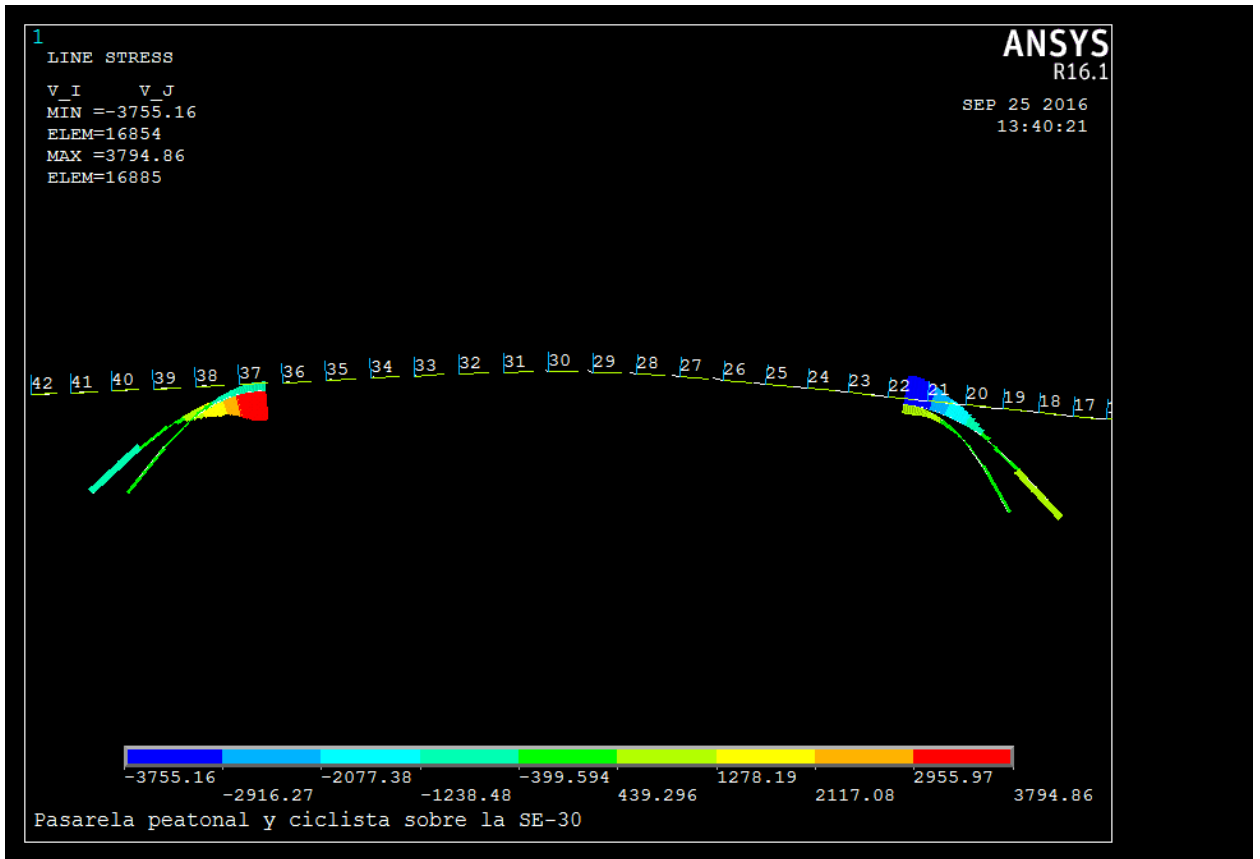
1.2.2.1 ELU



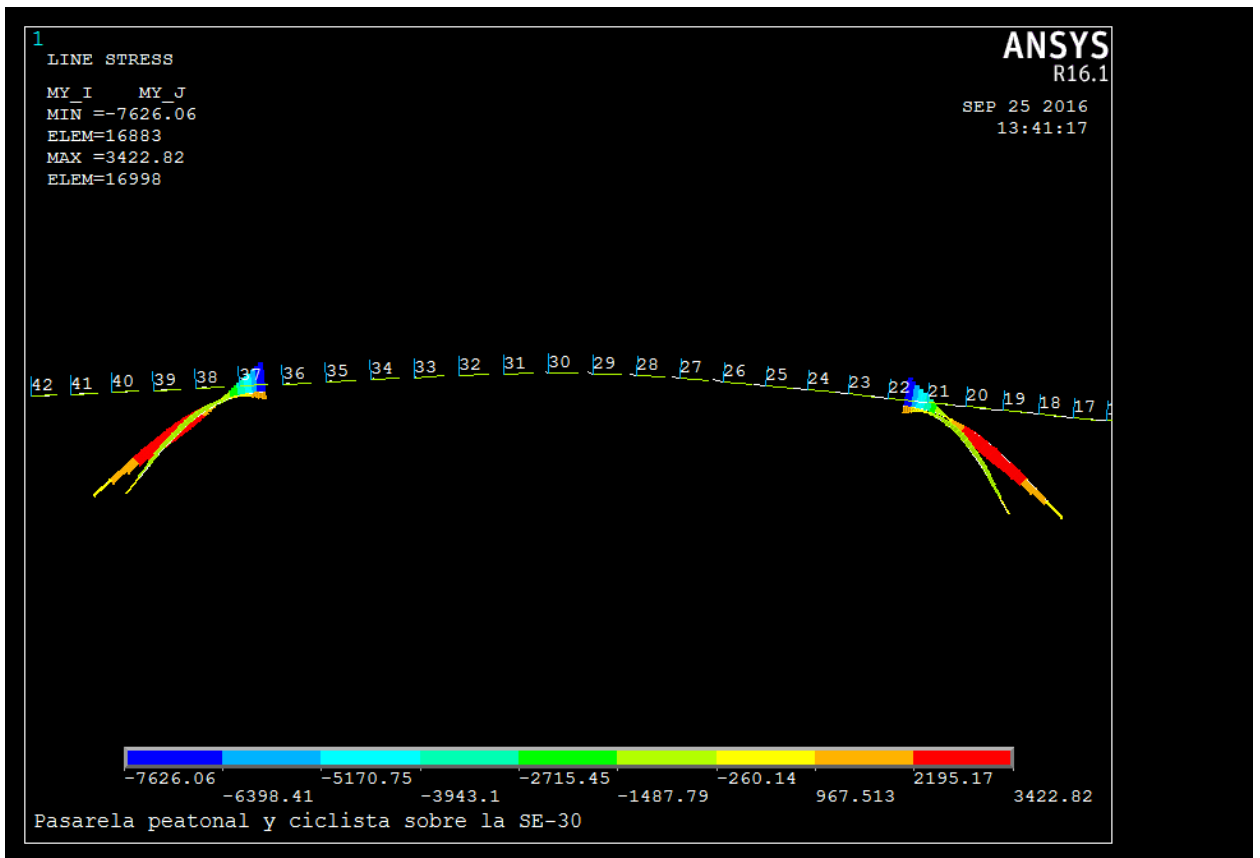
Máximo axil positivo



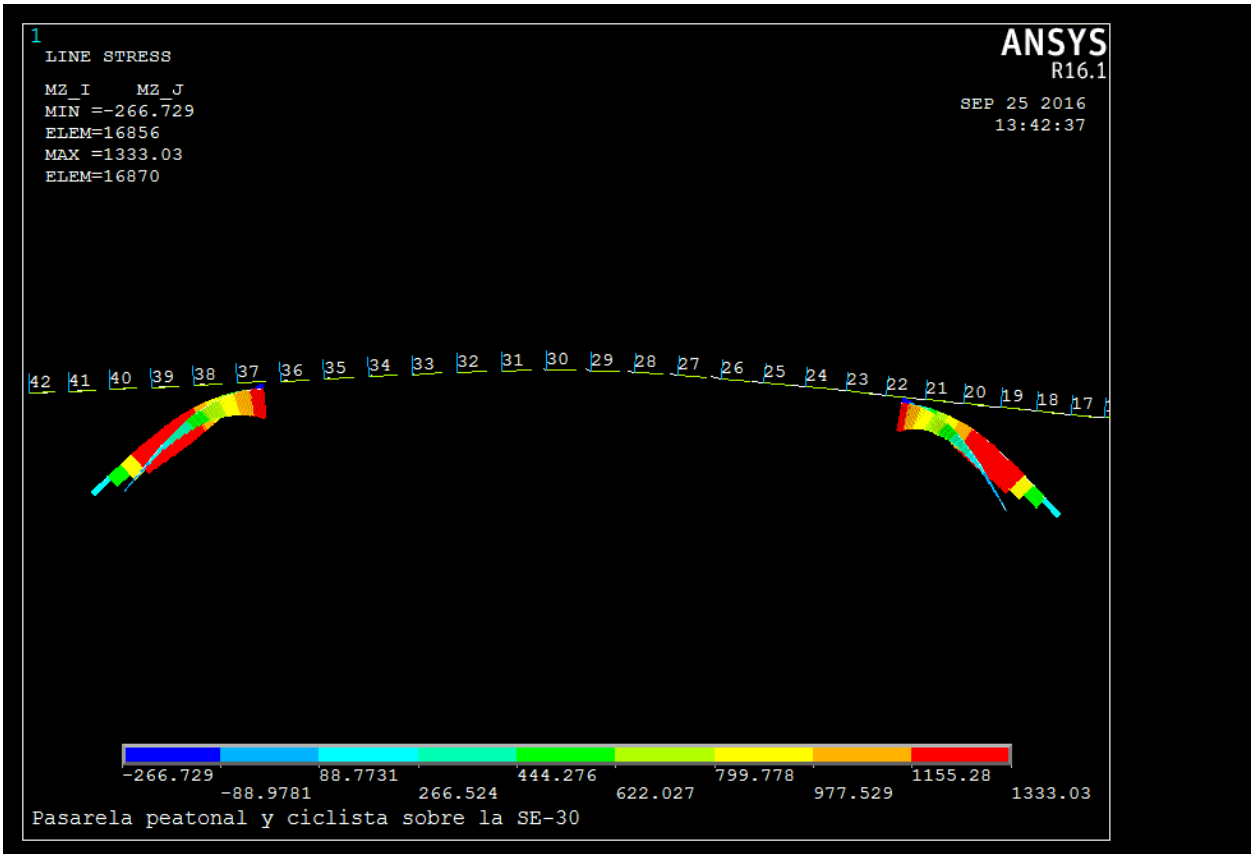
Máximo axil negativo



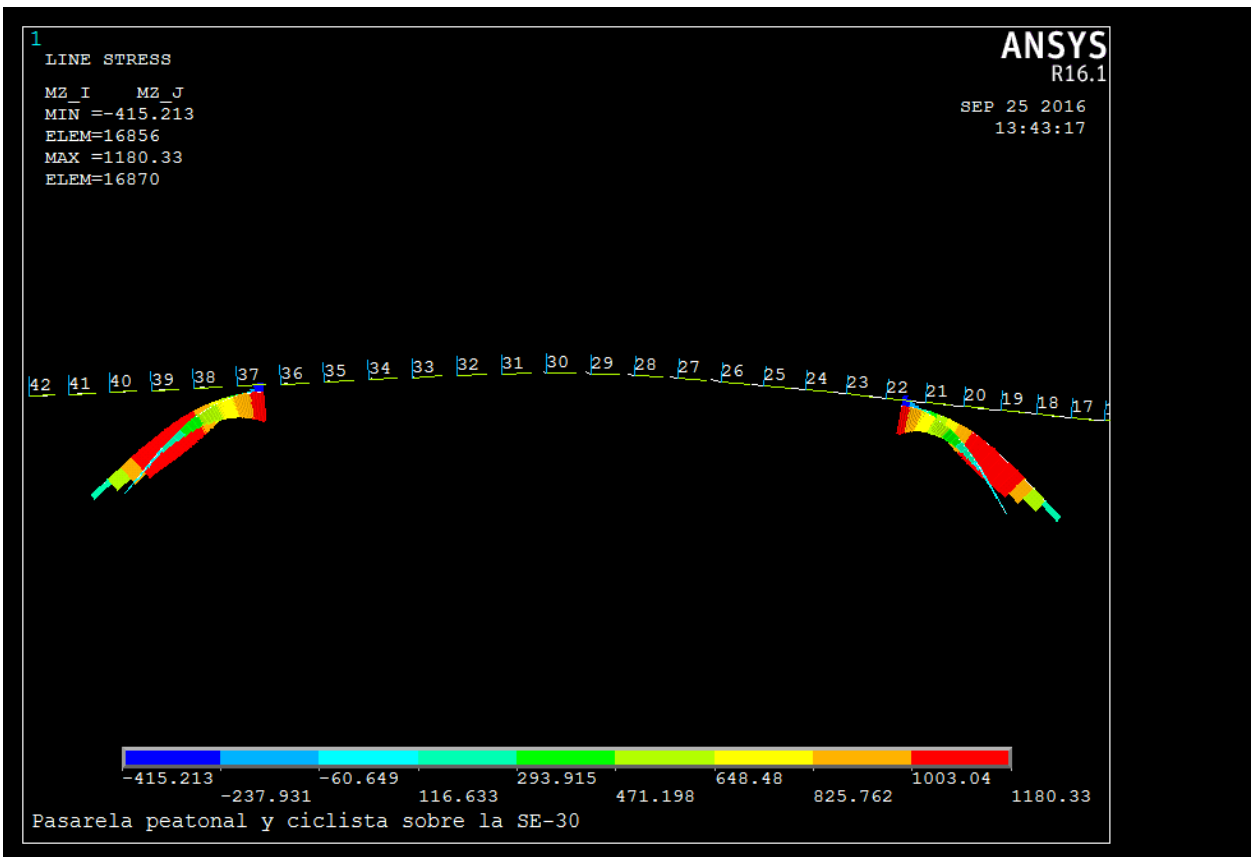
Máximo cortante positivo y negativo



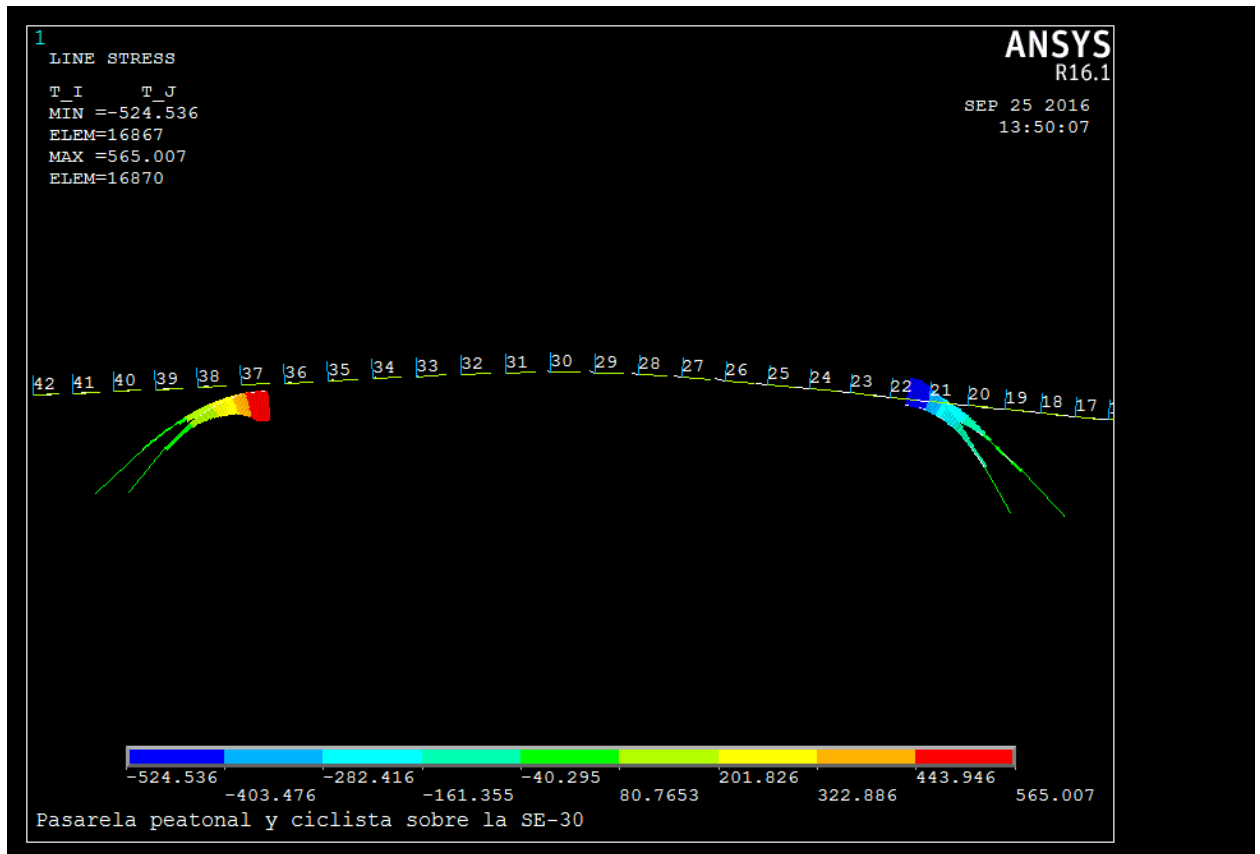
Máximo momento Y positivo y negativo



Máximo momento Z positivo

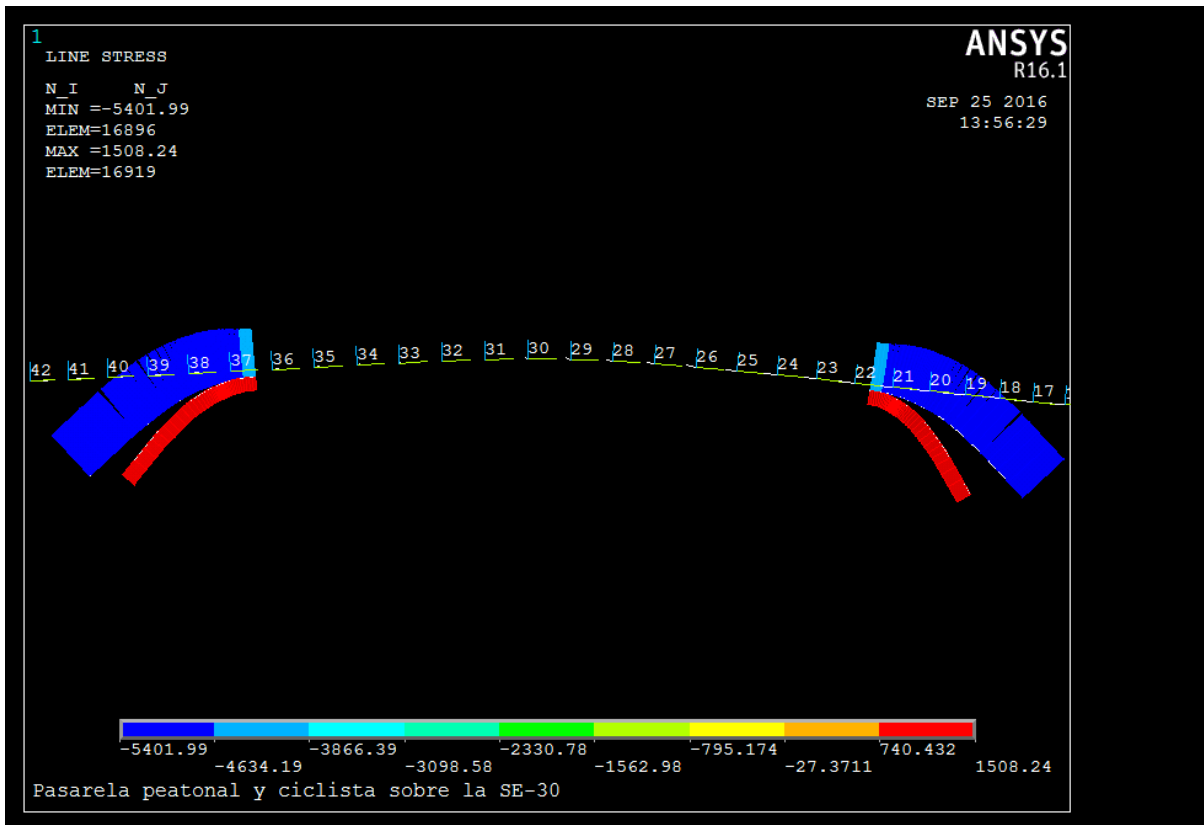


Máximo momento Z negativo

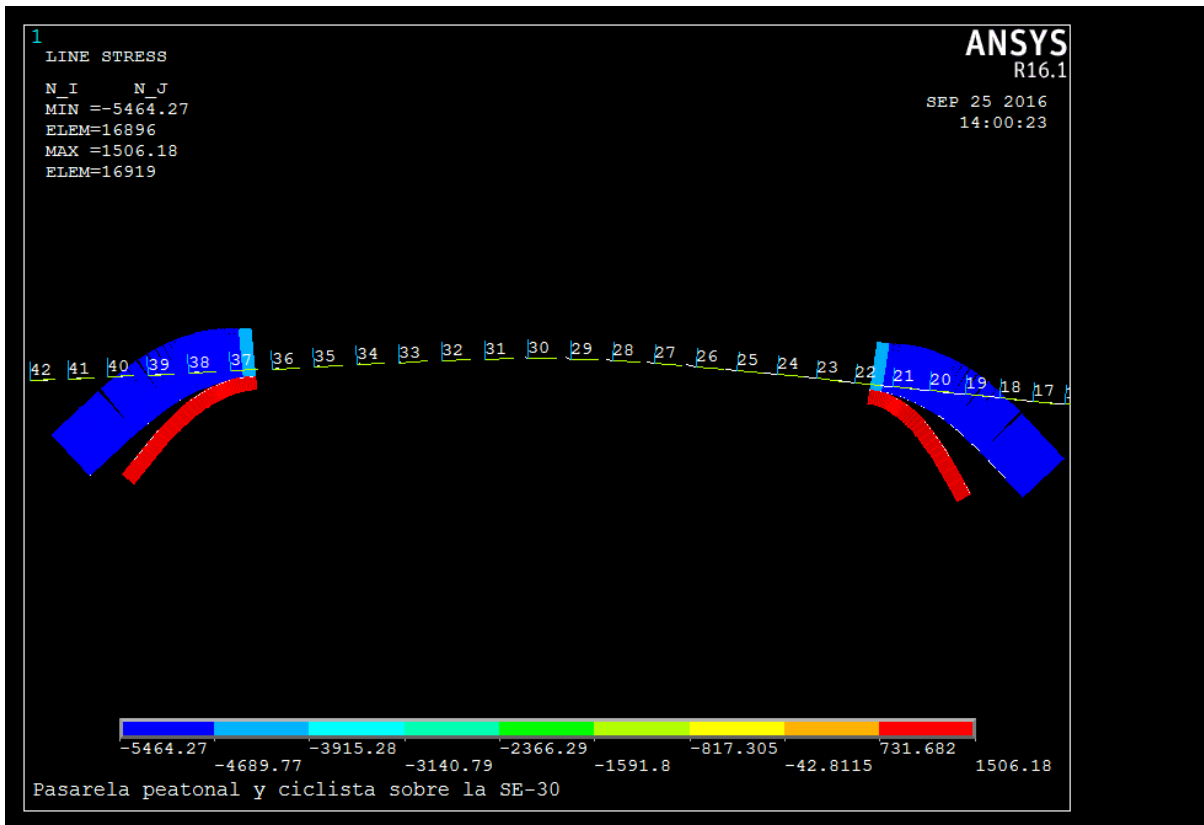


Máximo torsor positivo y negativo

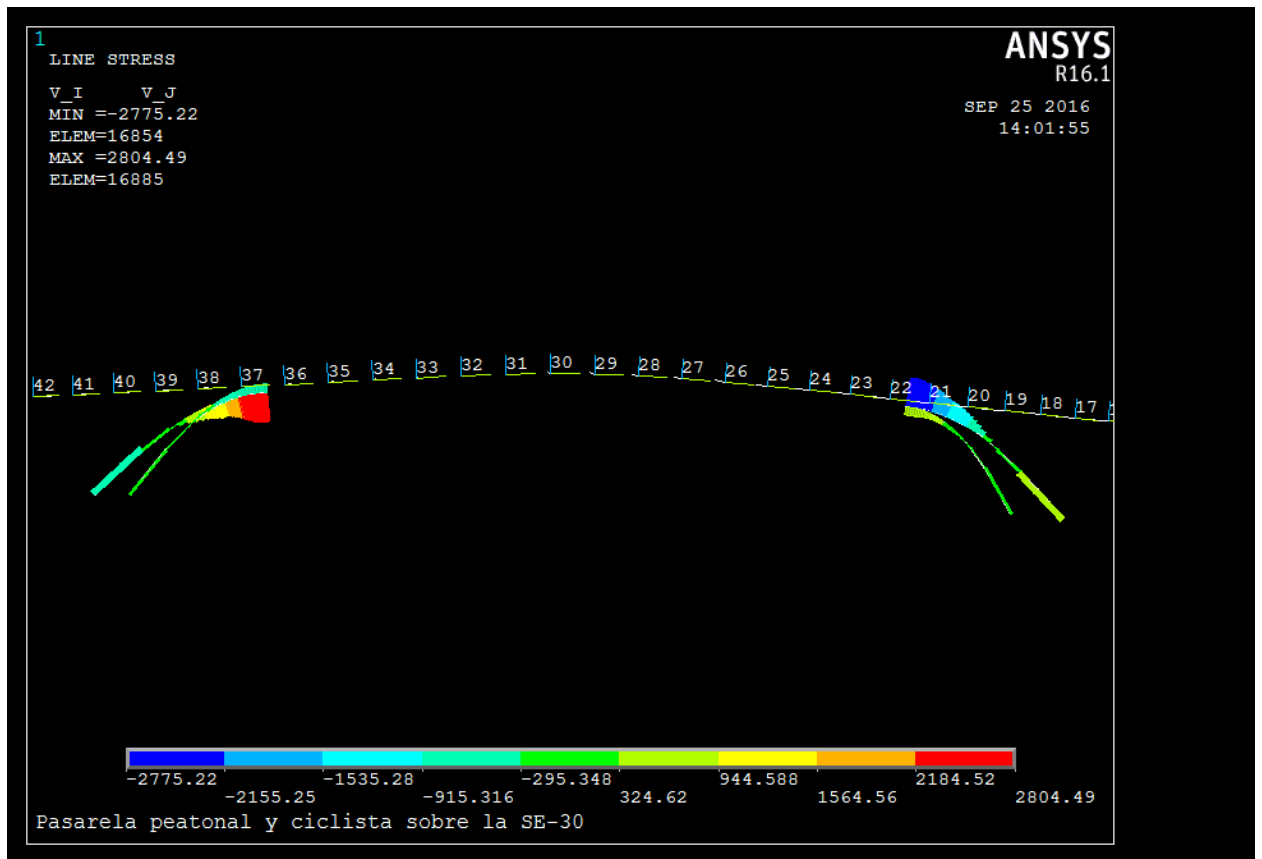
1.2.2.2 ELS



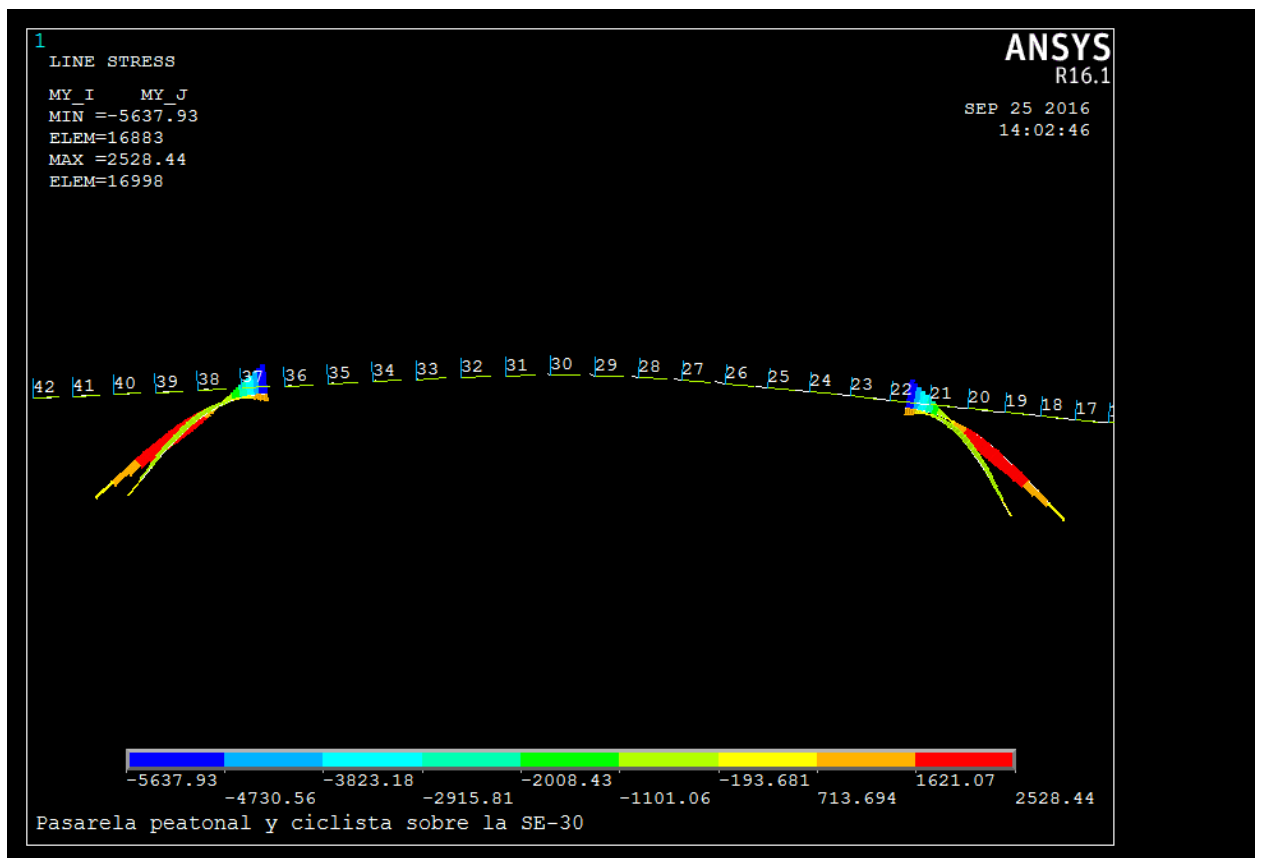
Máximo axil positivo



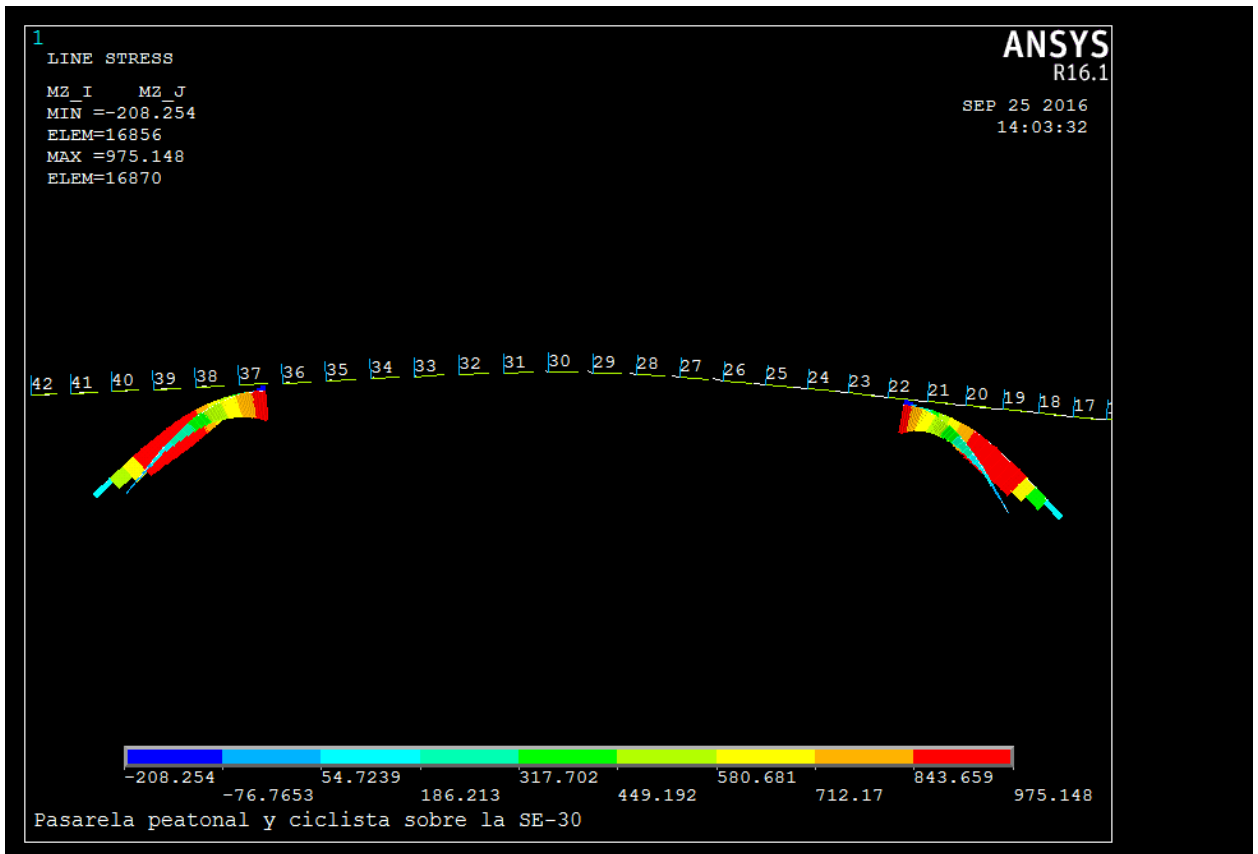
Máximo axil negativo



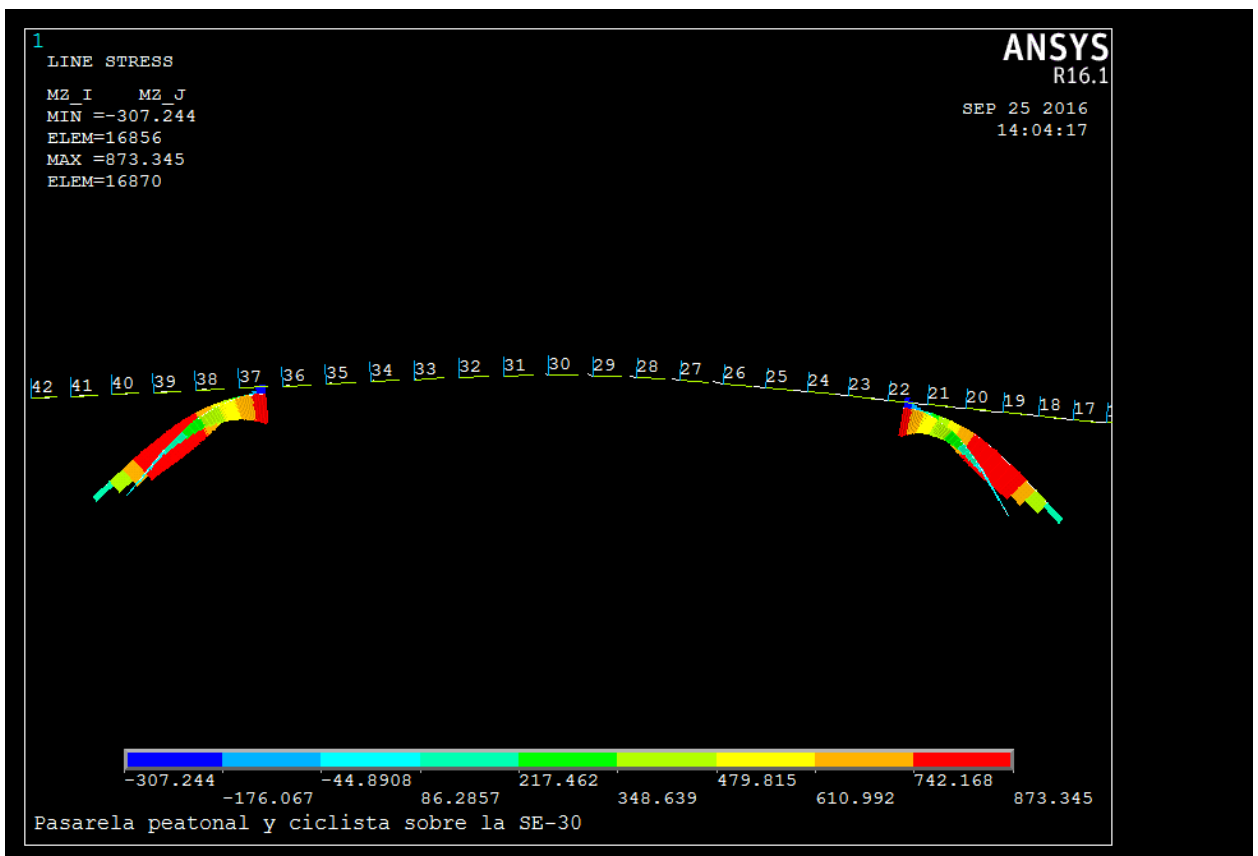
Máximo cortante positivo y negativo



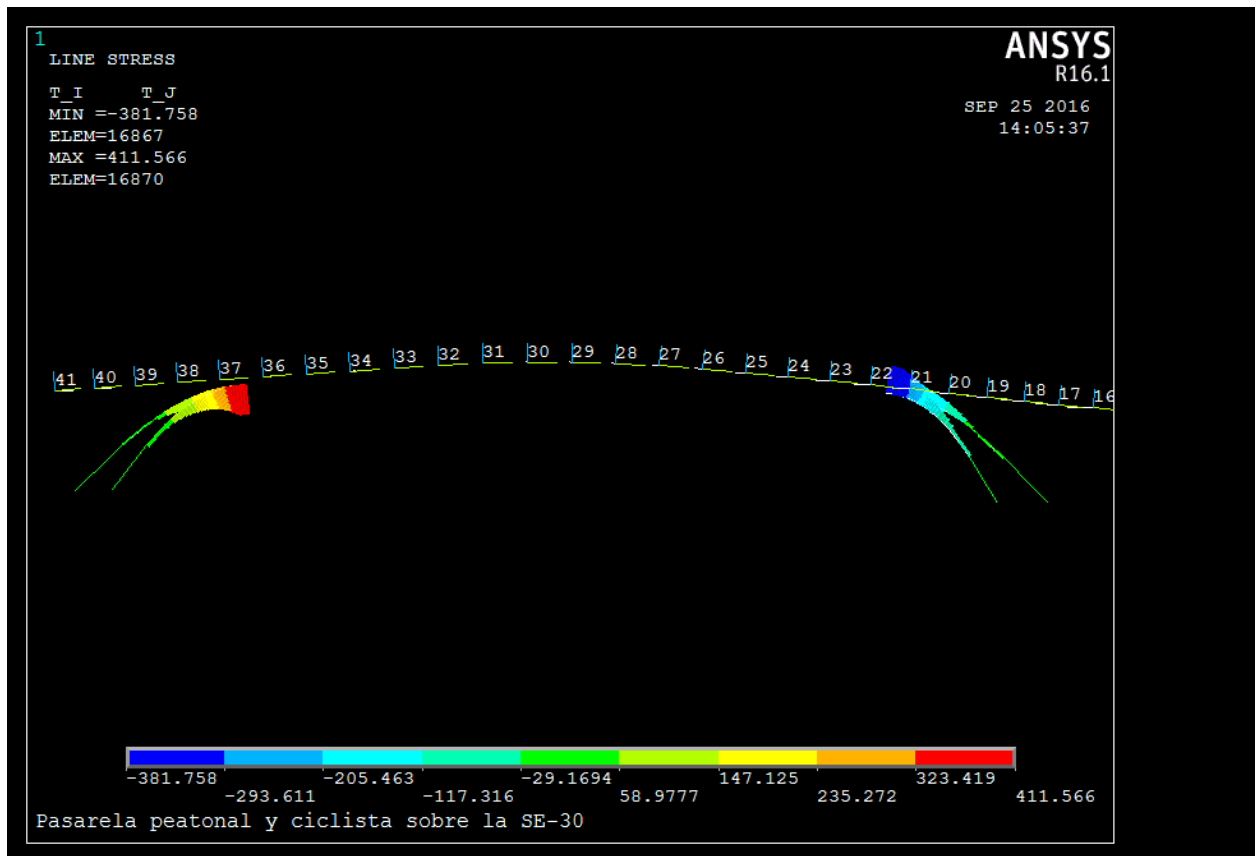
Máximo momento Y positivo y negativo



Máximo momento Z positivo

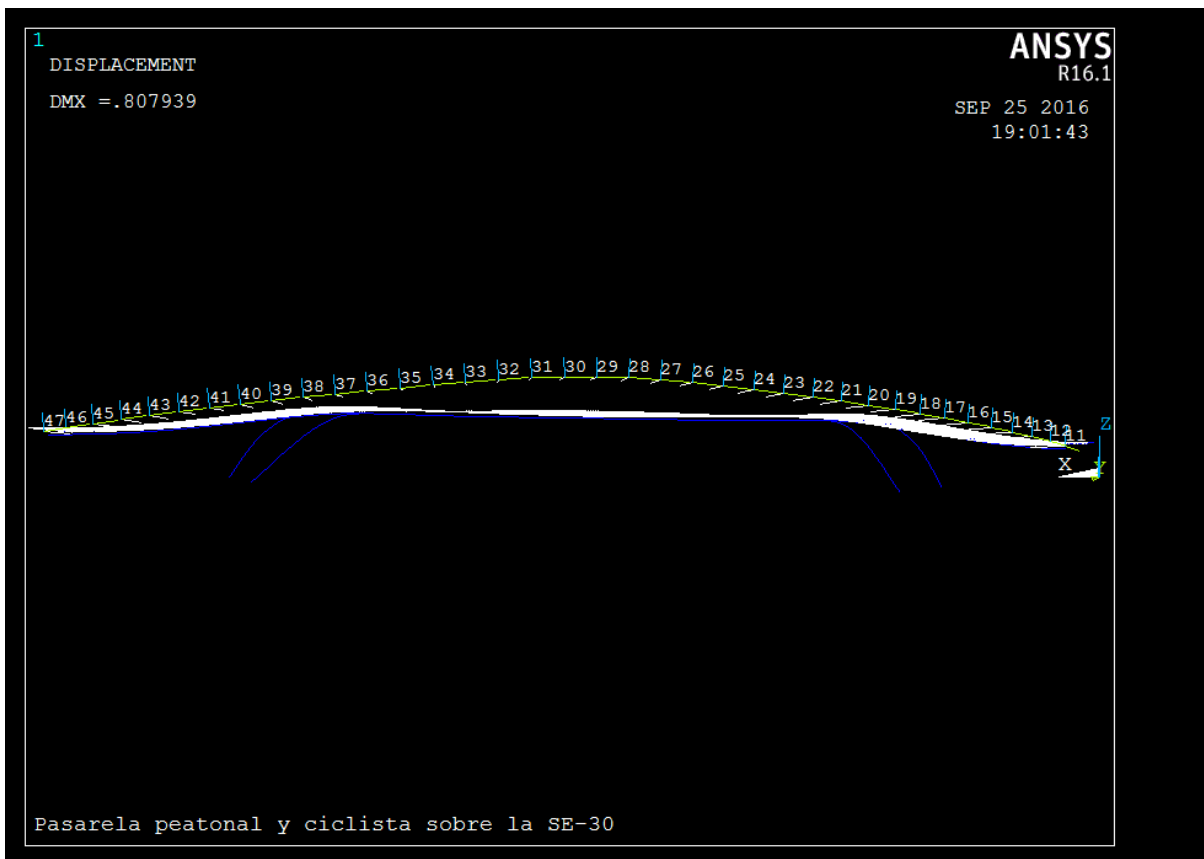


Máximo momento Z negativo

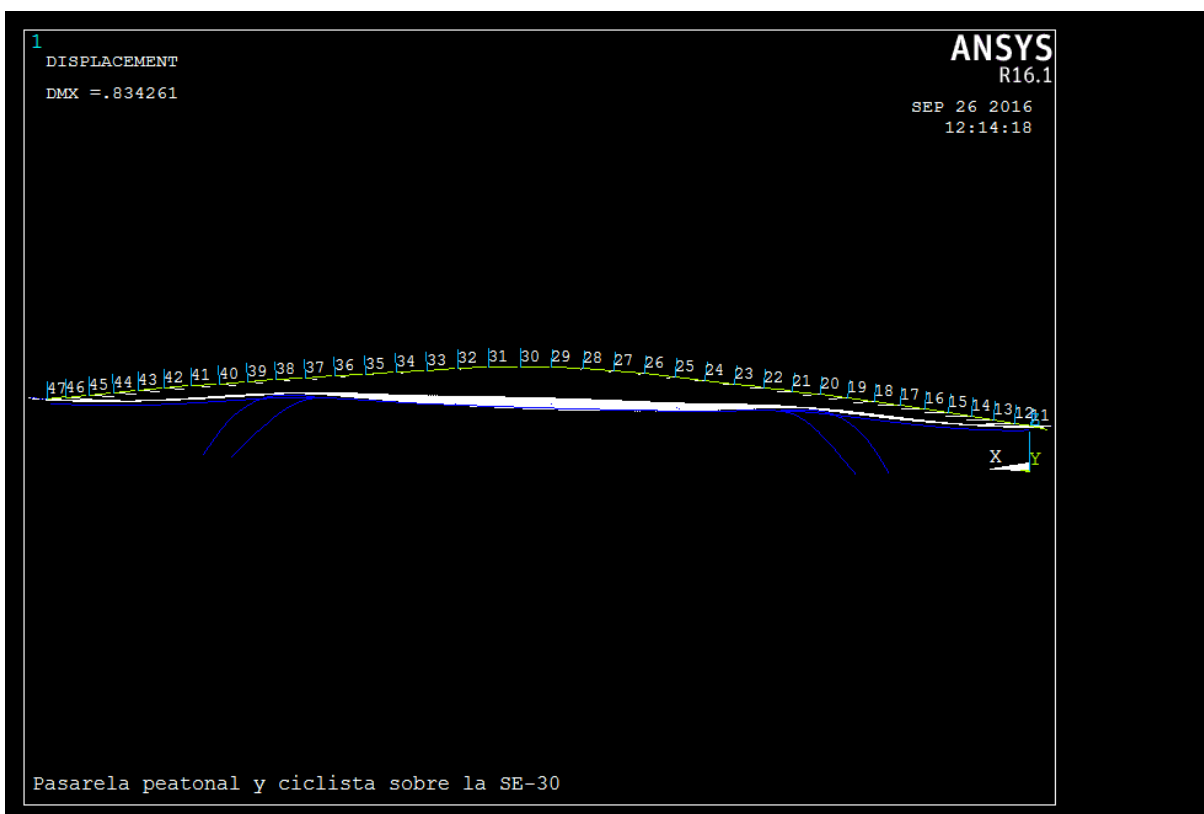


Máximo torsor positivo y negativo

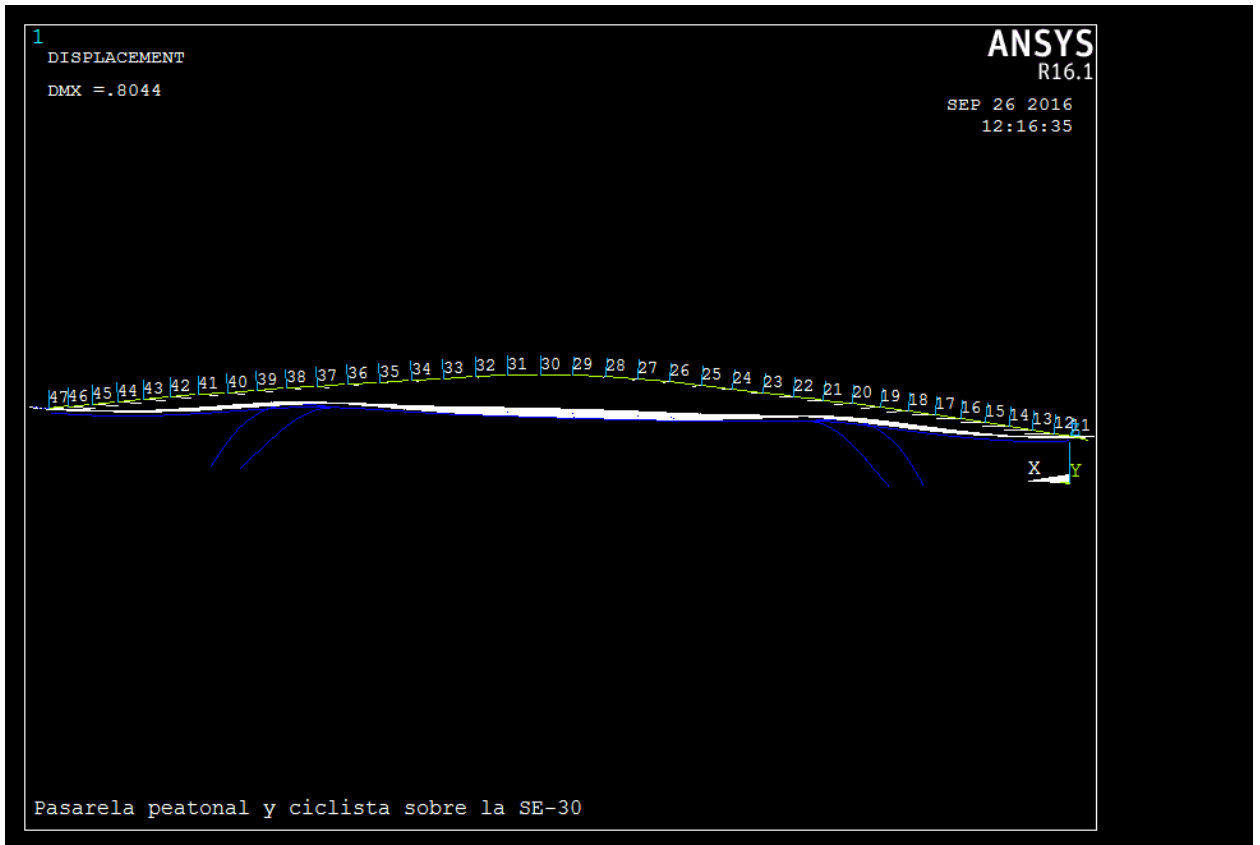
1.3 Deformadas



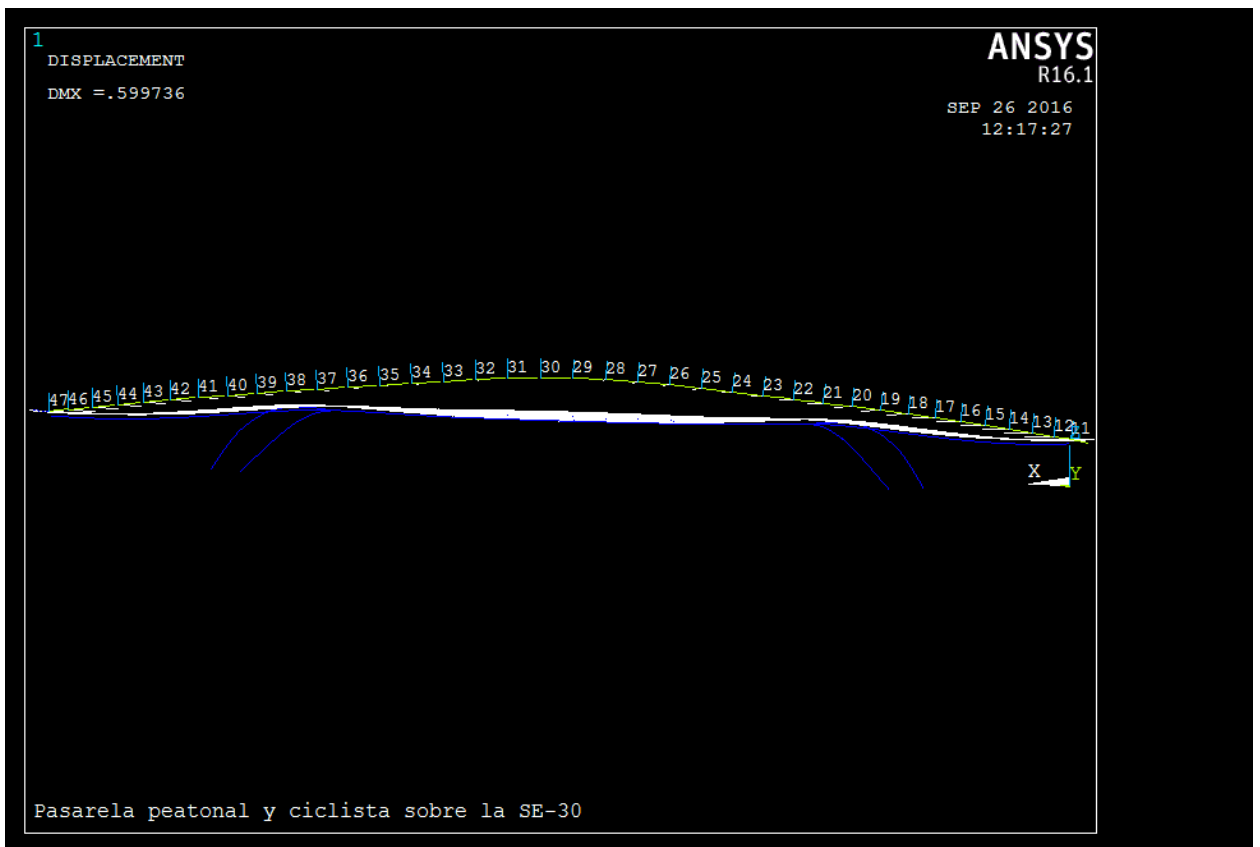
Deformada combinación 11



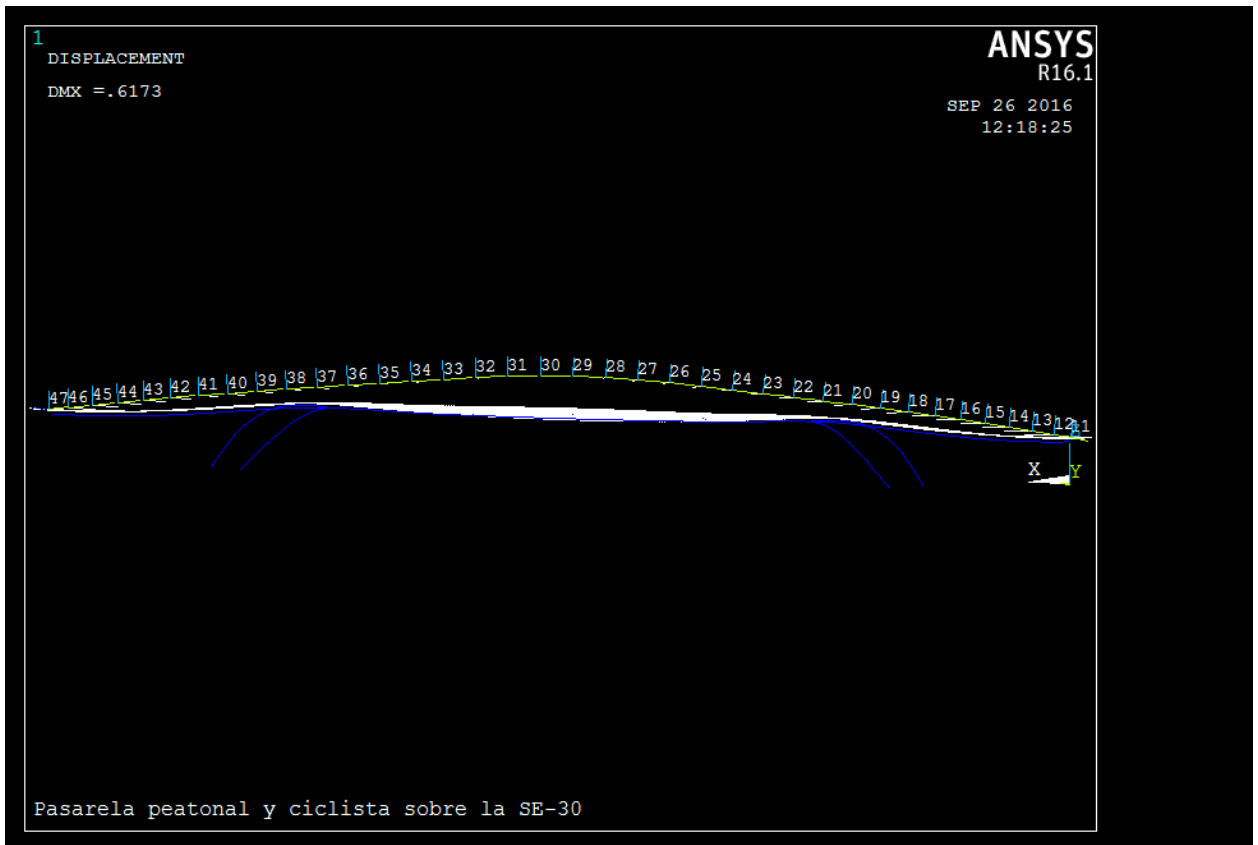
Deformada combinación 22



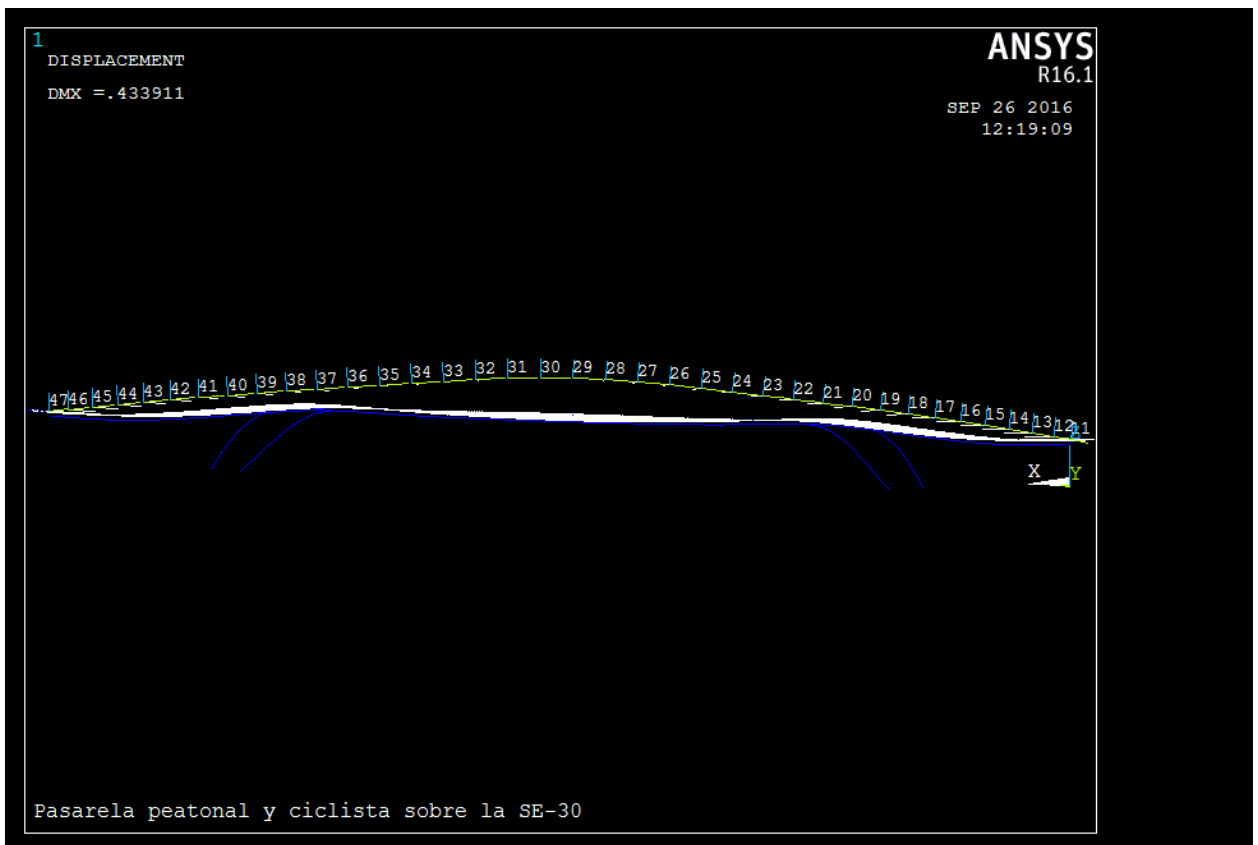
Deformada combinación 26



Deformada combinación 32

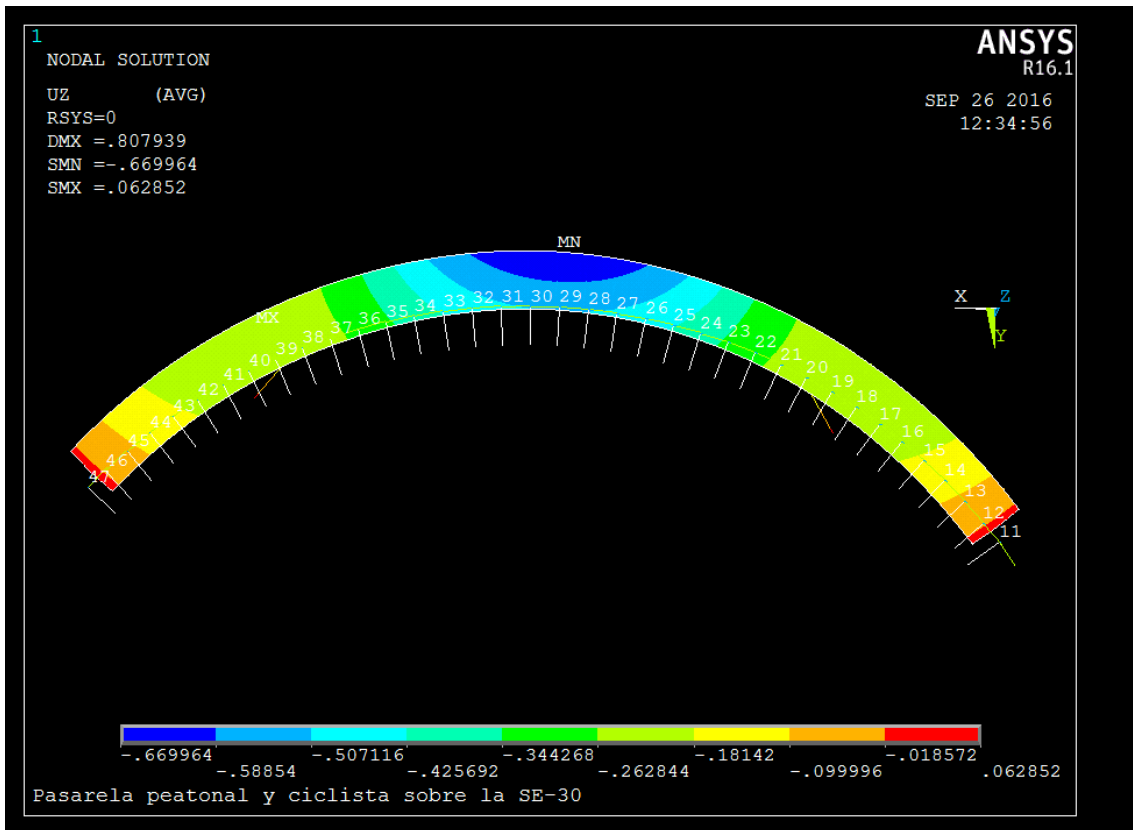


Deformada combinación 43

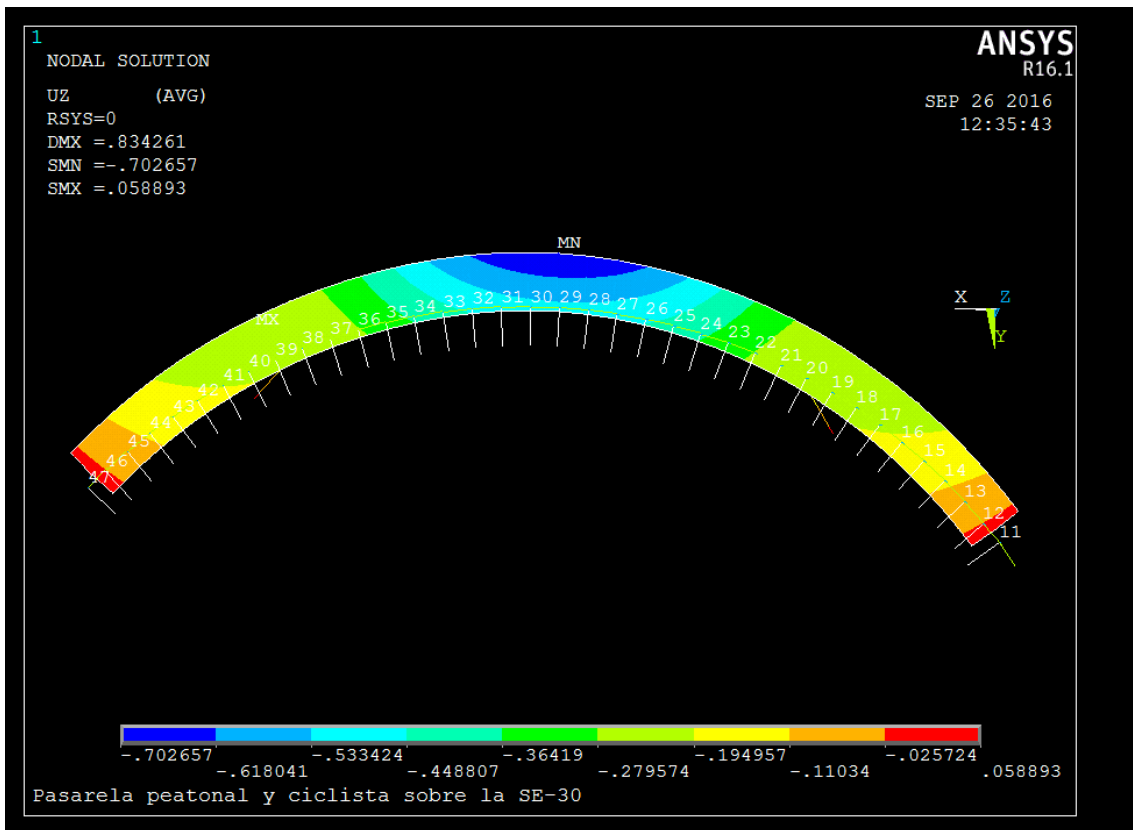


Deformada combinación 46

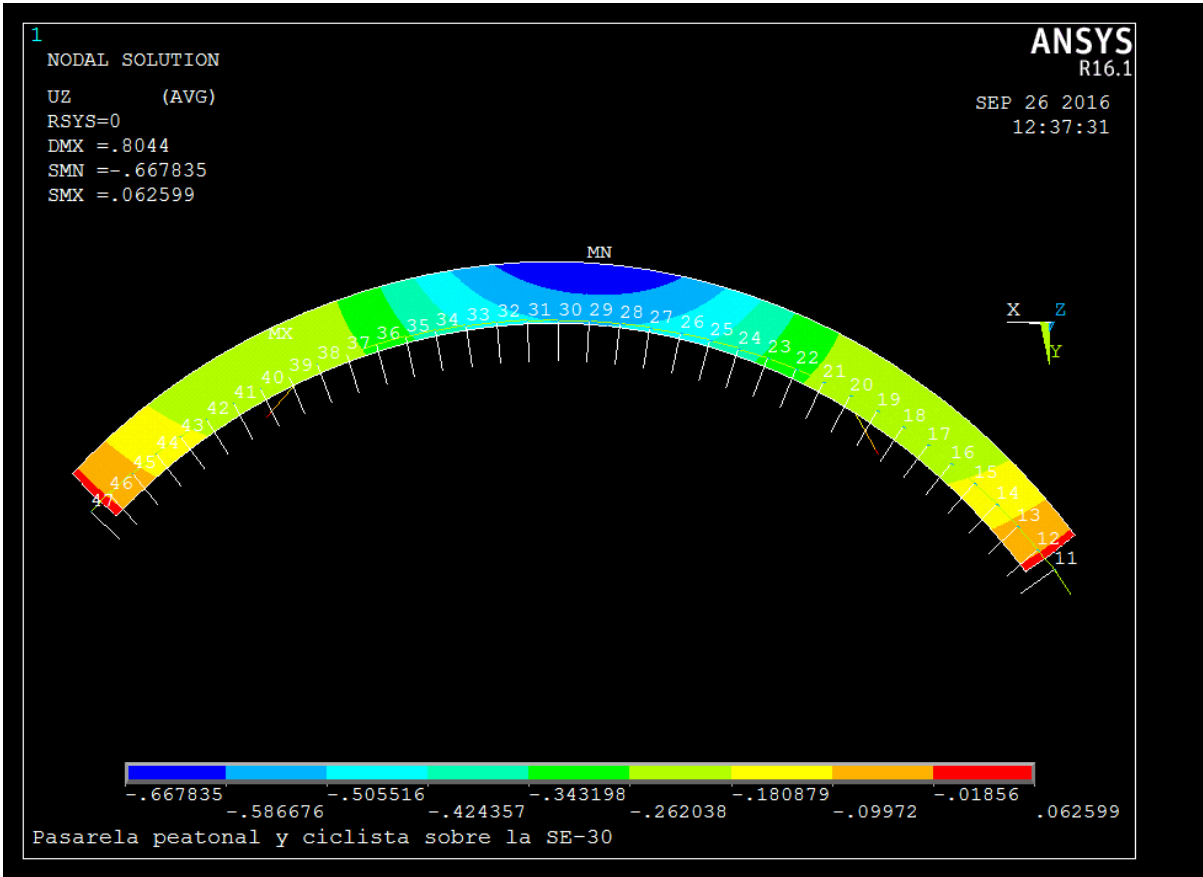
1.4 Mapas de desplazamientos



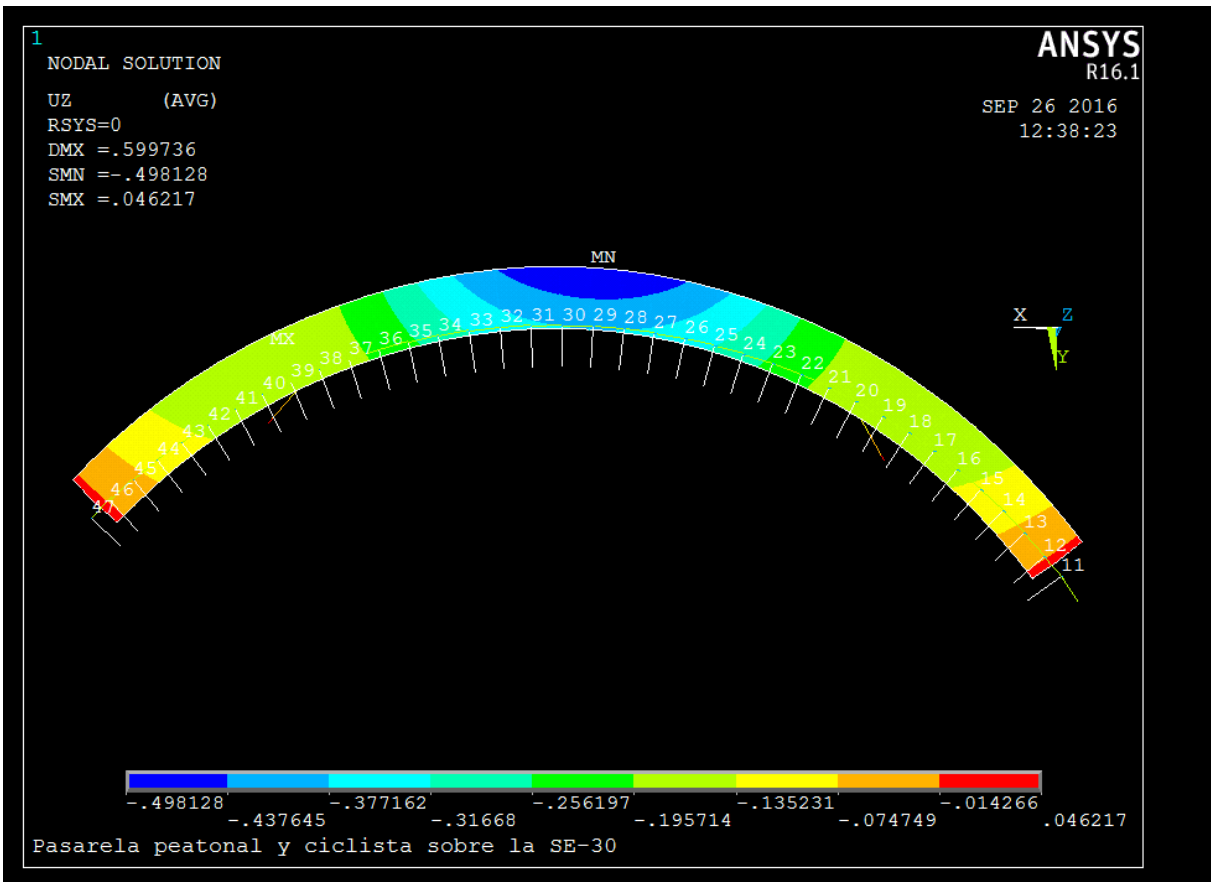
Mapa de desplazamientos 11



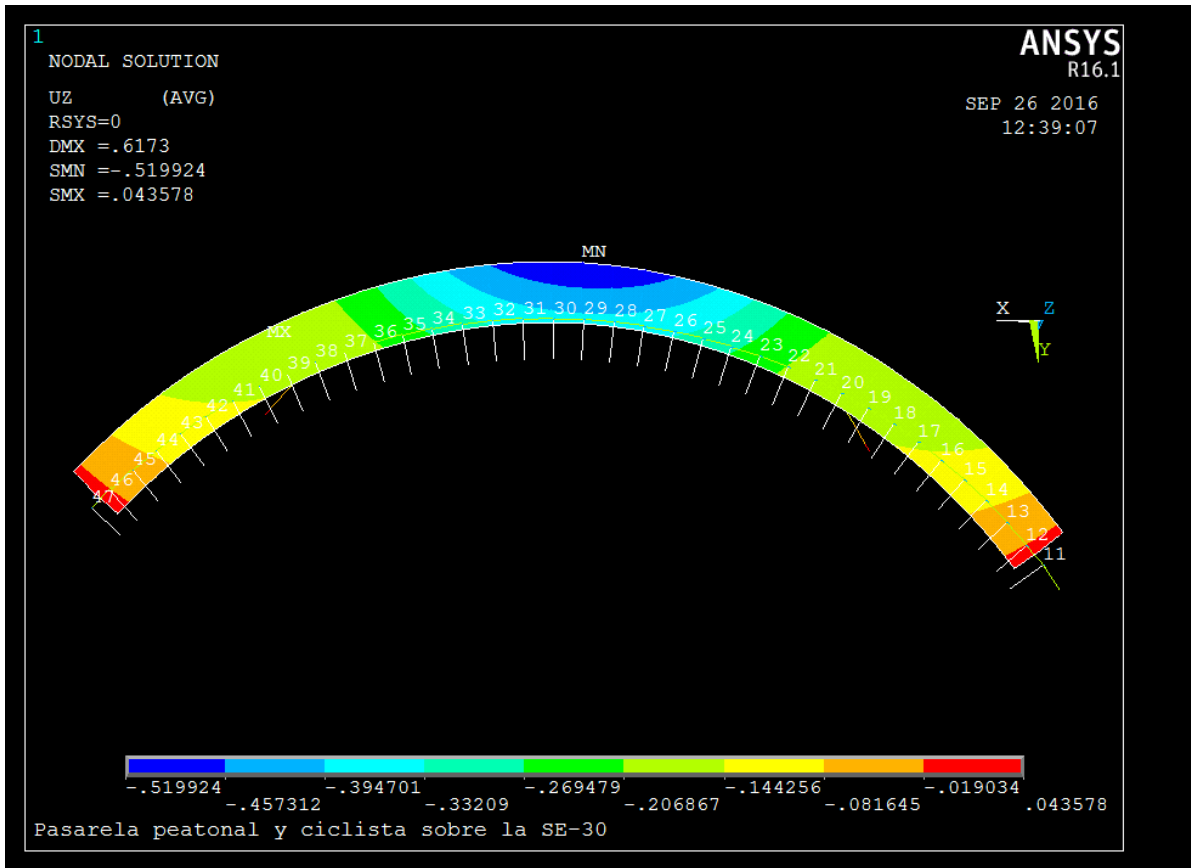
Mapa de desplazamientos 22



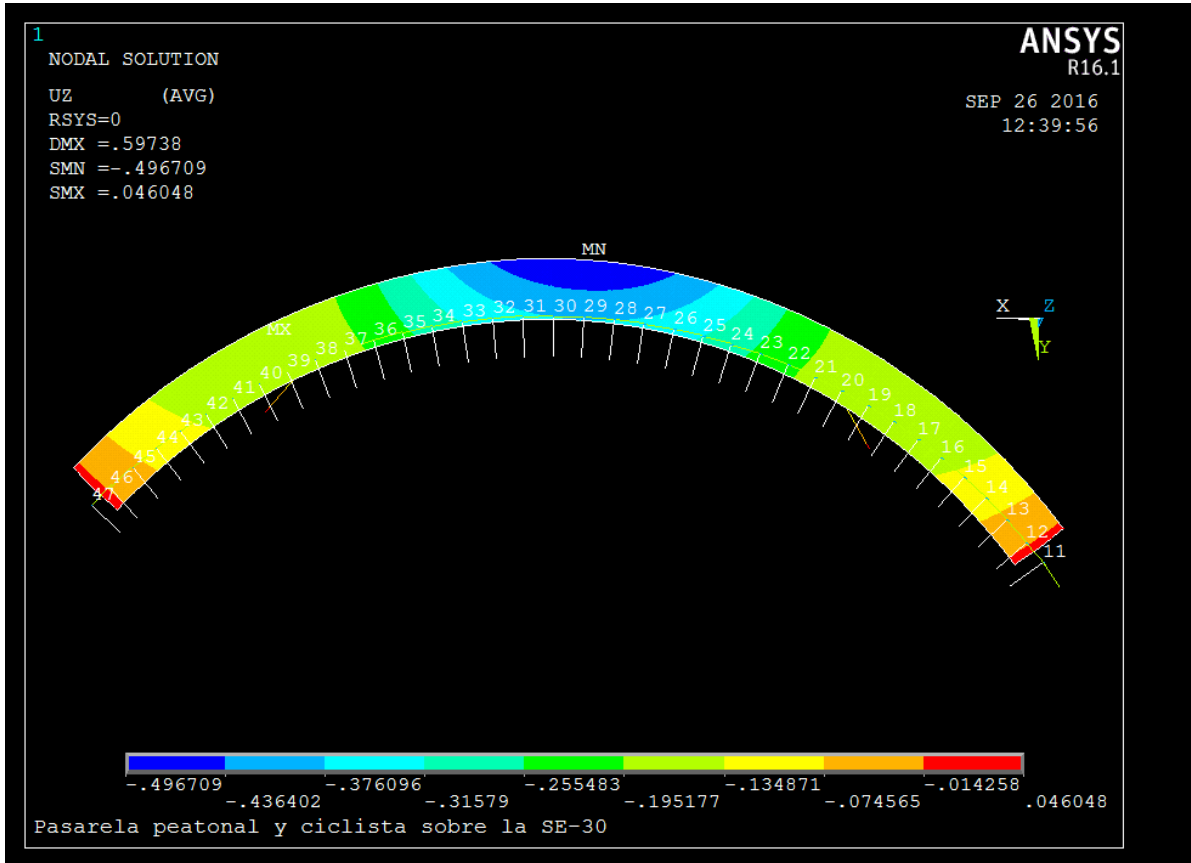
Mapa de desplazamientos 26



Mapa de desplazamientos 32



Mapa de desplazamientos 43



Mapa de desplazamientos 47

Los valores en amarillo son los máximos de cada Keypoint para todas las combinaciones que se han considerado más desfavorables, y quedan resumidos en lo siguiente:

FY			
KP	COMBINACIÓN	MAX +	MAX -
41	11	-	-1381.1
40	11	1213.9	-
55	11	1082.0	-
54	22	-	-754.12

FX			
KP	COMBINACIÓN	MAX +	MAX -
41	11	5659.9	-
40	22	-	-1064.4
55	22	1169.9	-
54	11	-	-5759.1

FZ			
KP	COMBINACIÓN	MAX +	MAX -
41	11	4565.1	-
40	22	-	-1253.7
55	22	-	-1246.1
54	11	4568.2	-
56	22	287.53	-
57	22	108.85	-
128	22	275.14	-
129	22	94.494	-
130	22	565.86	-
166	22	567.60	-
1	22	-	-188.98
39	22	-	-167.96

Los valores más desfavorables viendo cuales son los máximos, serían una combinación de entre todas las posibilidades de carga, entrelazando los vistos en las tablas expuestas justo en la página anterior. Tenemos una tabla resumen:

RESULTADOS			
KP	FY	FX	FZ
41	-1381.1	5659.9	4565.1
40	1213.9	-1064.4	-1253.7
55	1082.0	1169.9	-1246.1
54	-754.12	-5759.1	4568.2
56	-	-	287.53
57	-	-	108.85
128	-	-	275.14
129	-	-	94.494
130	-	-	565.86
166	-	-	567.60
1	-	-	-188.98
39	-	-	-167.96

Los valores de los esfuerzos y las reacciones, así como de los desplazamientos vistos están en las unidades del SI, en este caso estamos trabajando con kN y m.

Anejo II. Resultados del tubo de sección de \varnothing 1067 mm

Ahora vemos los resultados del tubo de diámetro 1067 mm. Se hizo necesario aumentar la sección porque con el anterior tubo de diámetro 711 mm se producían unas deformaciones demasiado grandes para ser admitidas en los Estados Límite de Servicio.

1.1 Resultados de los esfuerzos

TUBO					
ELU					
11					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12367.	-1670.1	-2269.3	-965.55	-1217.5
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1593.6	1689.0	7277.3	1123.4	1226.9
12					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10344.	-1318.5	-1883.6	-878.76	-834.03
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	865.95	1335.1	5734.9	874.39	842.04

13					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-12282.	-1342.0	-2206.2	-1069.8	-691.83
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-31.458	1362.7	5787.6	985.39	694.26

14					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-12168.	-1323.4	-2185.4	-1041.5	-678.68
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-30.208	1343.2	5699.8	971.17	682.48

15					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12161.	-1634.5	-2230.3	-932.74	-1178.5
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1520.9	1653.0	7118.3	1100.6	1187.5

16					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10344.	-1318.5	-1883.6	-878.76	-834.03
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	865.95	1335.1	5734.9	874.39	842.04

17					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12253.	-1651.5	-2248.5	-937.25	-1197.2
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1555.4	1669.5	7189.5	1112.6	1206.0

18					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10216.	-1300.2	-1862.7	-799.44	-812.30
MAXIMUM VALUES					
ELEM	12481	13181	14782	13682	13182
VALUE	830.12	1314.3	5637.8	868.42	818.28

19					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-12168.	-1323.4	-2185.4	-1041.5	-678.68
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-30.208	1343.2	5699.8	971.17	682.48

20					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10344.	-1318.5	-1883.6	-878.76	-834.03
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	865.95	1335.1	5734.9	874.39	842.04

21					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12161.	-1634.5	-2230.3	-932.74	-1178.5
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1520.9	1653.0	7118.3	1100.6	1187.5

22					
MINIMUM VALUES					
ELEM	14781	14782	12381	13182	14682
VALUE	-9343.7	-1615.4	-1808.5	-615.18	-1775.5
MAXIMUM VALUES					
ELEM	12481	13181	13181	13582	13182
VALUE	3347.2	1627.4	7101.9	1157.0	1784.0

23					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12259.	-1651.3	-2248.6	-959.12	-1197.9
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1554.4	1670.1	7194.6	1110.6	1207.2

24					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10236.	-1299.7	-1862.9	-872.33	-814.46
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	826.72	1316.1	5652.2	861.52	822.38

25					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-12174.	-1323.2	-2185.5	-1063.3	-678.18
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-30.888	1343.7	5705.0	981.29	680.59

26					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12365.	-1670.0	-2269.3	-945.59	-1216.3
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1594.6	1688.8	7274.3	1125.0	1225.6

27					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-10591.	-1362.0	-1931.8	-827.22	-875.92
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	960.80	1378.4	5917.7	909.77	883.58

28					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-12280.	-1341.9	-2206.2	-1049.8	-692.81
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-30.873	1362.4	5784.6	976.34	695.50

29					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-12076.	-1306.4	-2167.2	-1037.0	-666.91
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-29.799	1326.6	5628.6	968.38	669.55

30					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-12259.	-1651.3	-2248.6	-959.12	-1197.9
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1554.4	1670.1	7194.6	1110.6	1207.2

31					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-12174.	-1323.2	-2185.5	-1063.3	-678.18
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-30.888	1343.7	5705.0	981.29	680.59

ELS					
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32					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8929.8	-1231.8	-1642.2	-686.39	-941.81
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1307.8	1245.3	5372.2	832.17	948.69

33					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-7430.8	-971.36	-1356.5	-618.65	-657.59
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	768.96	983.10	4229.1	647.97	663.42

34					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-8722.9	-987.05	-1571.6	-745.99	-529.53
MAXIMUM VALUES					
ELEM	12381	13181	13181	14682	13582
VALUE	-7.0400	1001.5	4264.3	677.10	531.25

35					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-7345.2	-959.18	-1342.6	-565.78	-643.10
MAXIMUM VALUES					
ELEM	12481	13181	14782	13682	13182
VALUE	745.08	969.22	4164.1	643.99	647.58

36					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8792.4	-1208.1	-1616.2	-664.52	-915.83
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1259.3	1221.3	5266.1	816.96	922.48

37					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-7358.5	-958.81	-1342.8	-614.36	-644.54
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	742.81	970.45	4174.0	639.39	650.31

38					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8853.5	-1219.4	-1628.4	-667.53	-928.33
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1282.3	1232.3	5313.6	824.97	934.76

39					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-7345.2	-959.18	-1342.6	-565.78	-643.10
MAXIMUM VALUES					
ELEM	12481	13181	14782	13682	13182
VALUE	745.08	969.22	4164.1	643.99	647.58

40					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-8646.6	-974.61	-1557.8	-727.13	-520.76
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-22.864	988.49	4205.7	667.62	523.40

41					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-7596.7	-1000.4	-1388.7	-597.60	-686.27
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	831.53	1012.2	4353.0	670.48	691.98

42					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8792.4	-1208.1	-1616.2	-664.52	-915.83
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1259.3	1221.3	5266.1	816.96	922.48

43					
MINIMUM VALUES					
ELEM	14781	14782	12381	13182	14682
VALUE	-6914.1	-1195.4	-1338.2	-455.24	-1313.8
MAXIMUM VALUES					
ELEM	12481	13181	13181	13582	13182
VALUE	2476.9	1204.2	5255.2	856.18	1320.1

44					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8857.5	-1219.3	-1628.4	-682.11	-928.76
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1281.6	1232.7	5317.1	823.59	935.58

45					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-7358.5	-958.81	-1342.8	-614.36	-644.54
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	742.81	970.45	4174.0	639.39	650.31

46					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-8650.6	-974.50	-1557.8	-741.71	-520.43
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-23.316	988.86	4209.2	674.37	522.14

47					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-8928.6	-1231.8	-1642.2	-673.08	-941.06
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	1308.5	1245.1	5370.2	833.24	947.82

48					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-7595.6	-1000.4	-1388.7	-584.29	-685.52
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	832.19	1012.0	4351.0	671.56	691.11

49					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-8721.7	-986.97	-1571.6	-732.68	-530.19
MAXIMUM VALUES					
ELEM	12381	13181	13181	14682	13582
VALUE	-6.5445	1001.3	4262.3	671.06	532.08

50					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-8585.5	-963.29	-1545.6	-724.12	-512.92
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-22.591	977.46	4158.2	665.76	514.78

51					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14682
VALUE	-7430.8	-971.36	-1356.5	-618.65	-657.59
MAXIMUM VALUES					
ELEM	12481	13181	13181	13682	13182
VALUE	768.96	983.10	4229.1	647.97	663.42

52					
MINIMUM VALUES					
ELEM	14781	14782	12482	14782	14282
VALUE	-8650.6	-974.50	-1557.8	-741.71	-520.43
MAXIMUM VALUES					
ELEM	12181	13181	13181	14682	13582
VALUE	-23.316	988.86	4209.2	674.37	522.14

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11					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-8140.7	-3967.5	-6759.1	-381.44	-665.14
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2241.7	4013.8	4526.8	1606.2	703.44

12					
MINIMUM VALUES					
ELEM	16891	16854	16883	16856	16867
VALUE	-6474.3	-3140.2	-5319.2	-172.66	-596.47
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1785.7	3179.0	3599.7	1386.7	629.27

13					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-6283.1	-3031.5	-4963.1	51.922	-736.40
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1544.2	3067.1	3583.9	1596.8	768.43

14					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-6161.6	-2969.8	-4850.2	51.183	-724.20
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1484.2	3001.0	3510.7	1561.5	752.82

15					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-7930.8	-3862.5	-6569.7	-369.32	-647.47
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2153.4	3906.8	4412.0	1561.0	684.13

16					
MINIMUM VALUES					
ELEM	16891	16854	16883	16856	16867
VALUE	-6474.3	-3140.2	-5319.2	-172.66	-596.47
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1785.7	3179.0	3599.7	1386.7	629.27

17					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-8019.2	-3905.8	-6646.3	-378.01	-652.94
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2181.6	3947.8	4453.1	1570.9	687.83

18					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-6281.0	-3039.6	-5123.7	-184.61	-566.92
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1644.5	3065.2	3473.8	1301.1	589.25

19					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-6161.6	-2969.8	-4850.2	51.183	-724.20
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1484.2	3001.0	3510.7	1561.5	752.82

20					
MINIMUM VALUES					
ELEM	16891	16854	16883	16856	16867
VALUE	-6474.3	-3140.2	-5319.2	-172.66	-596.47
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1785.7	3179.0	3599.7	1386.7	629.27

21					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-7930.8	-3862.5	-6569.7	-369.32	-647.47
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2153.4	3906.8	4412.0	1561.0	684.13

22					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-8173.7	-4001.2	-7038.2	-902.75	-411.68
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2412.9	4047.3	4425.0	1192.3	446.68

23					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-8049.9	-3922.5	-6681.7	-371.42	-660.38
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2216.3	3968.3	4475.5	1592.5	698.30

24					
MINIMUM VALUES					
ELEM	16891	16854	16883	16856	16867
VALUE	-6383.6	-3095.2	-5241.7	-162.63	-591.71
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1760.4	3133.5	3548.5	1373.0	624.13

25					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-6192.3	-2986.5	-4885.6	51.844	-731.64
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1518.9	3021.6	3533.0	1583.1	763.28

26					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-8104.5	-3948.7	-6719.7	-388.35	-656.52
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2204.5	3994.1	4509.1	1587.3	693.91

27					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-6565.3	-3182.8	-5368.4	-219.08	-578.84
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1720.9	3219.3	3660.4	1355.7	609.51

28					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-6246.9	-3012.8	-4923.6	51.120	-727.77
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1507.1	3047.3	3566.7	1577.9	758.90

29					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-6073.2	-2926.5	-4773.7	51.042	-718.73
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1456.2	2960.1	3470.2	1551.6	749.11

30					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-8049.9	-3922.5	-6681.7	-371.42	-660.38
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	2216.3	3968.3	4475.5	1592.5	698.30

31					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-6192.3	-2986.5	-4885.6	51.844	-731.64
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1518.9	3021.6	3533.0	1583.1	763.28

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32					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-6026.4	-2938.3	-5022.1	-320.50	-473.60
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1671.3	2972.6	3342.2	1158.2	501.71

33					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-4785.7	-2322.3	-3948.6	-167.04	-421.25
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1327.1	2350.8	2652.4	992.33	445.12

34					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-4658.3	-2249.8	-3711.2	34.652	-514.53
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1165.9	2276.2	2640.5	1132.4	537.89

35					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-4656.9	-2255.2	-3818.3	-175.00	-401.55
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1233.0	2274.9	2568.5	935.24	418.43

36					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-5886.5	-2868.3	-4895.8	-312.42	-461.83
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1612.5	2901.3	3265.7	1128.0	488.83

37					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-4725.2	-2292.3	-3897.0	-160.35	-418.08
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1310.2	2320.5	2618.3	983.19	441.69

38					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-5945.4	-2897.2	-4946.8	-318.21	-465.47
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1631.2	2928.6	3293.1	1134.7	491.30

39					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-4656.9	-2255.2	-3818.3	-175.00	-401.55
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1233.0	2274.9	2568.5	935.24	418.43

40					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-4577.4	-2208.7	-3636.0	34.159	-506.40
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1125.9	2232.2	2591.7	1108.9	527.48

41					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-4870.6	-2363.2	-4007.7	-193.38	-415.24
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1308.7	2390.9	2704.7	984.23	438.30

42					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-5886.5	-2868.3	-4895.8	-312.42	-461.83
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1612.5	2901.3	3265.7	1128.0	488.83

43					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-6048.4	-2960.8	-5208.1	-668.03	-304.63
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1785.4	2994.9	3274.4	882.22	330.53

44					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-5965.9	-2908.3	-4970.4	-313.82	-470.43
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1654.4	2942.3	3308.1	1149.1	498.27

45					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-4725.2	-2292.3	-3897.0	-160.35	-418.08
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1310.2	2320.5	2618.3	983.19	441.69

46					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-4597.8	-2219.8	-3659.6	34.600	-511.36
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1149.1	2245.8	2606.5	1123.3	534.46

47					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-6002.3	-2925.8	-4995.8	-325.11	-467.85
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1646.5	2959.4	3330.5	1145.6	495.35

48					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-4846.5	-2350.7	-3981.4	-197.99	-409.49
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1283.9	2377.7	2692.9	971.62	431.94

49					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-4634.2	-2237.3	-3684.9	34.117	-508.78
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1141.2	2263.0	2629.0	1119.8	531.53

50					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-4518.4	-2179.8	-3584.9	34.065	-502.76
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1107.2	2204.8	2564.6	1102.2	525.01

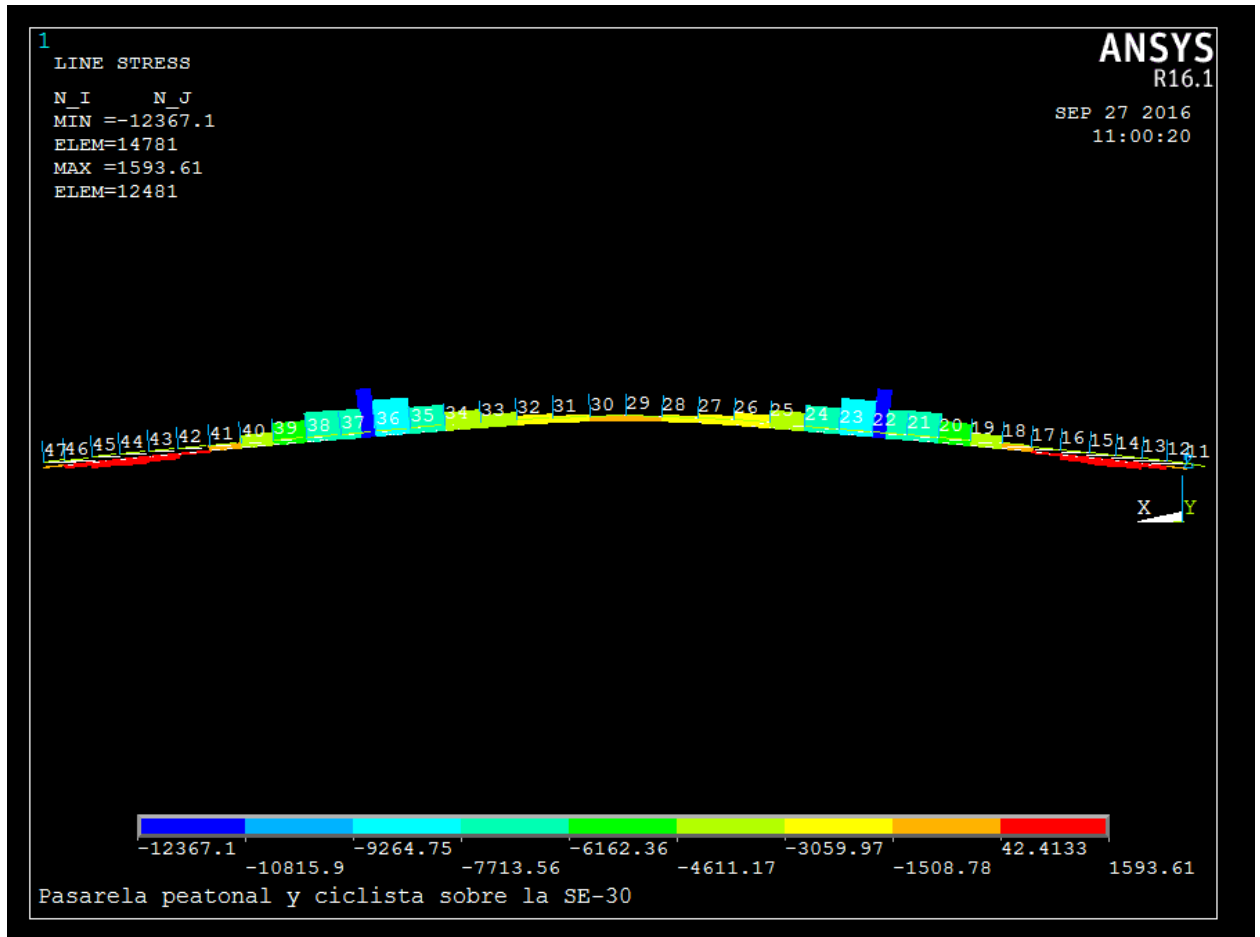
51					
MINIMUM VALUES					
ELEM	16848	16854	16883	16856	16867
VALUE	-4785.7	-2322.3	-3948.6	-167.04	-421.25
MAXIMUM VALUES					
ELEM	16919	16885	16998	16870	16870
VALUE	1327.1	2350.8	2652.4	992.33	445.12

52					
MINIMUM VALUES					
ELEM	16848	16854	16883	16857	16867
VALUE	-4597.8	-2219.8	-3659.6	34.600	-511.36
MAXIMUM VALUES					
ELEM	16920	16885	16997	16870	16870
VALUE	1149.1	2245.8	2606.5	1123.3	534.46

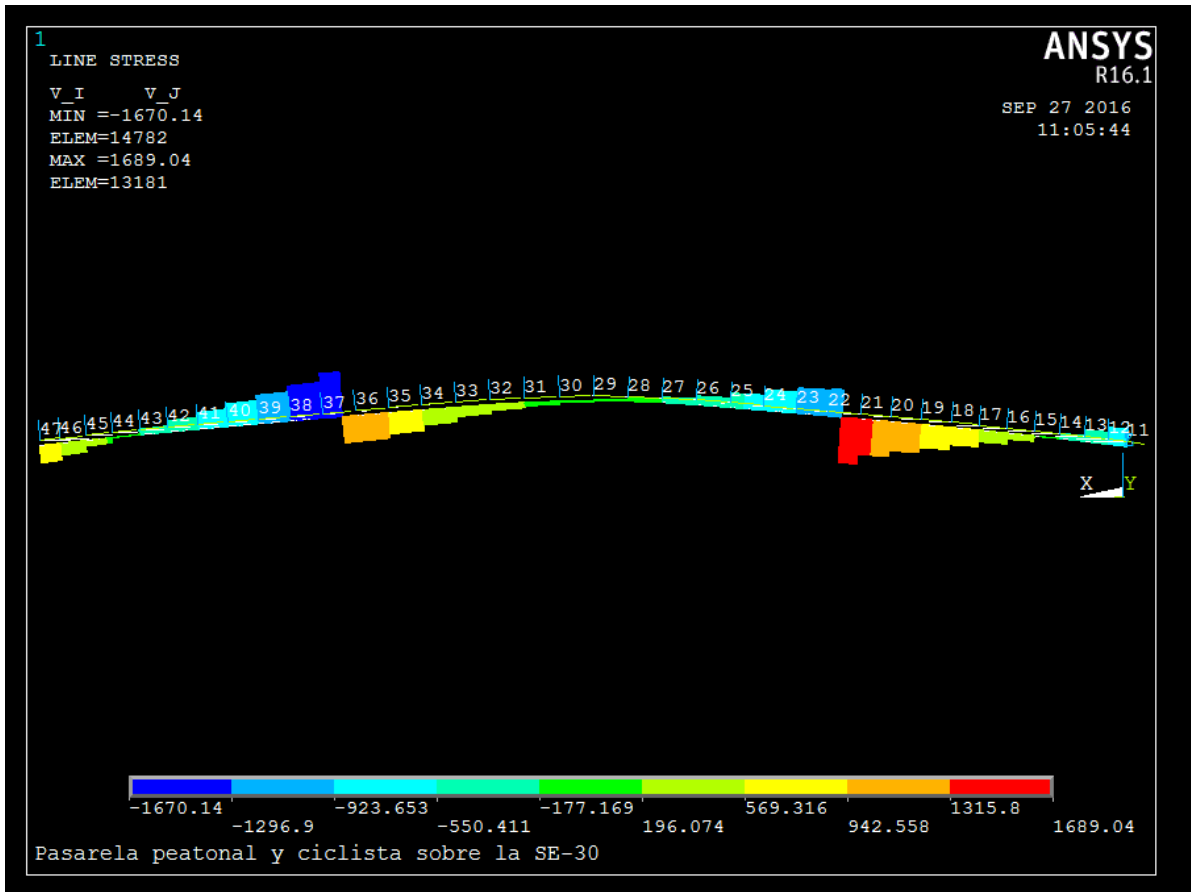
1.2 Diagramas de esfuerzo

1.2.1 Tubo

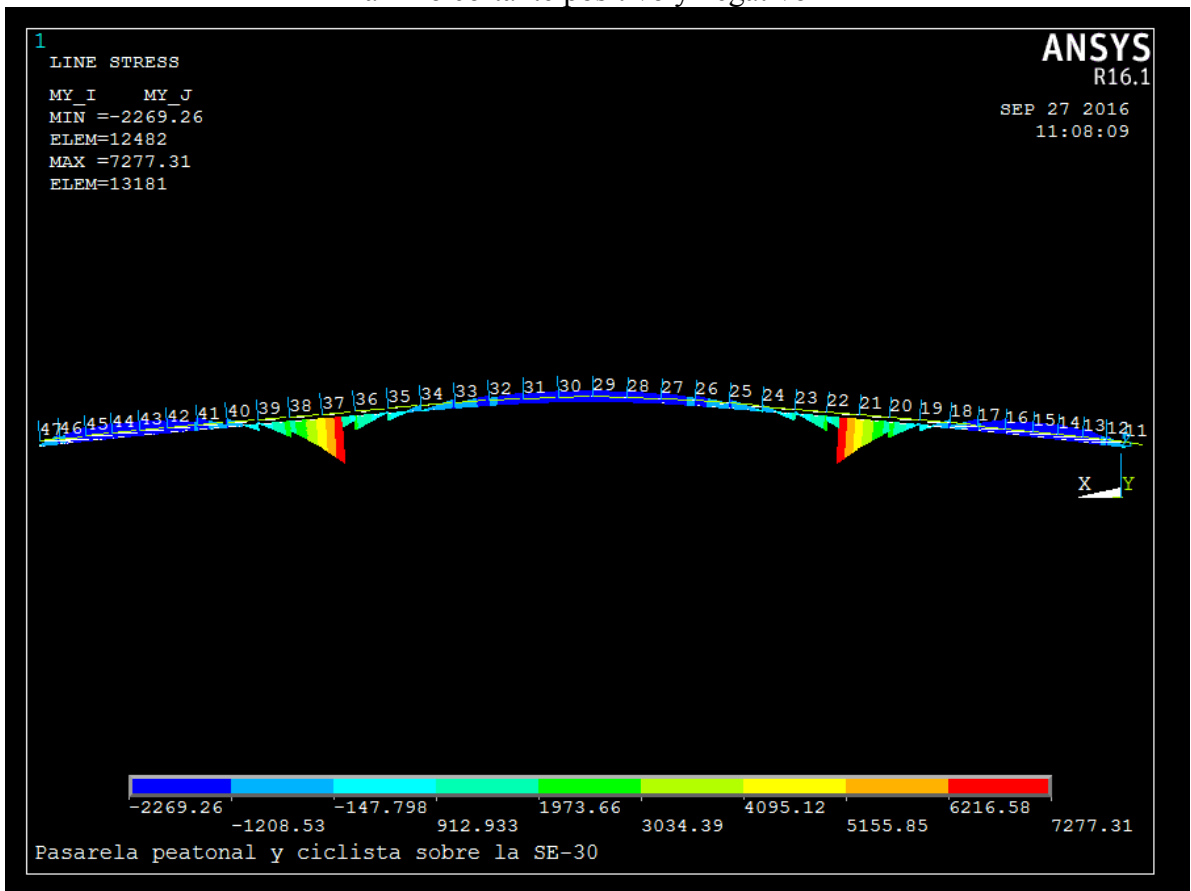
1.2.1.1 ELU



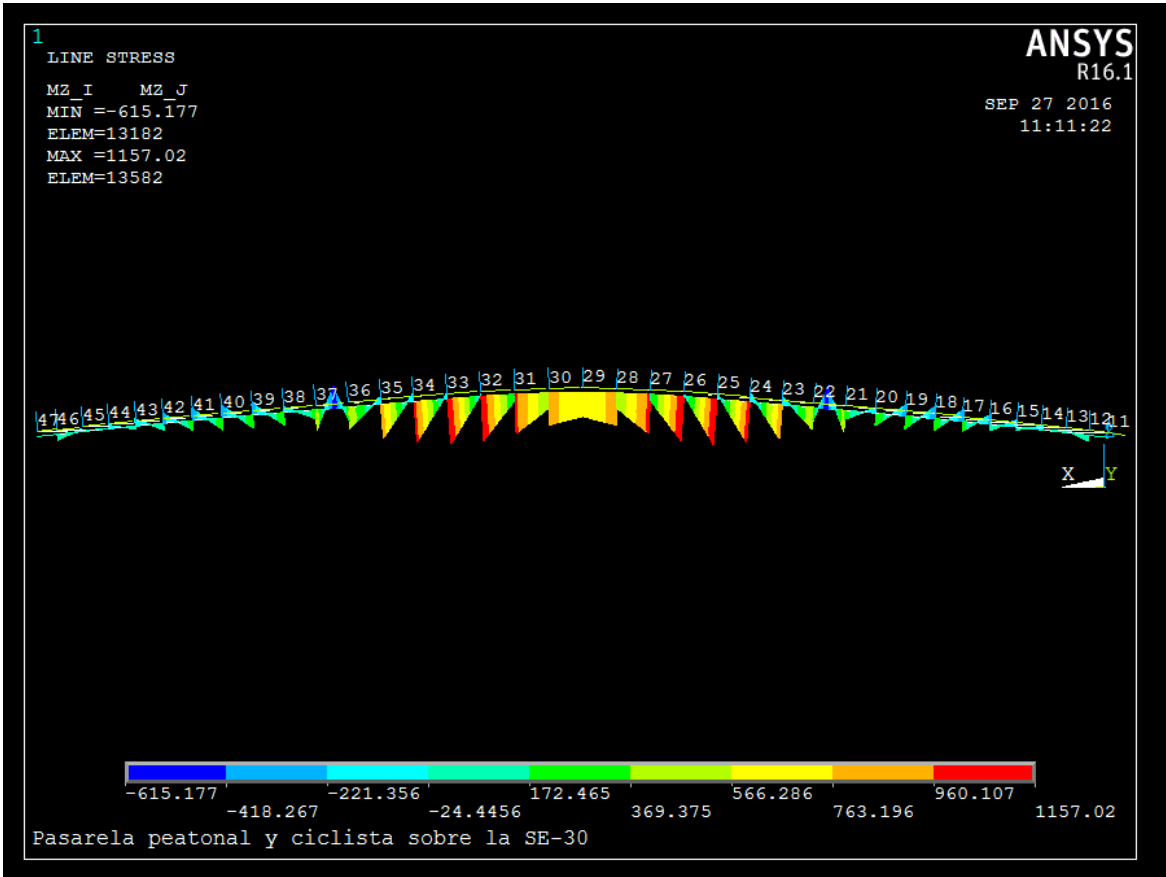
Máximo axil positivo y negativo



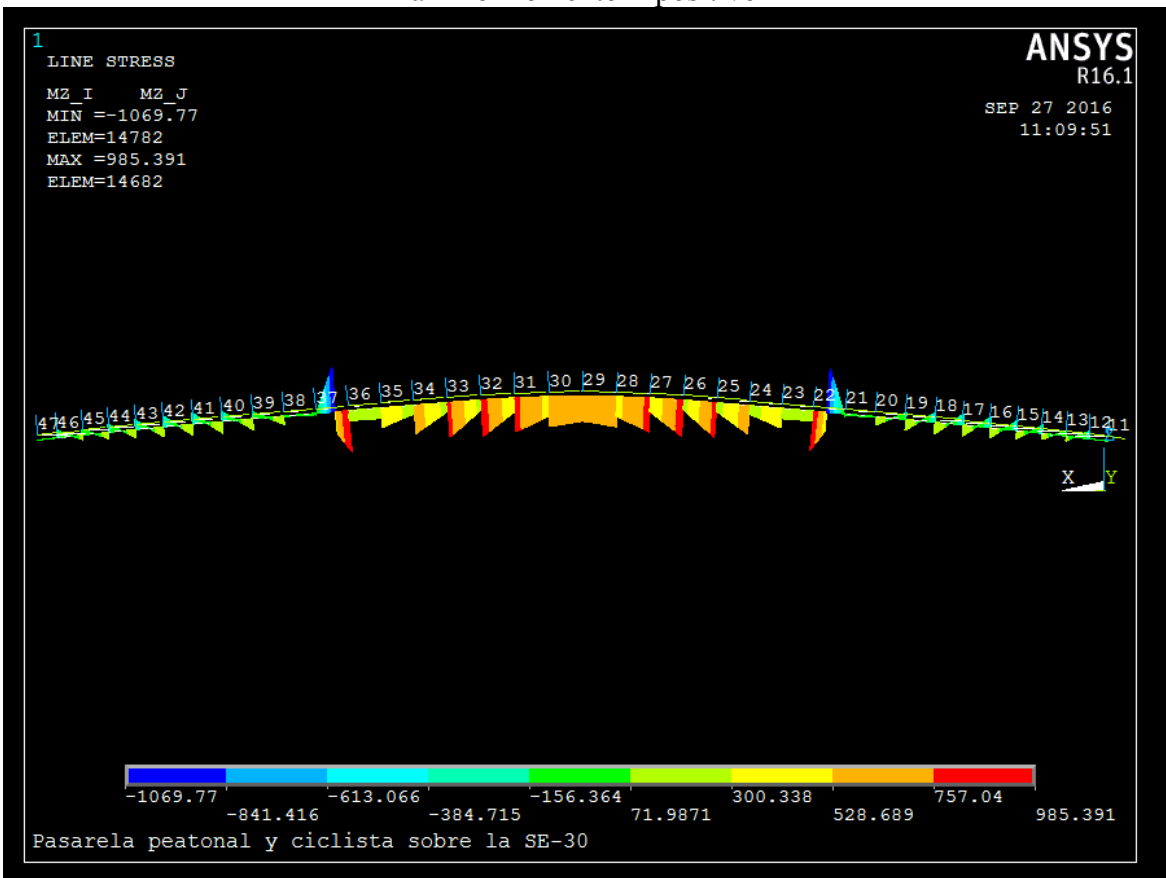
Máximo cortante positivo y negativo



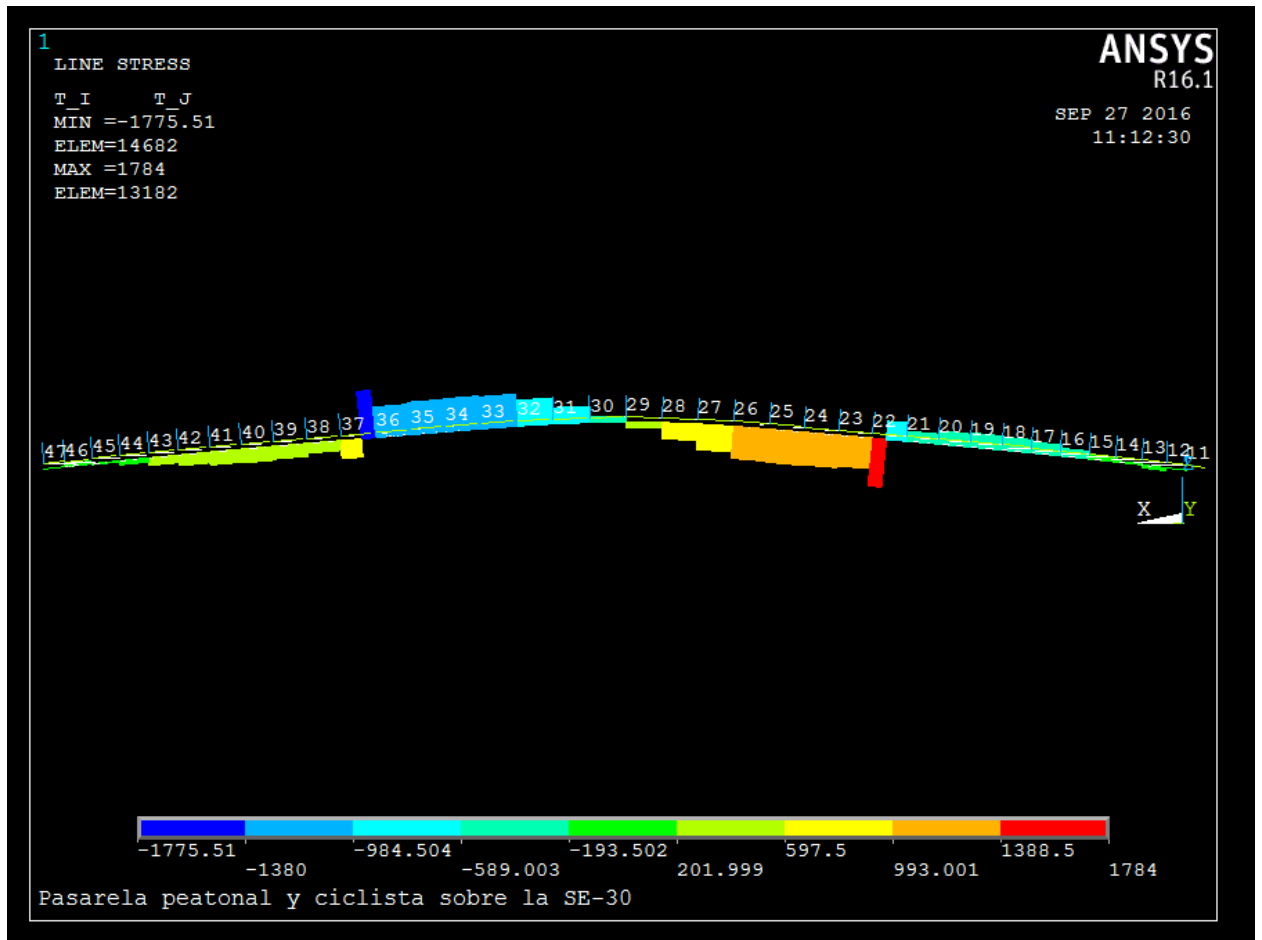
Máximo momento Y positivo y negativo



Máximo momento Z positivo

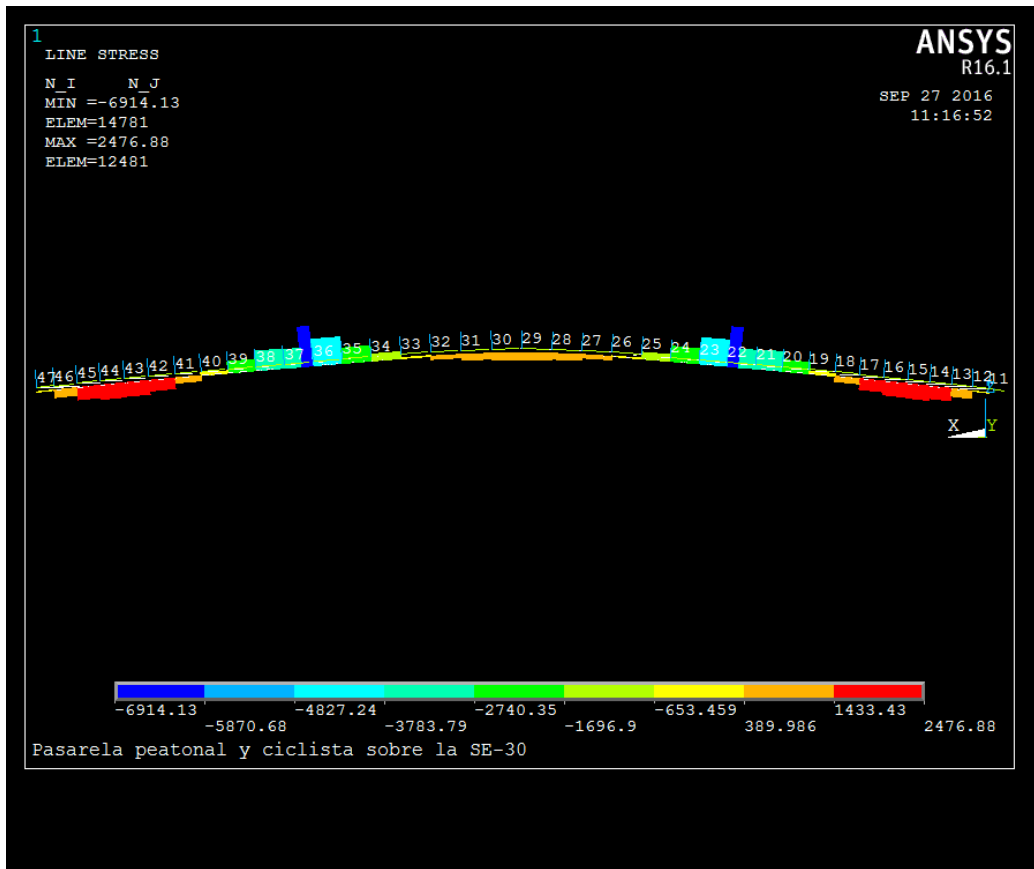


Máximo momento Z negativo

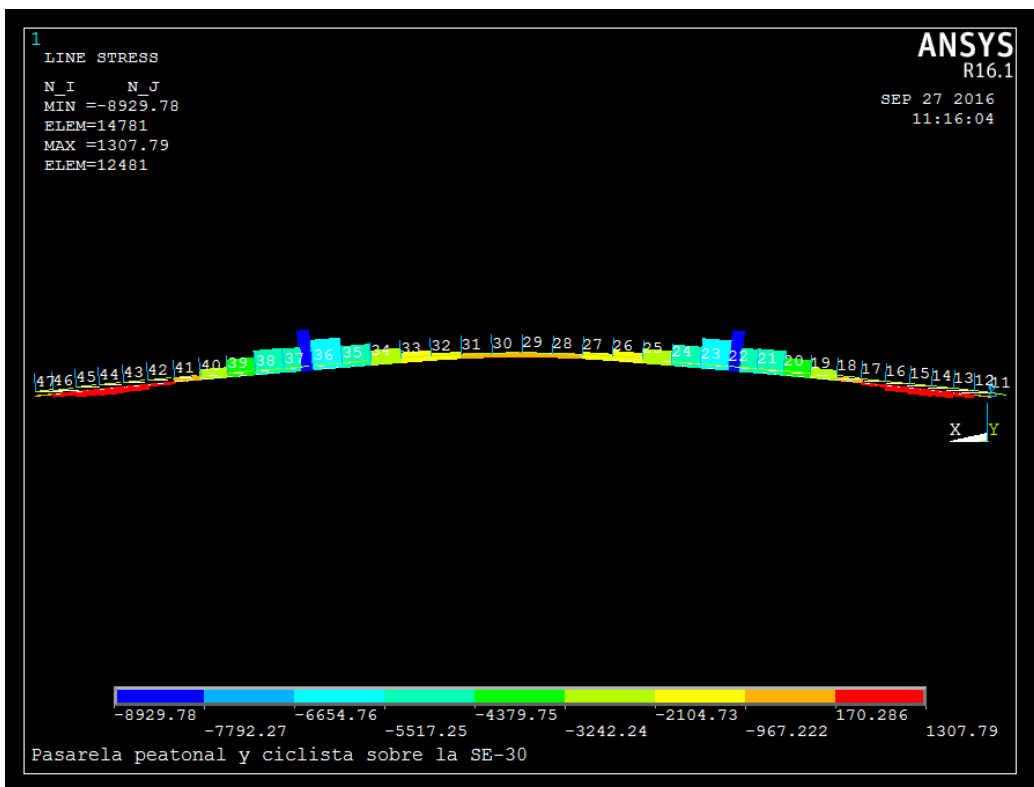


Máximo torsor positivo y negativo

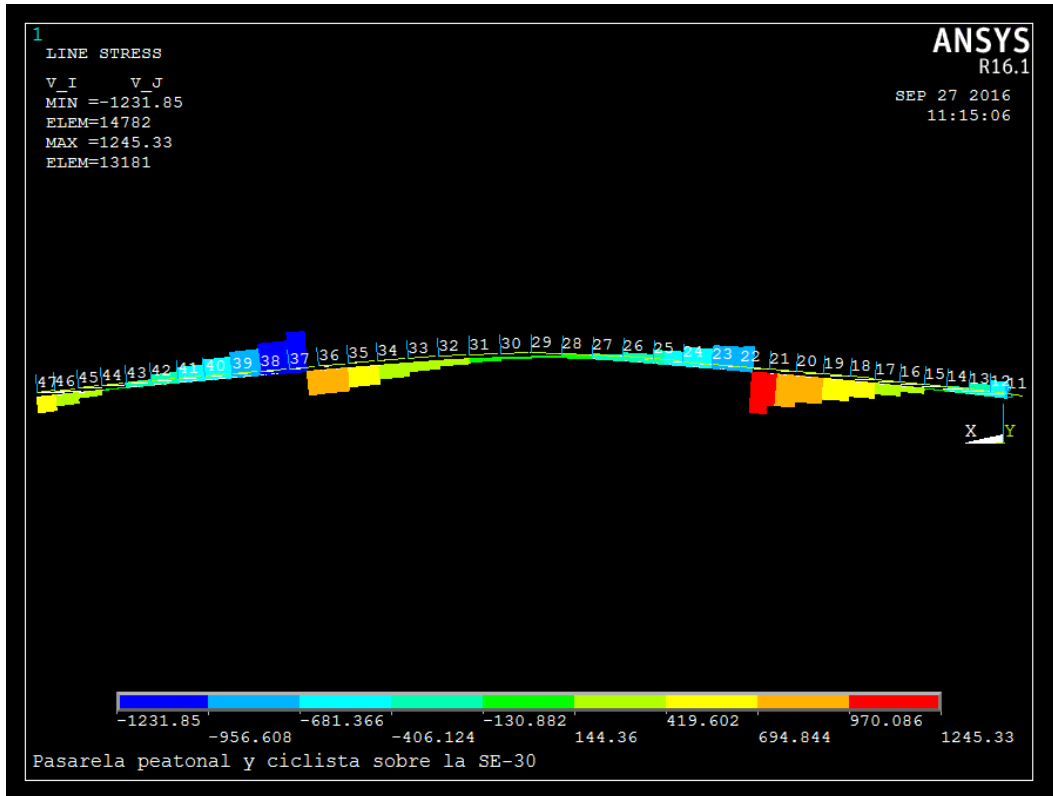
1.2.1.2 ELS



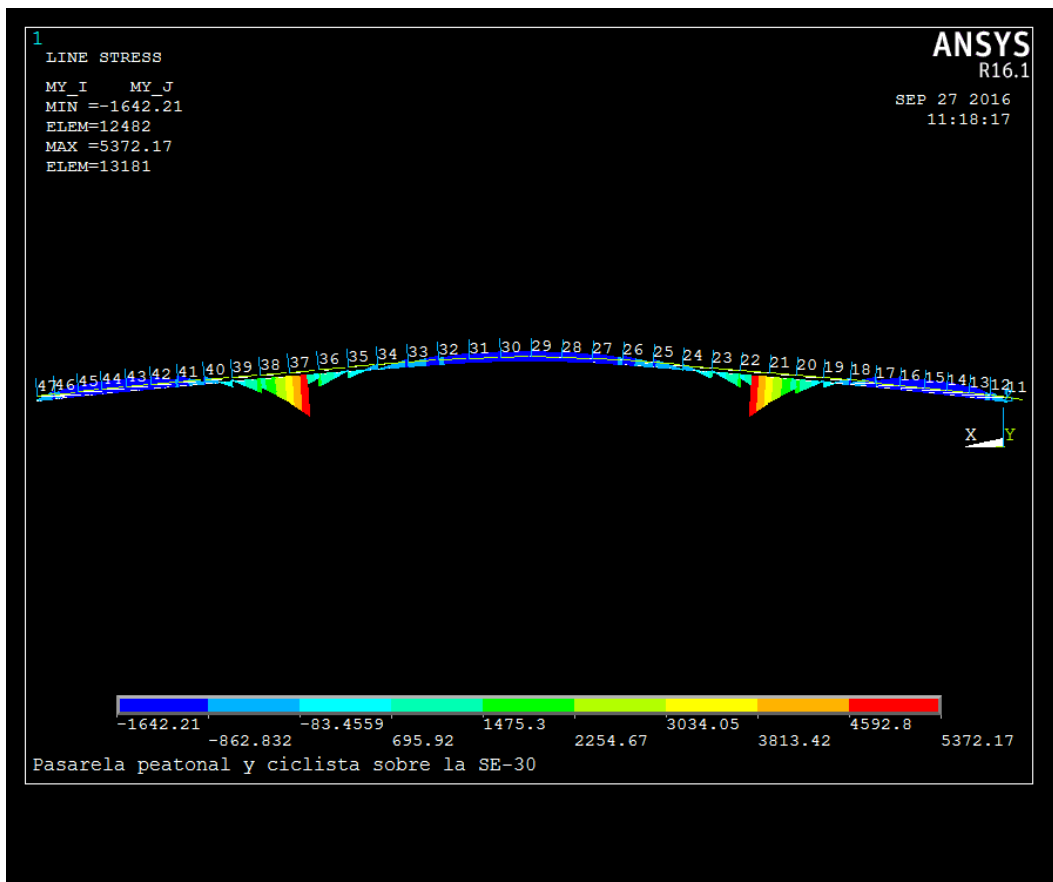
Máximo axil positivo



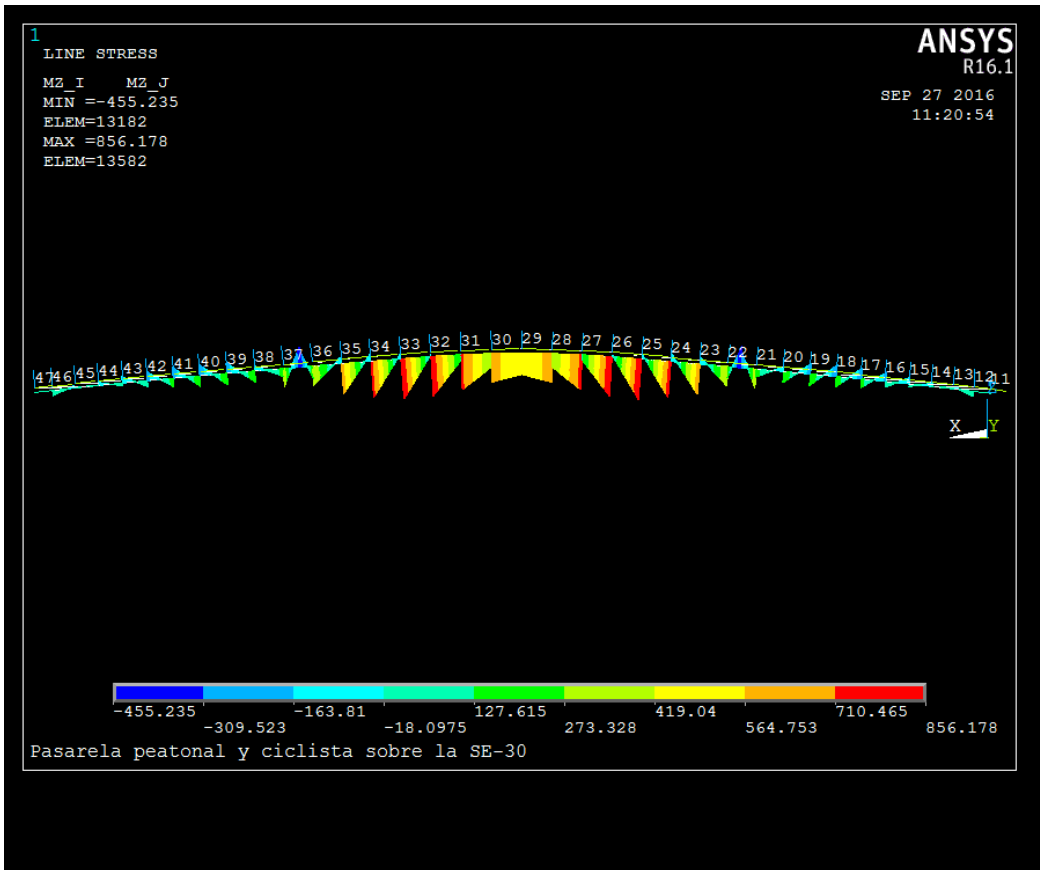
Máximo axil negativo



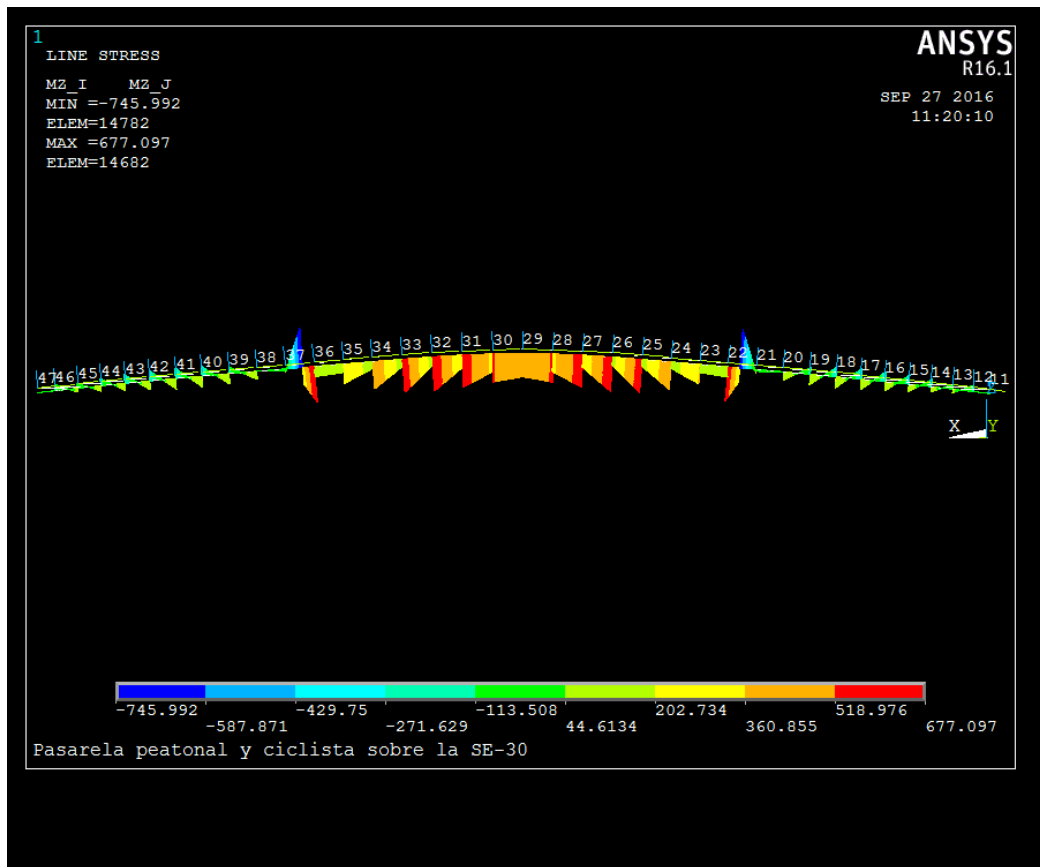
Máximo cortante positivo y negativo



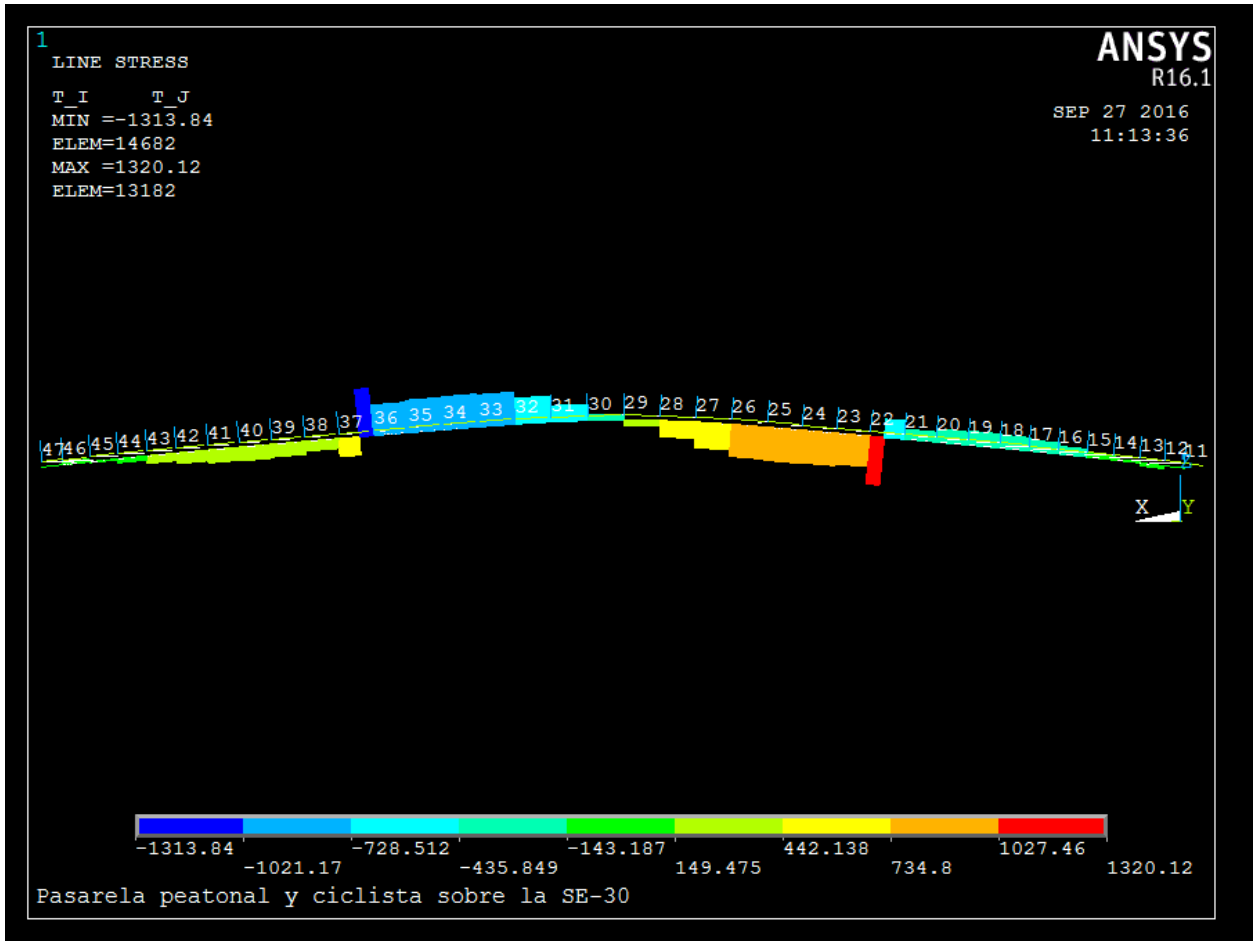
Máximo momento Y positivo y negativo



Máximo momento Z positivo



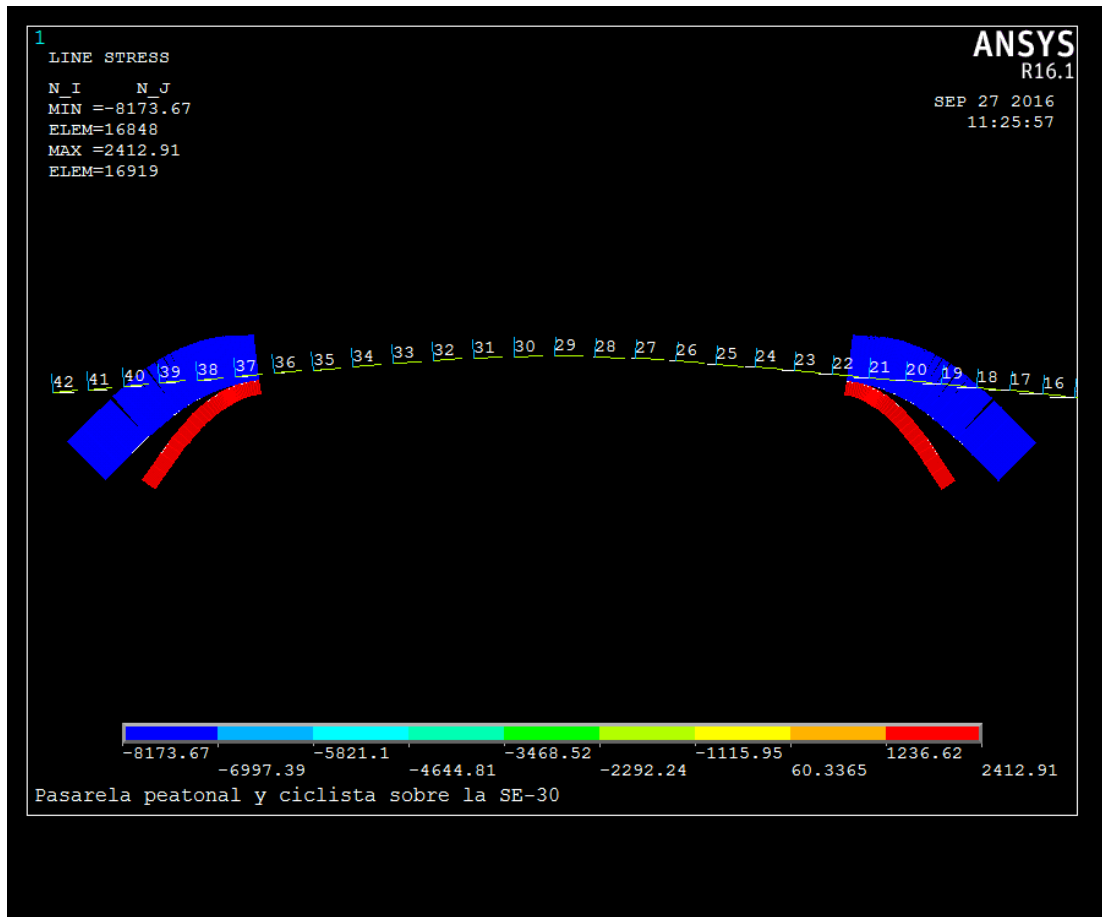
Máximo momento Z negativo



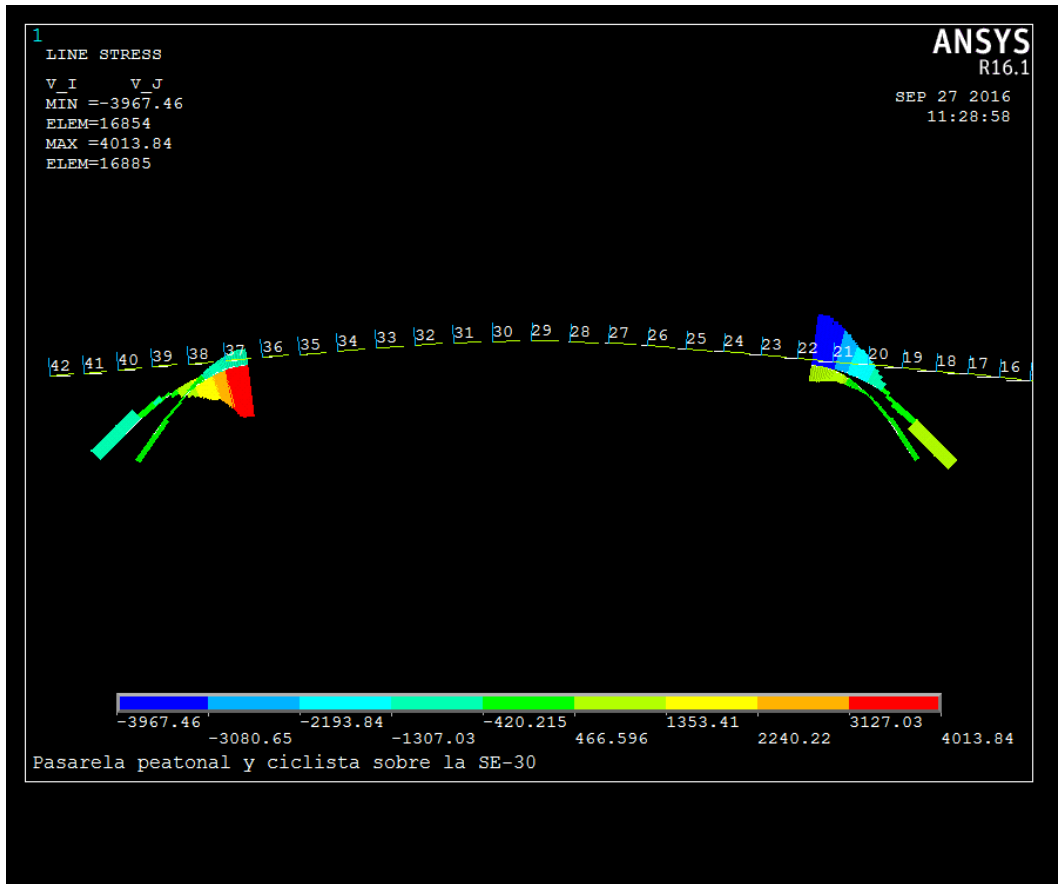
Máximo torsor positivo y negativo

1.2.2 Estribos

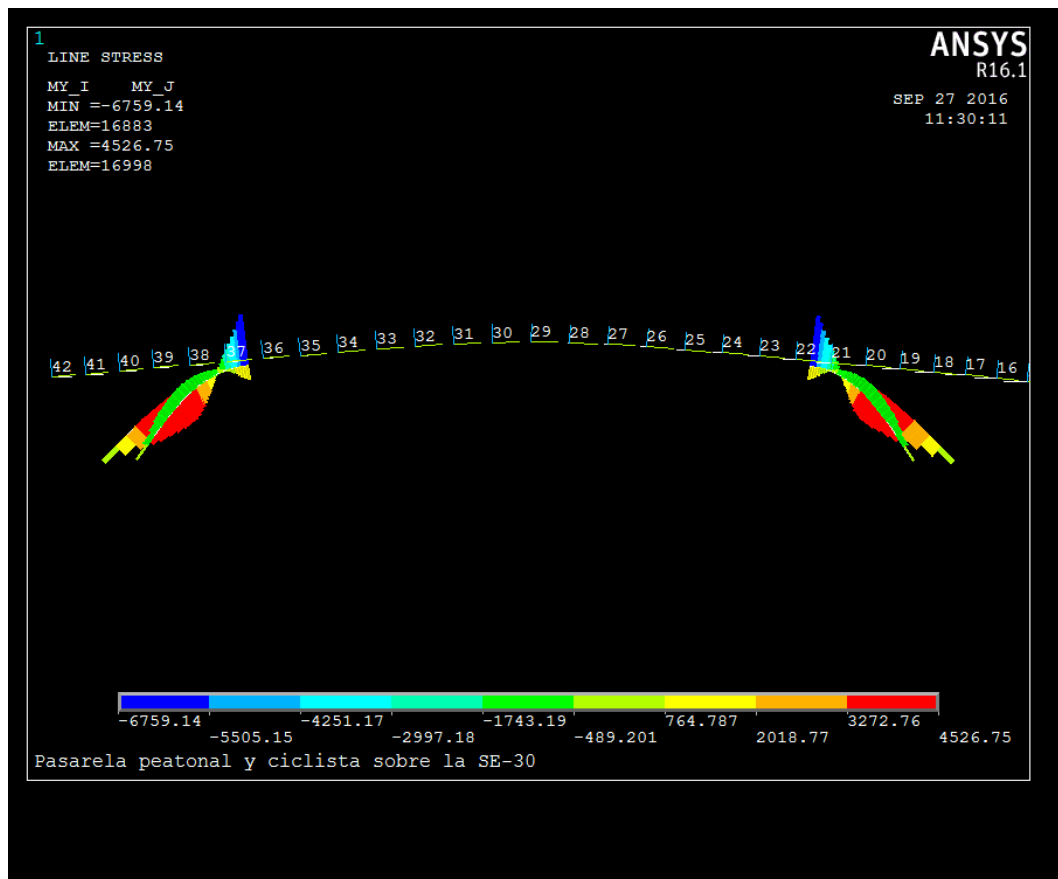
1.2.2.1 ELU



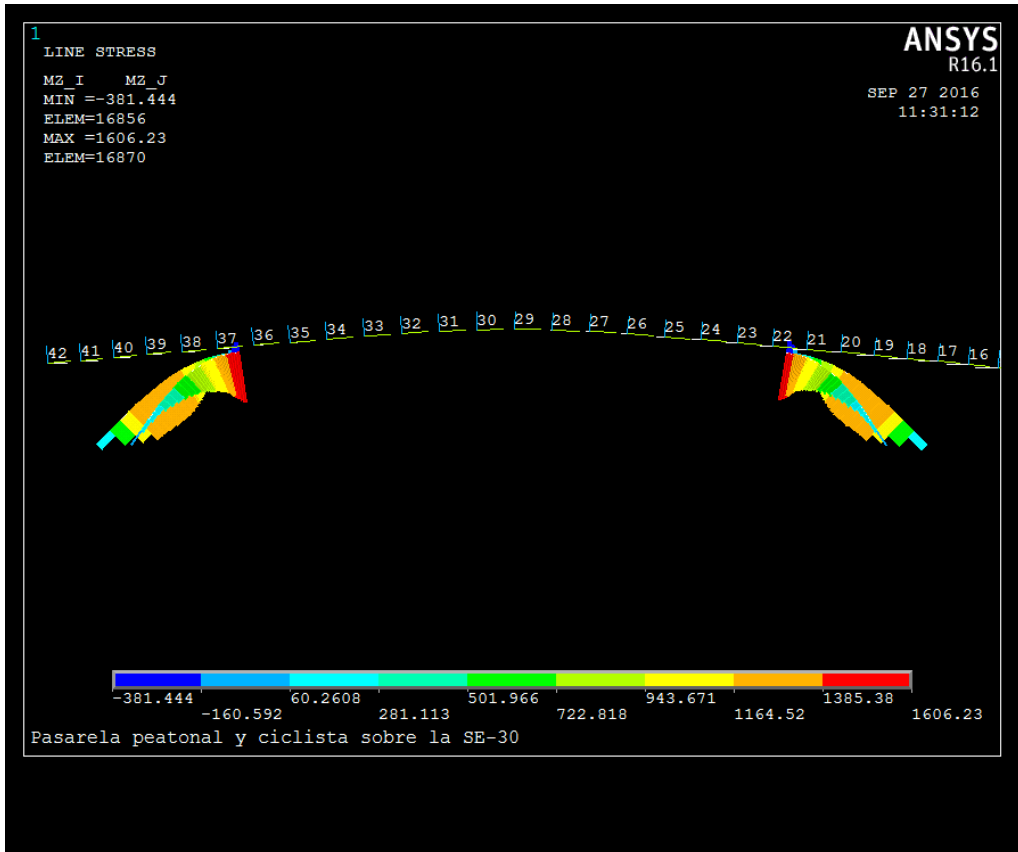
Máximo axil positivo y negativo



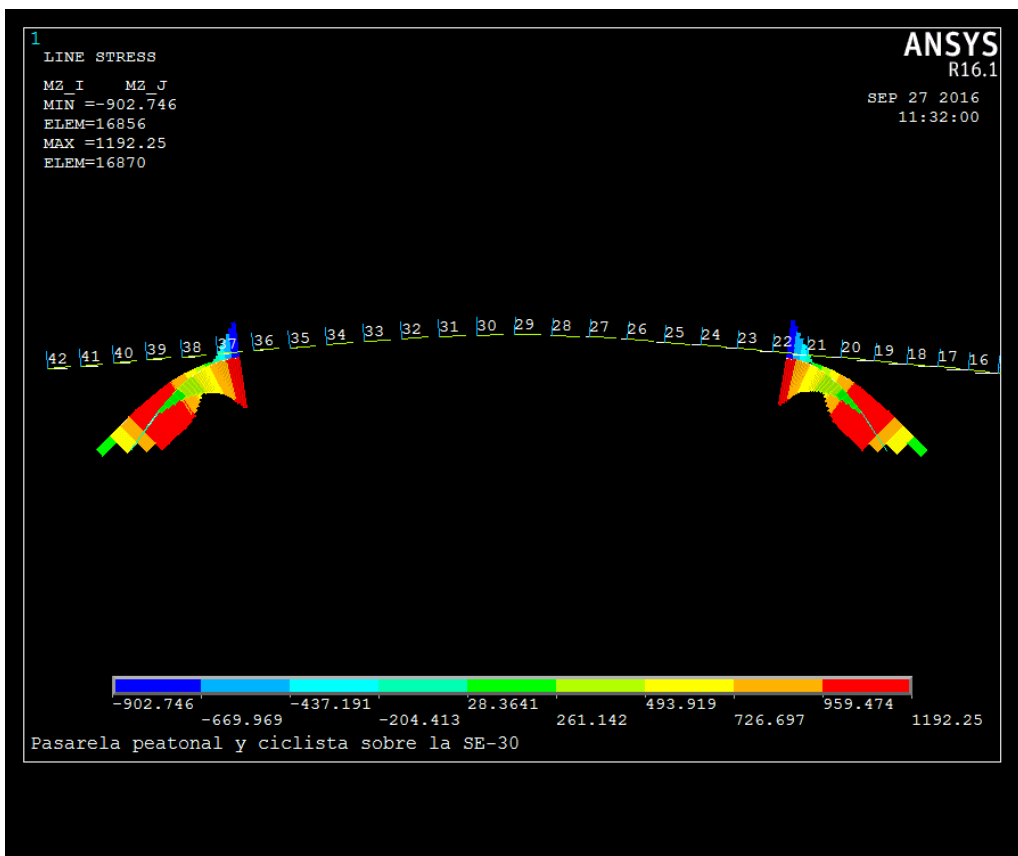
Máximo cortante positivo y negativo



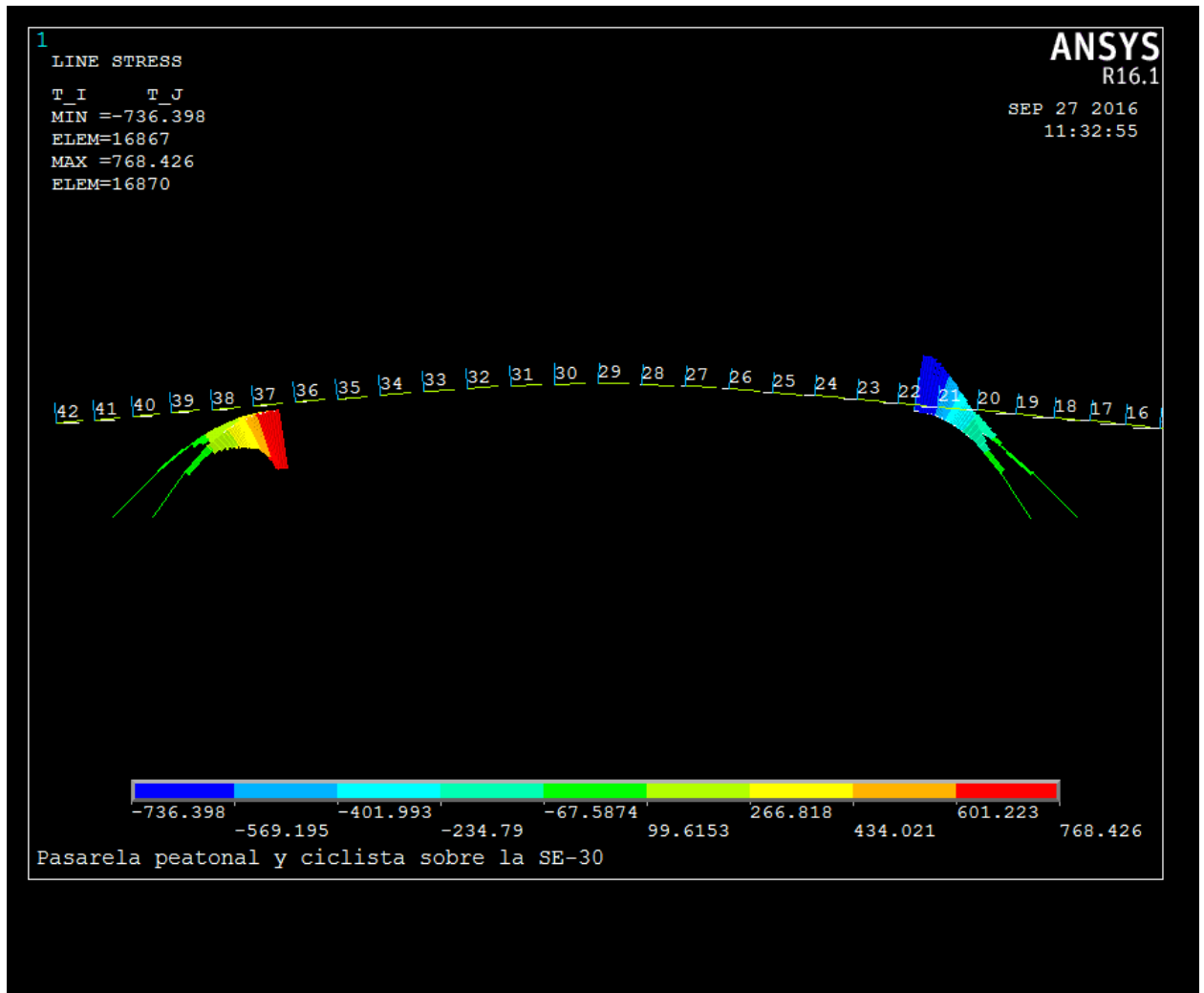
Máximo momento Y positivo y negativo



Máximo momento Z positivo

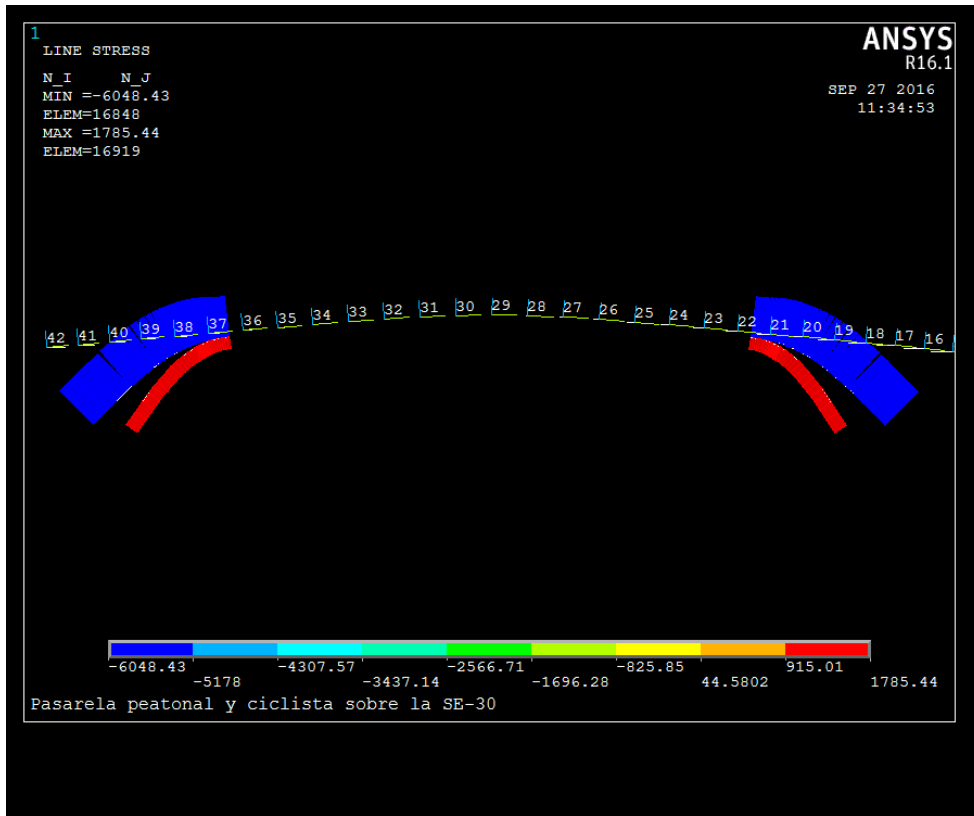


Máximo momento Z negativo

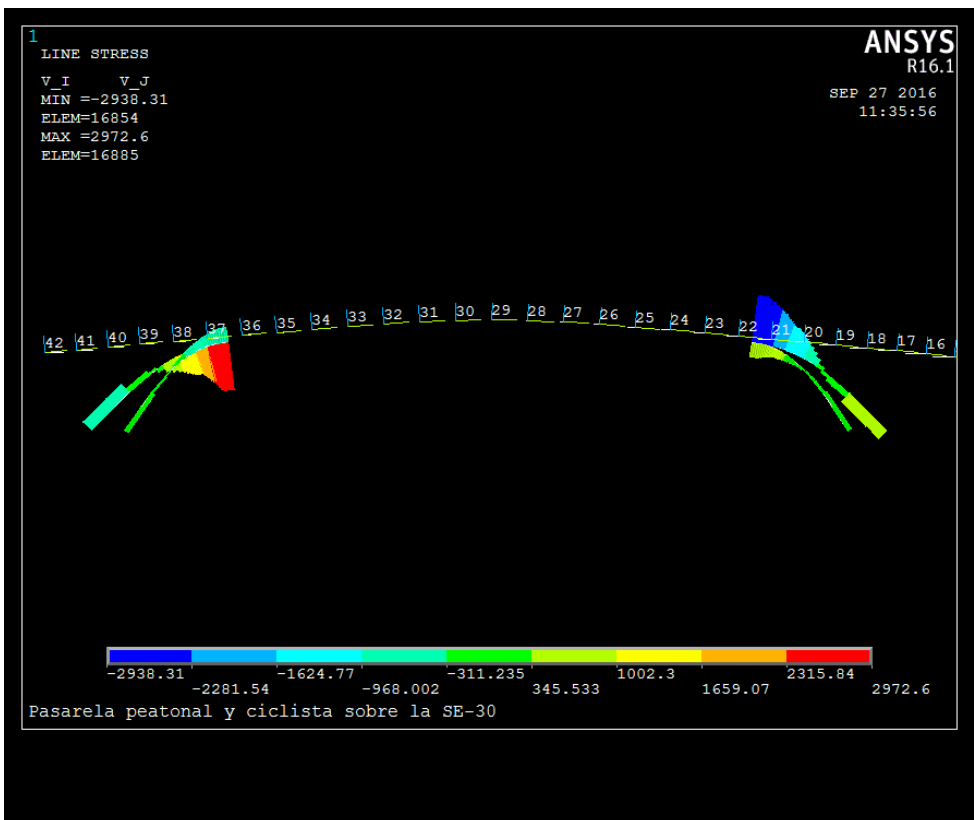


Máximo torsor positivo y negativo

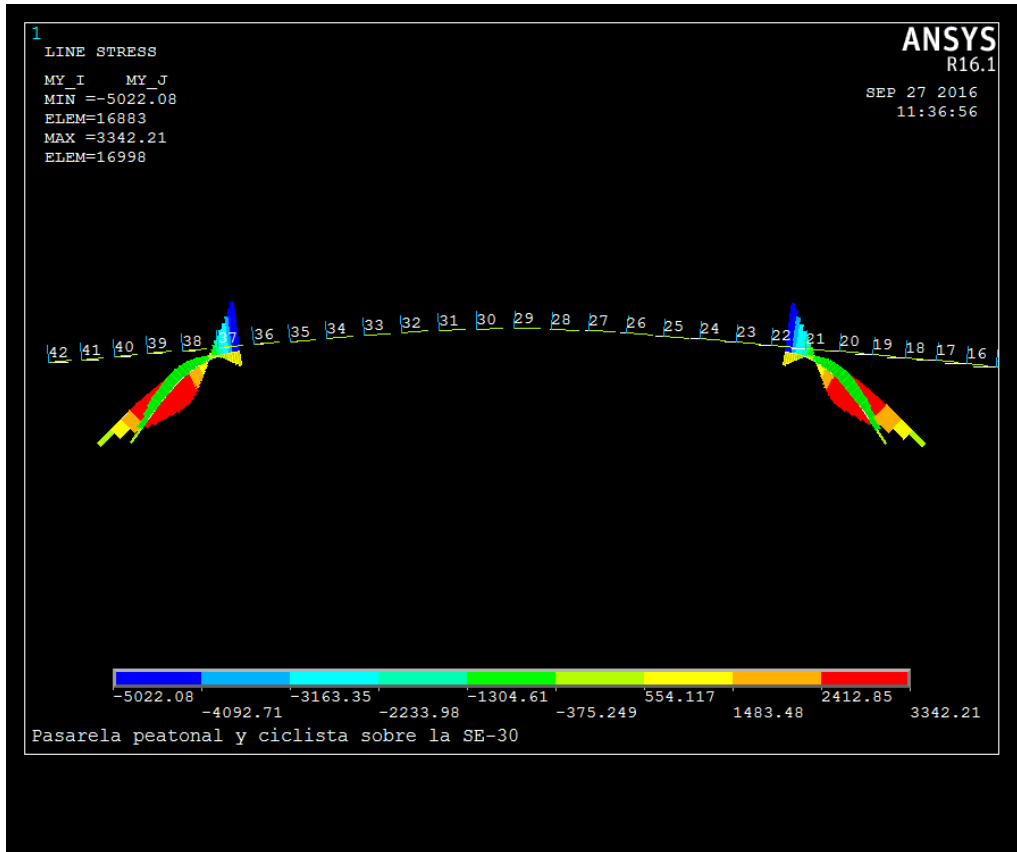
1.2.2.2 ELS



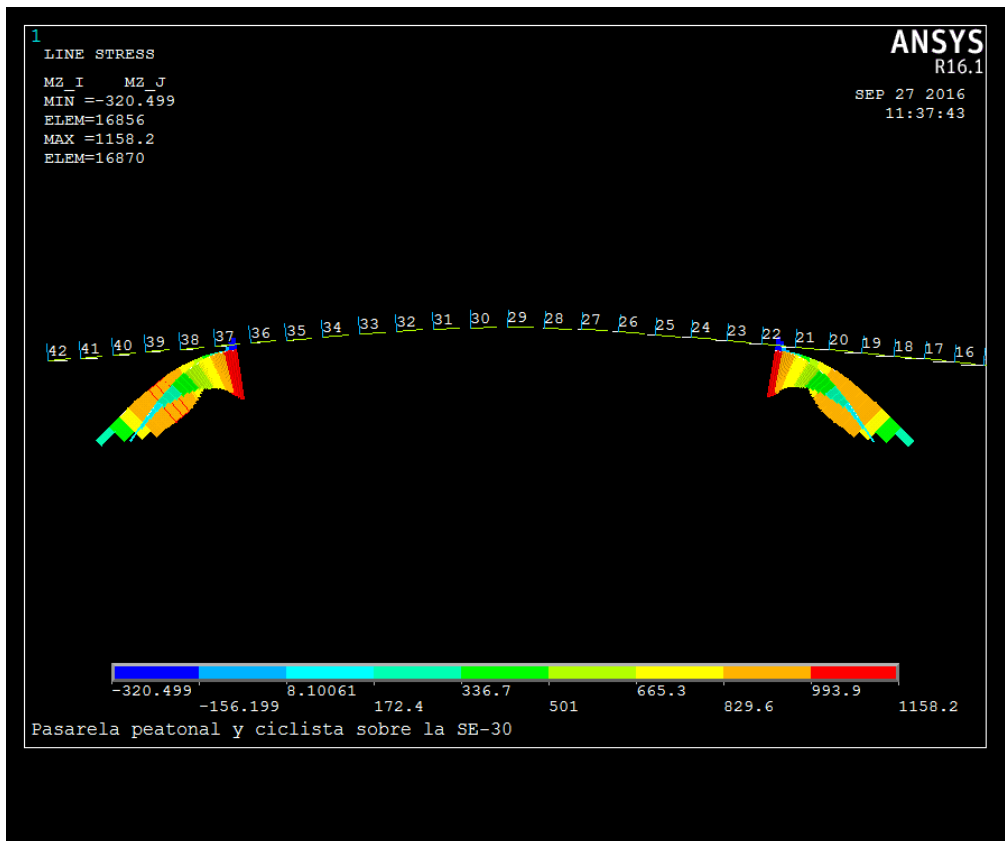
Máximo axil positivo y negativo



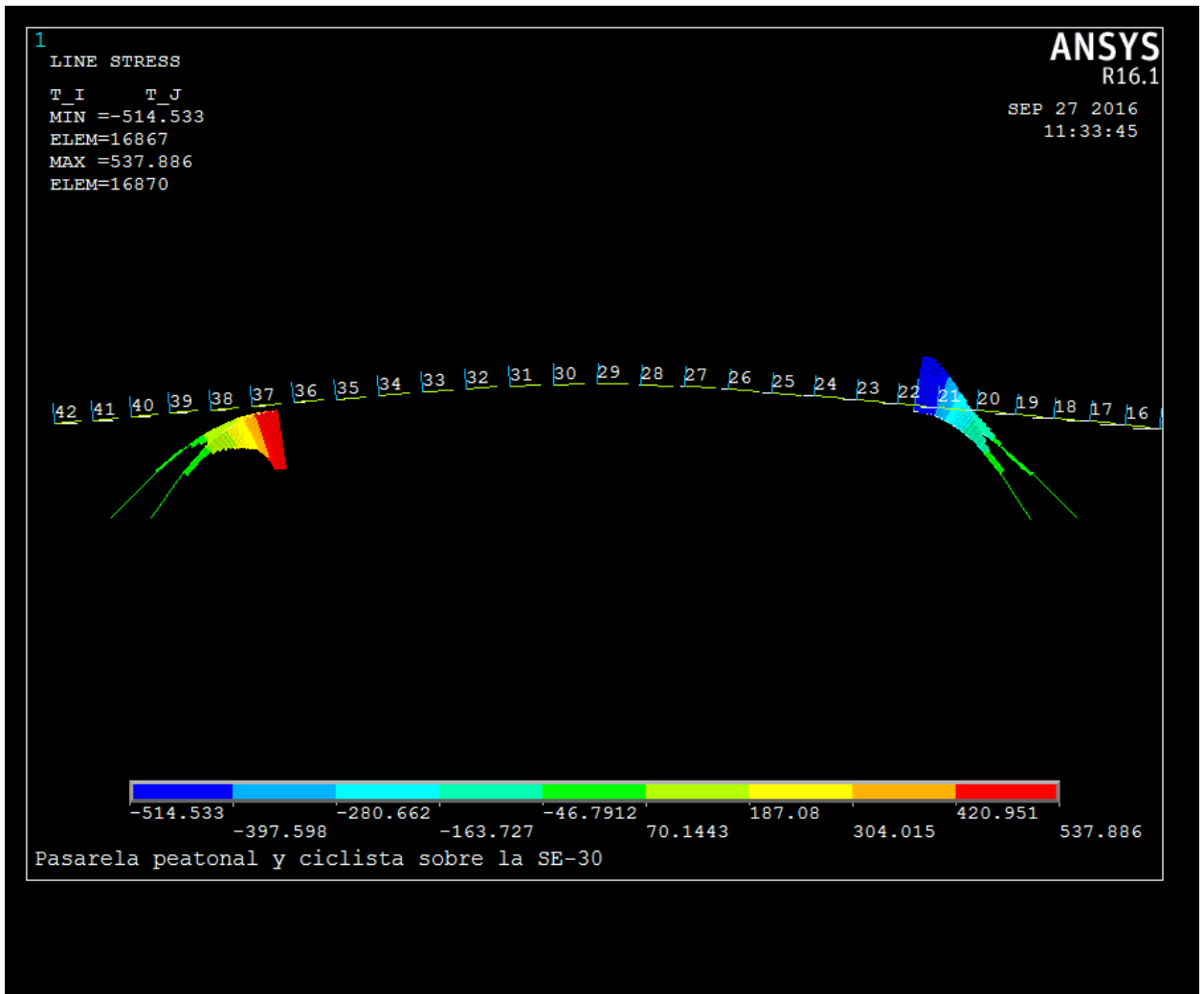
Máximo cortante positivo y negativo



Máximo momento Y positivo y negativo

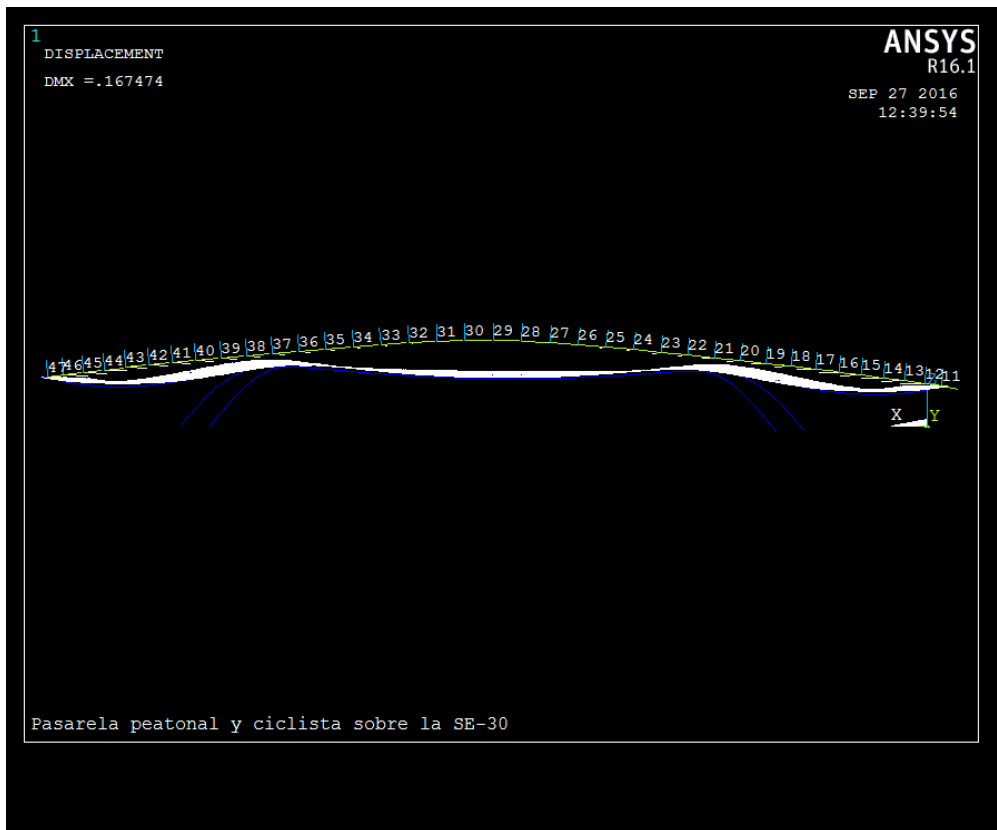


Máximo momento Z positivo y negativo

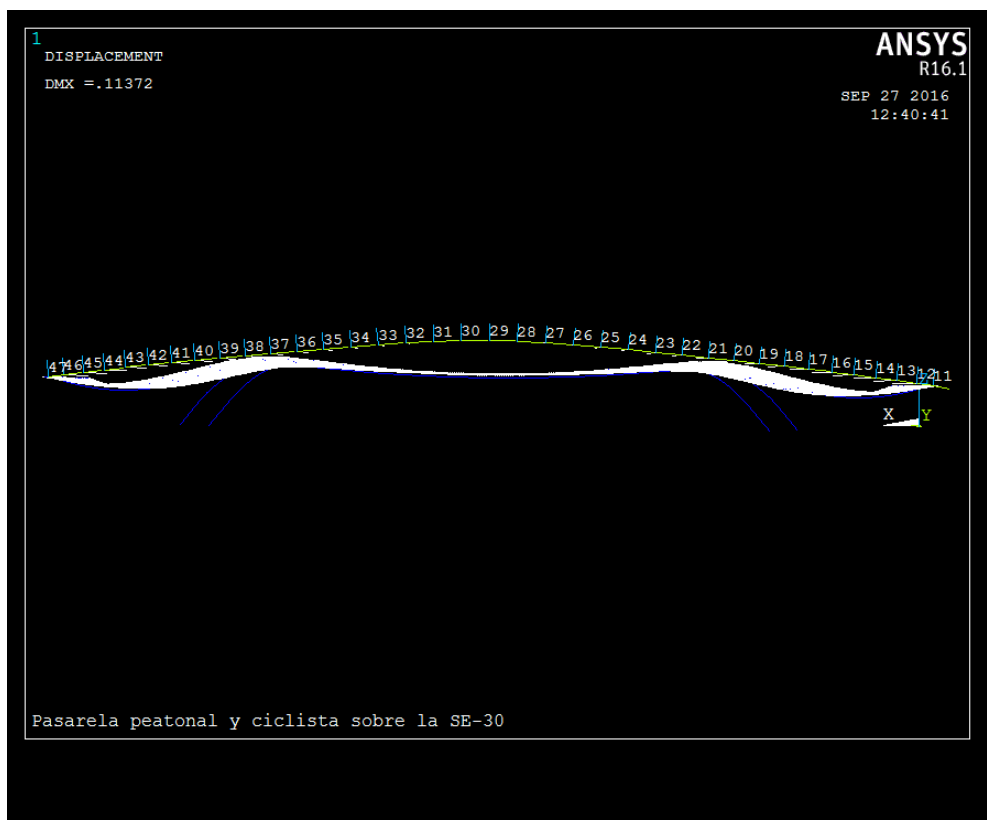


Máximo torsor positivo y negativo

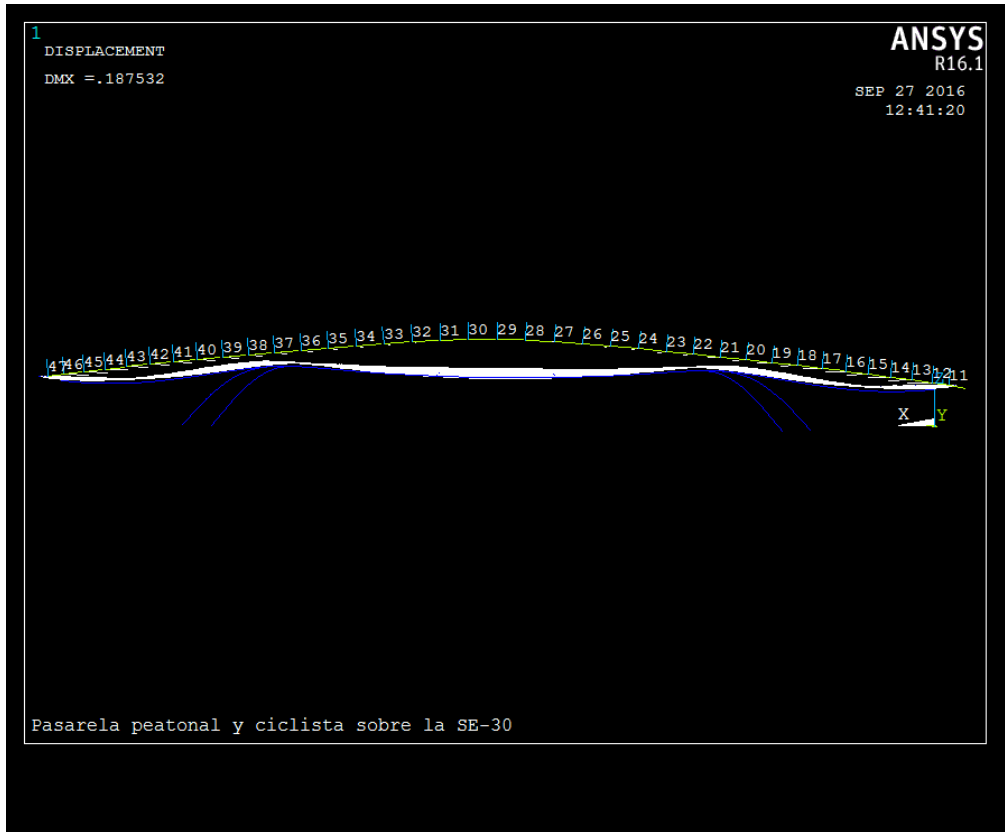
1.3 Deformadas



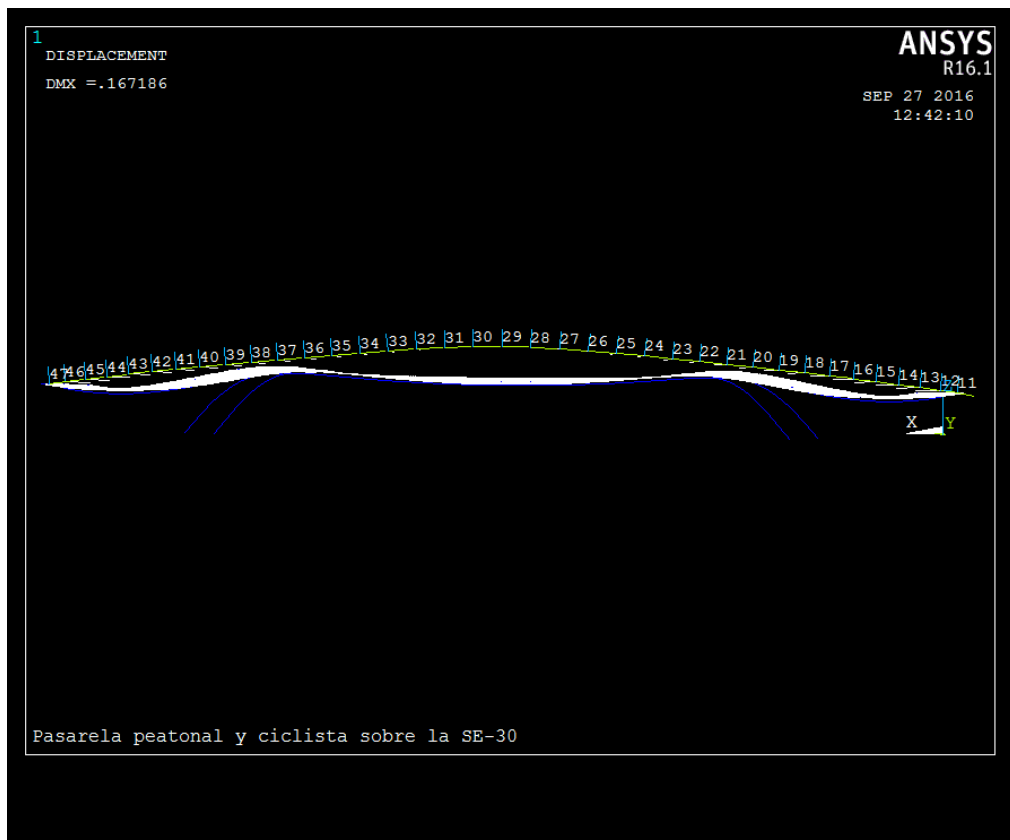
Deformada combinación 11



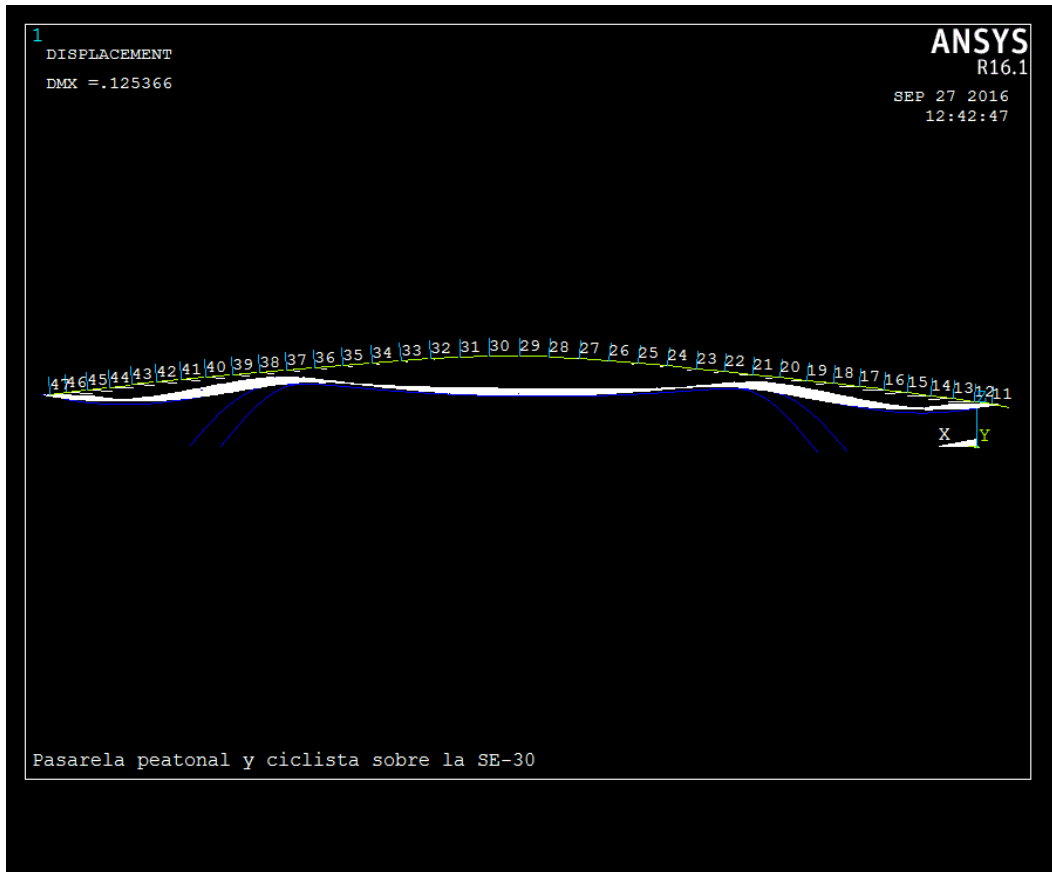
Deformada combinación 13



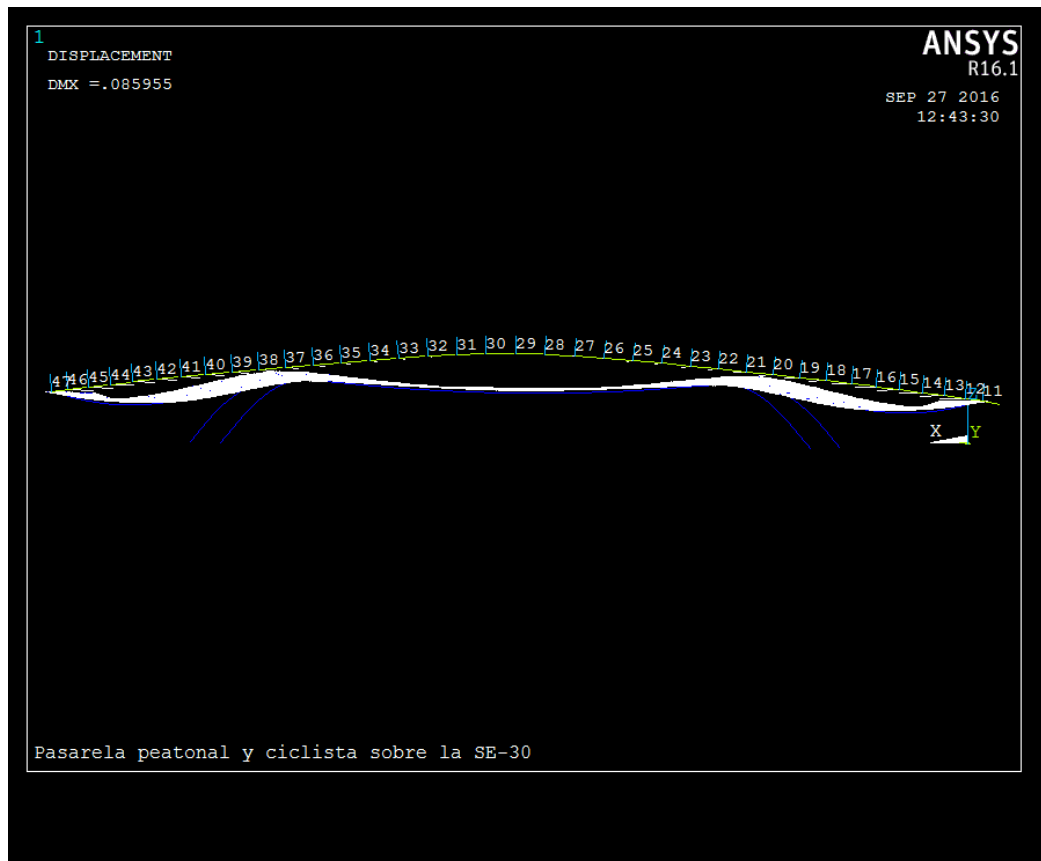
Deformada combinación 22



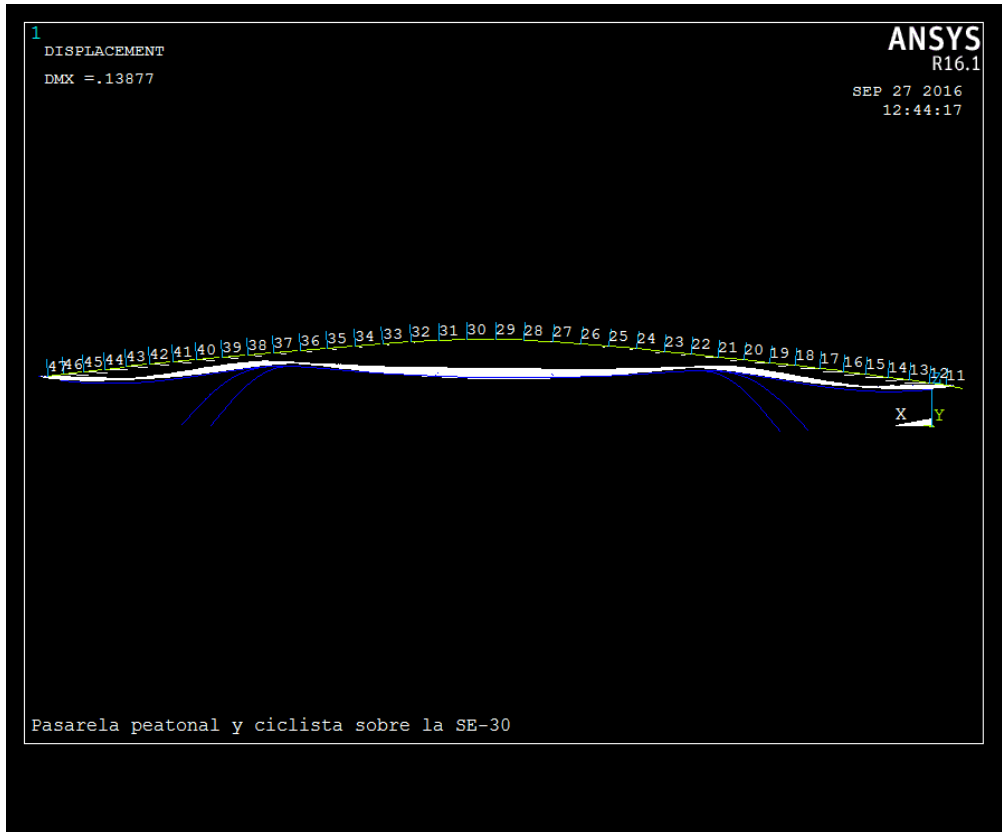
Deformada combinación 26



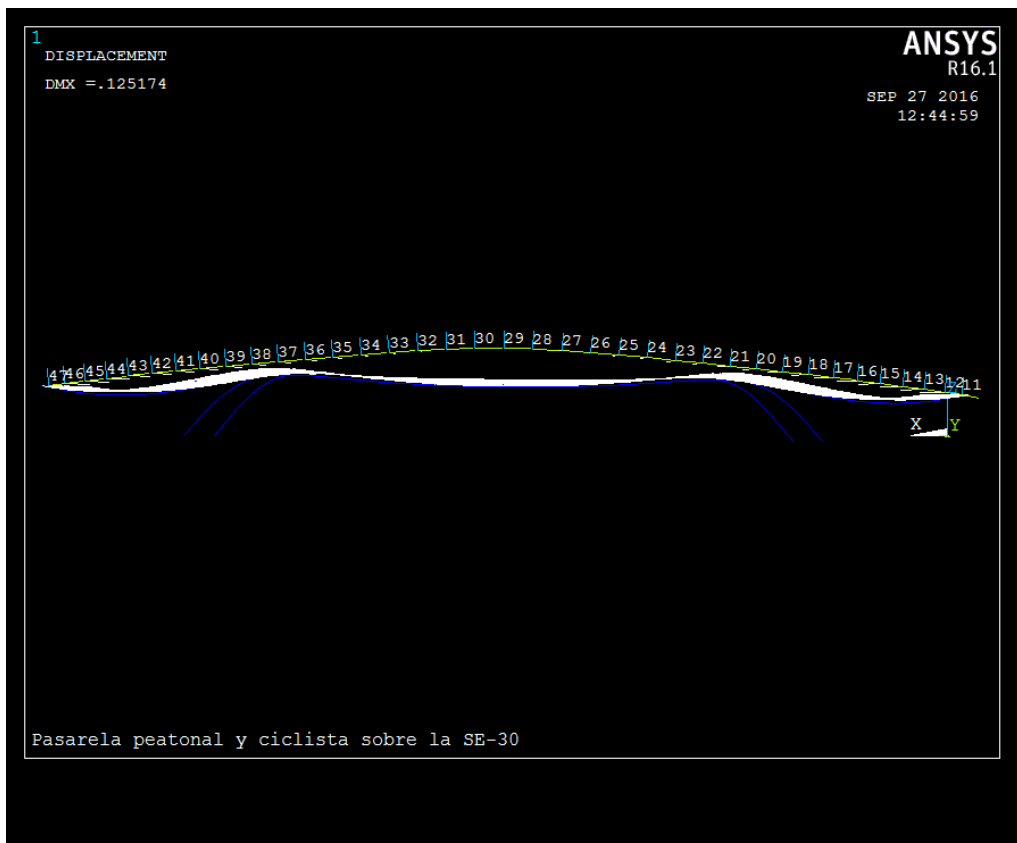
Deformada combinación 32



Deformada combinación 34

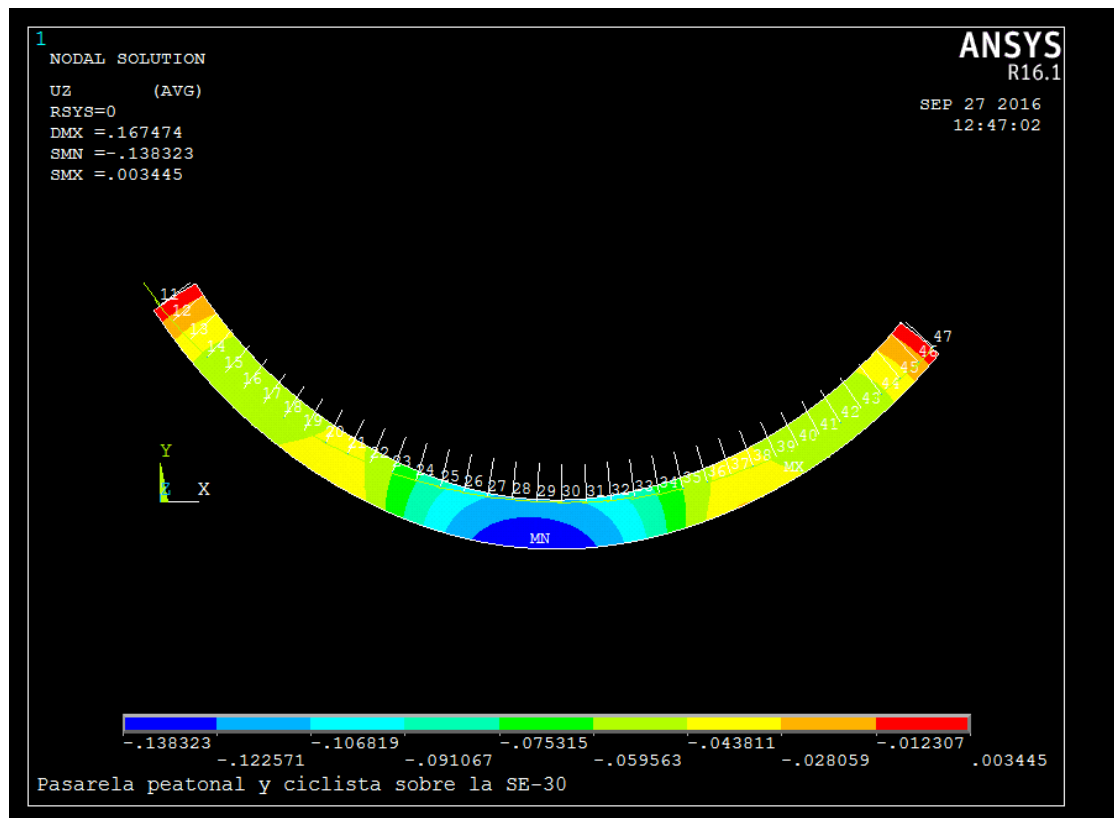


Deformada combinación 43

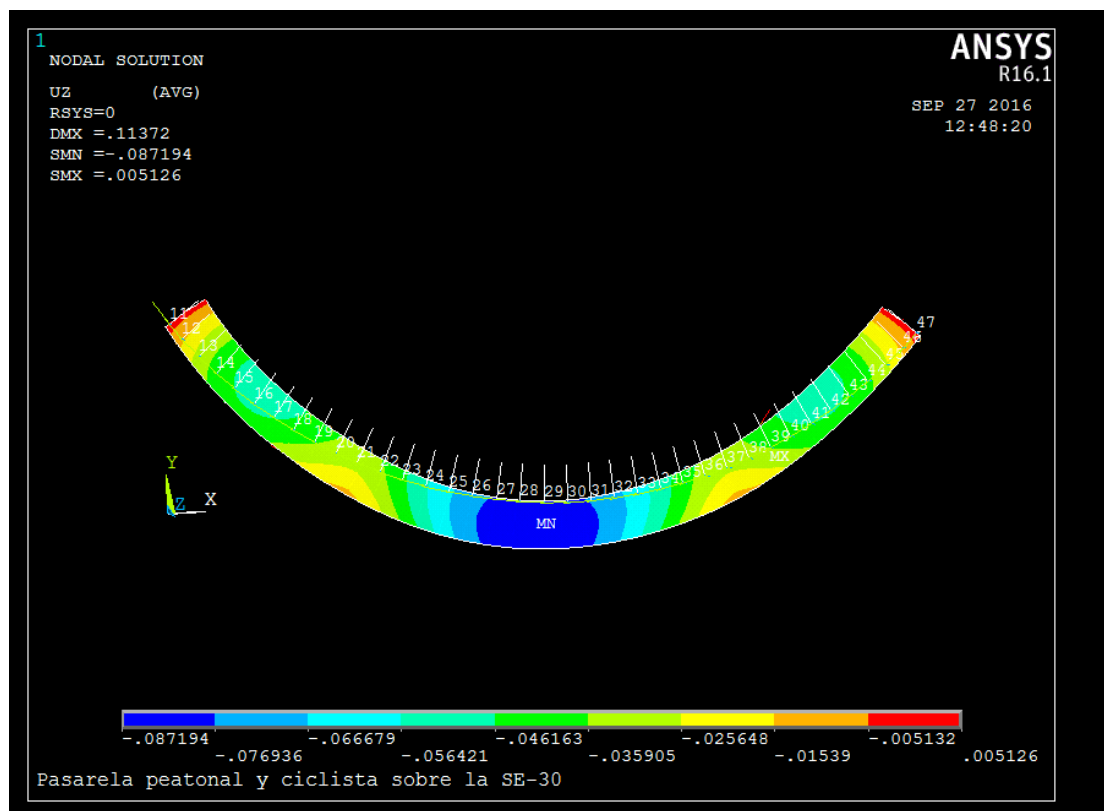


Deformada combinación 47

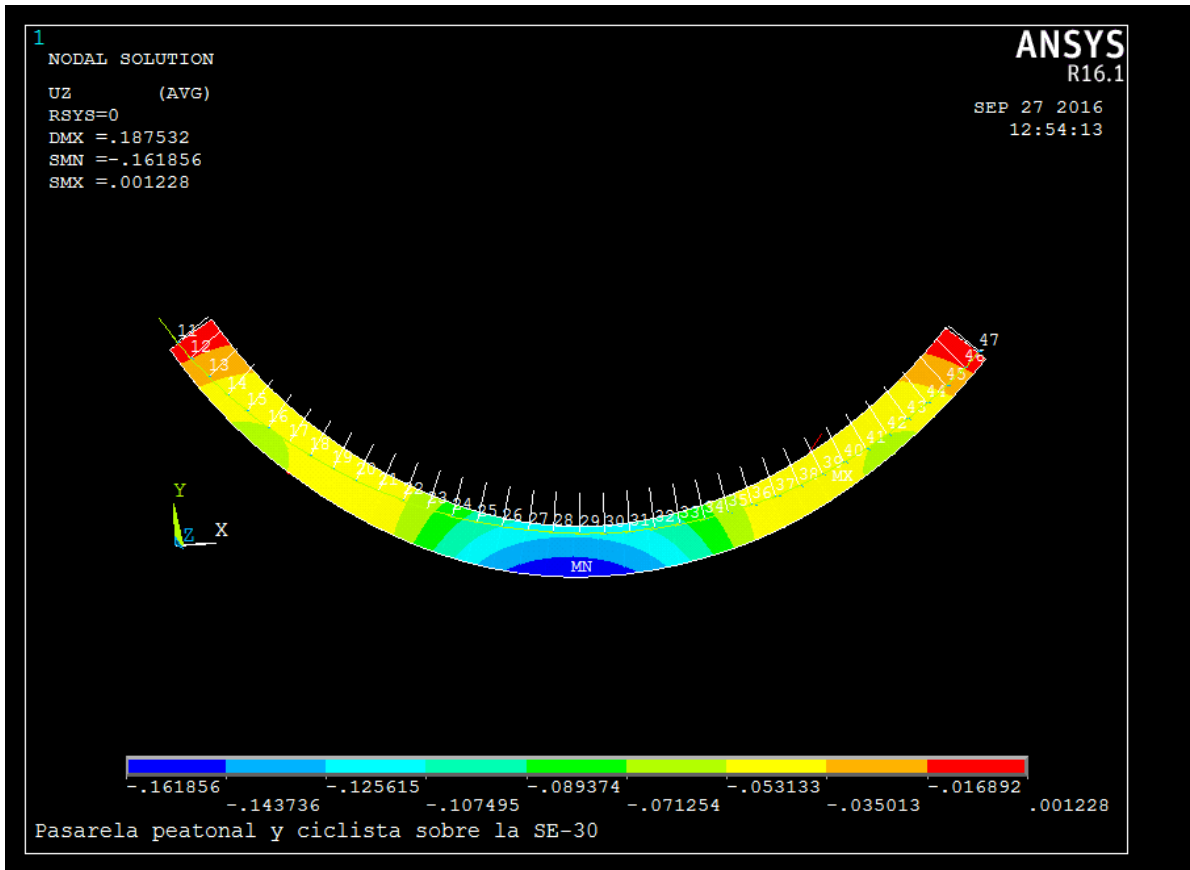
1.4 Mapas de desplazamientos



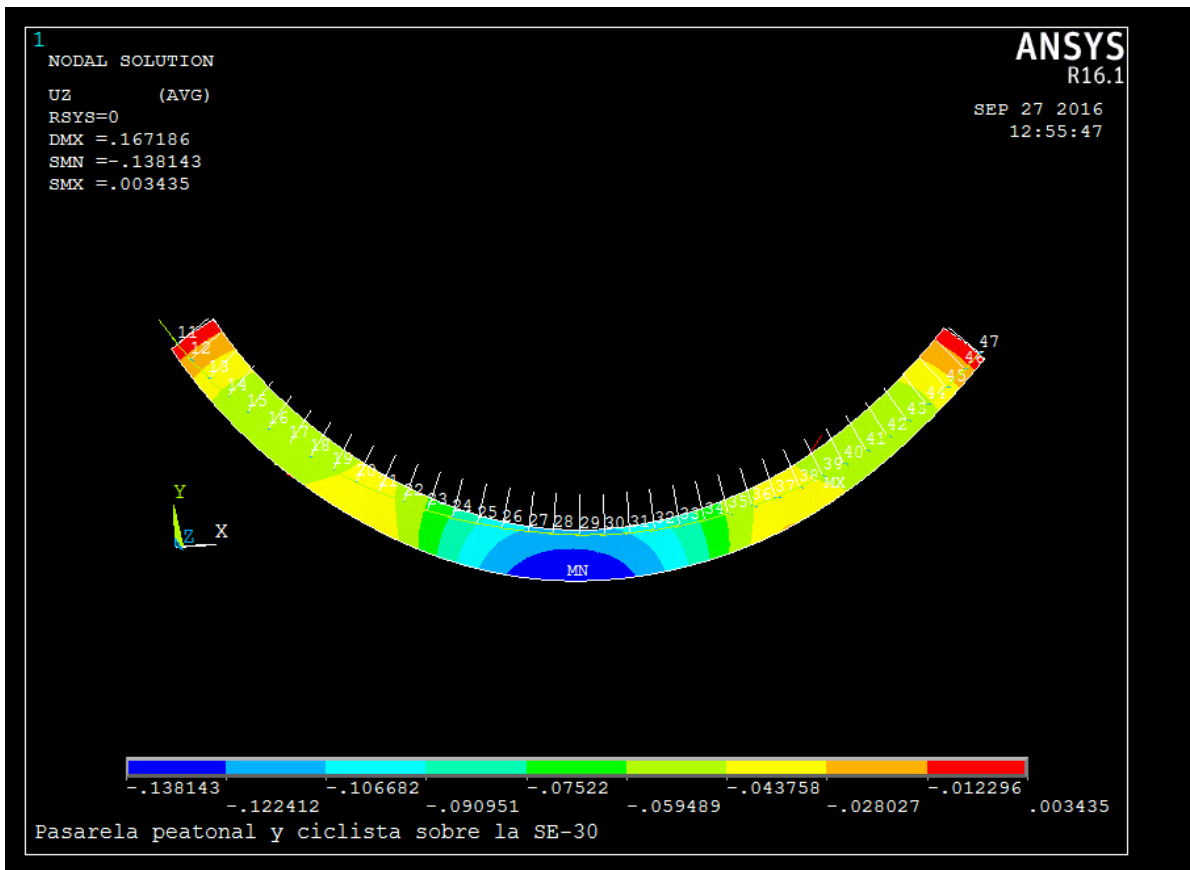
Mapa de desplazamientos 11



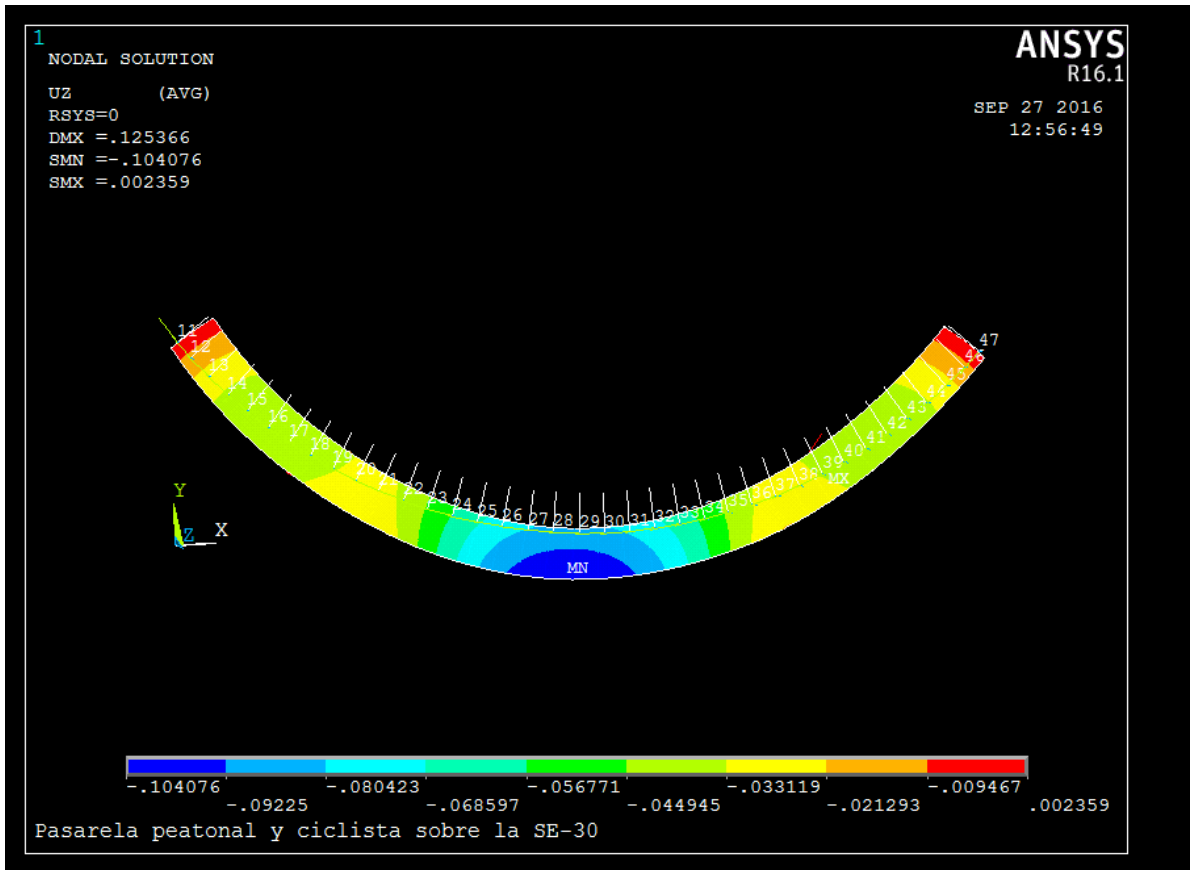
Mapa de desplazamientos 13



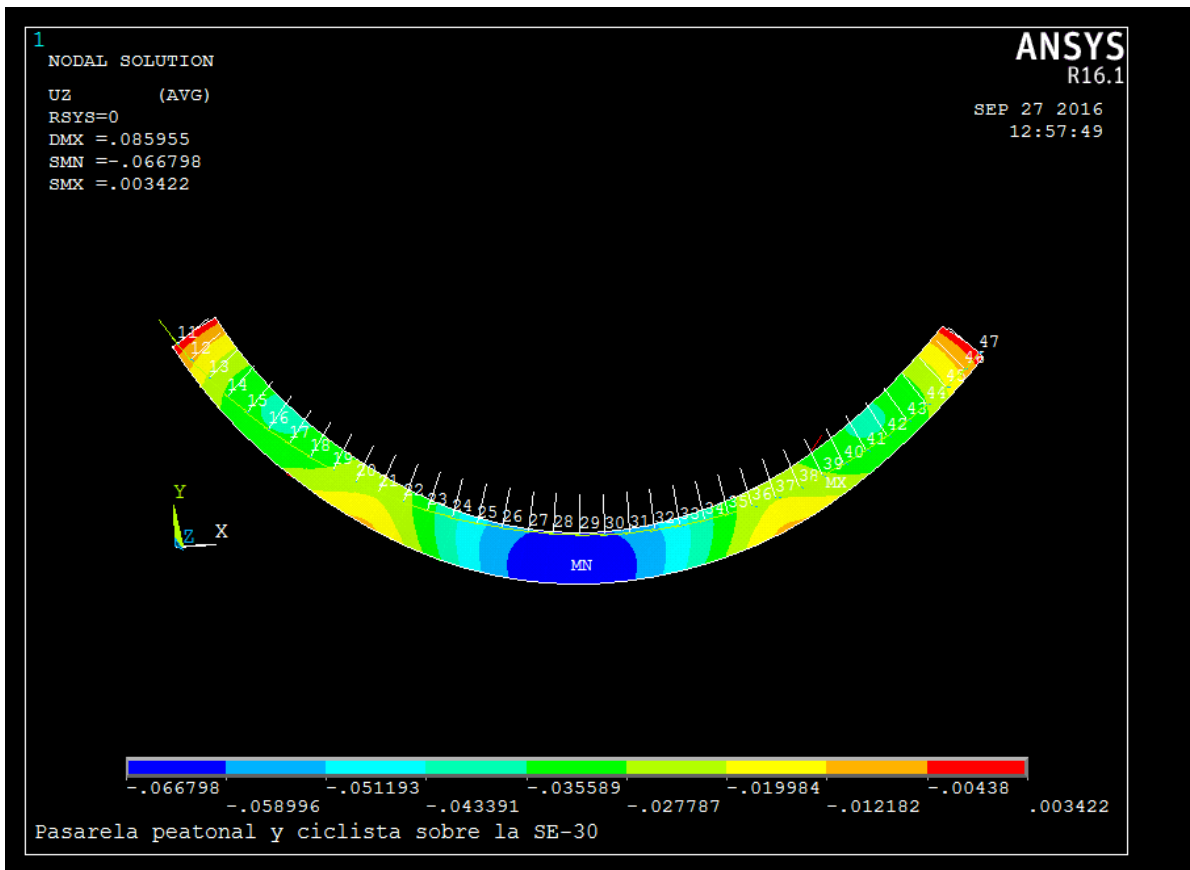
Mapa de desplazamientos 22



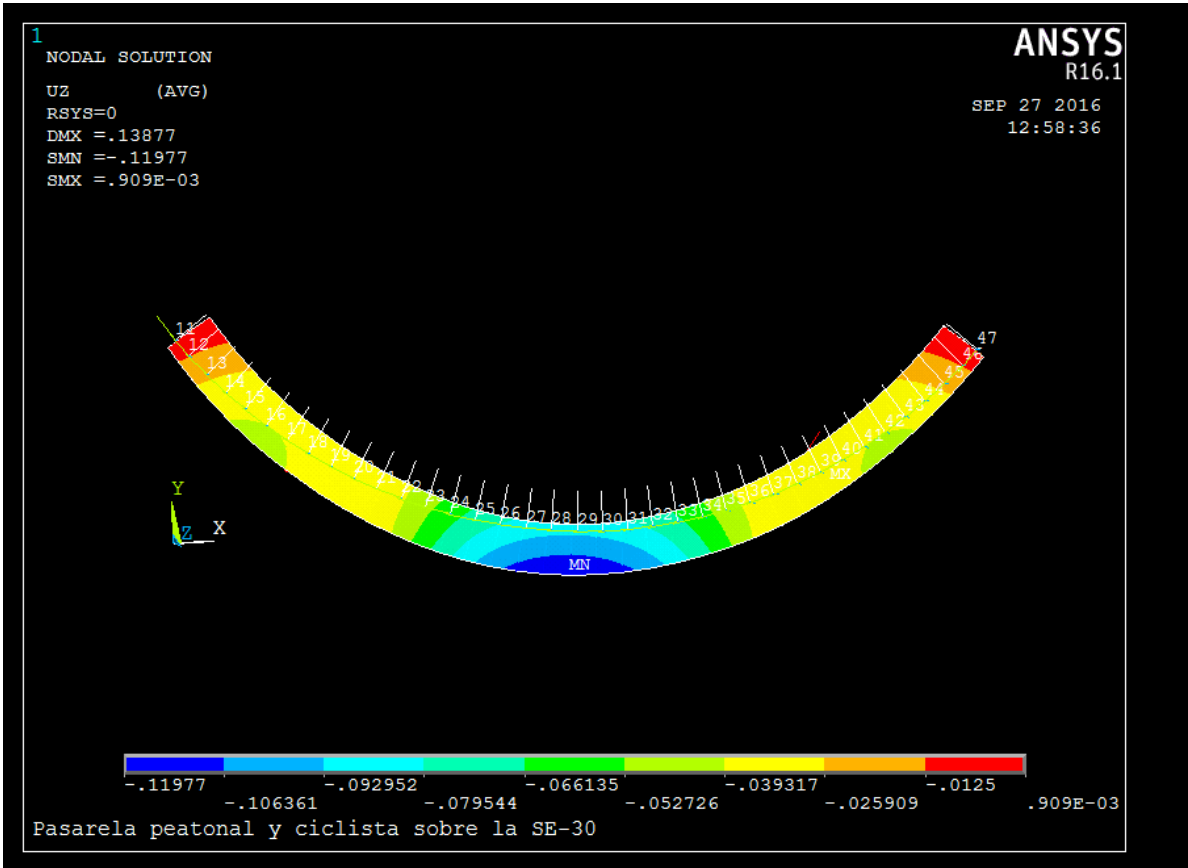
Mapa de desplazamientos 26



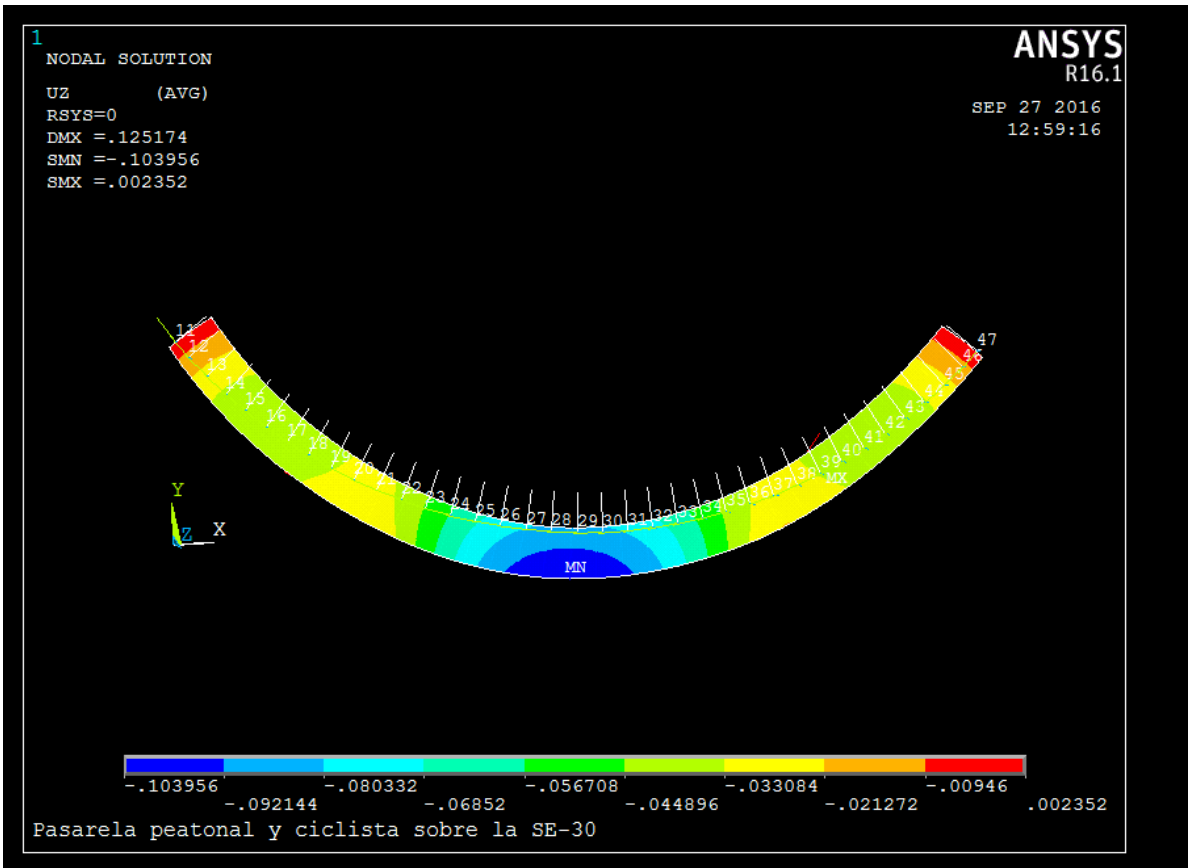
Mapa de desplazamientos 32



Mapa de desplazamientos 34

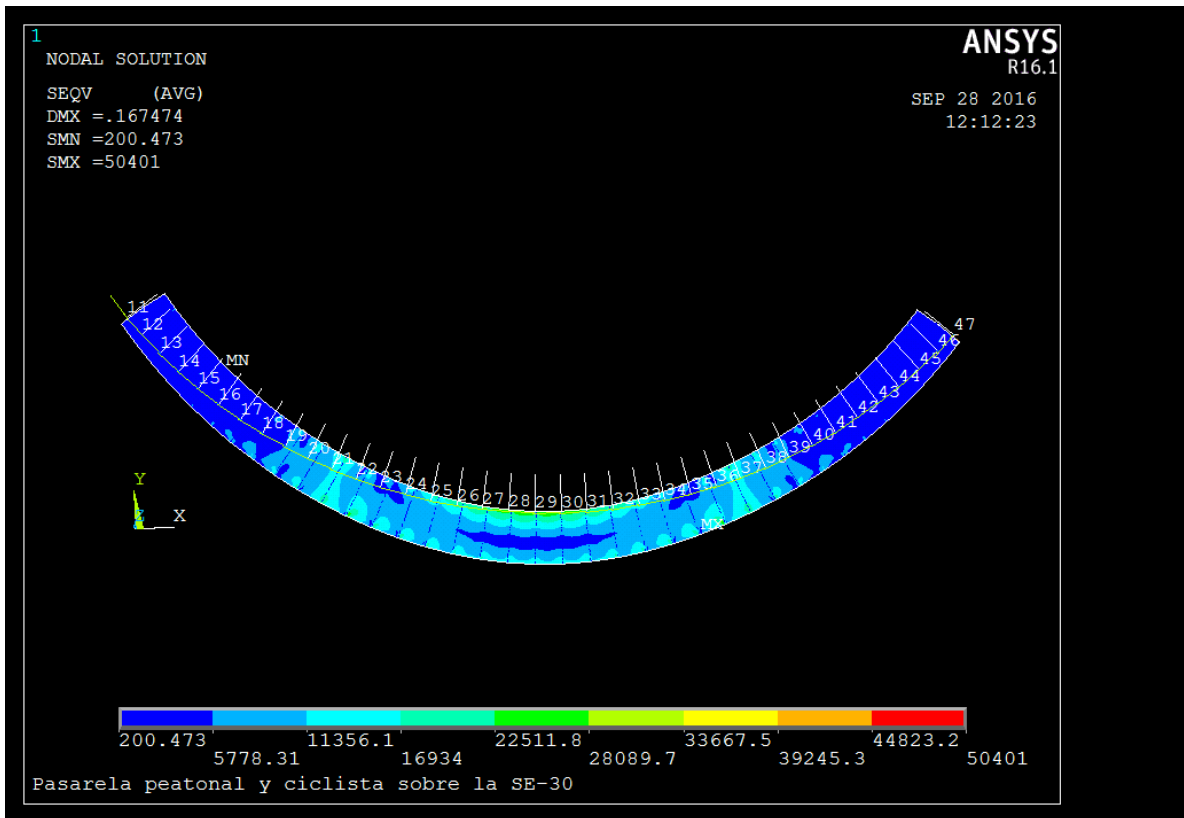


Mapa de desplazamientos 43

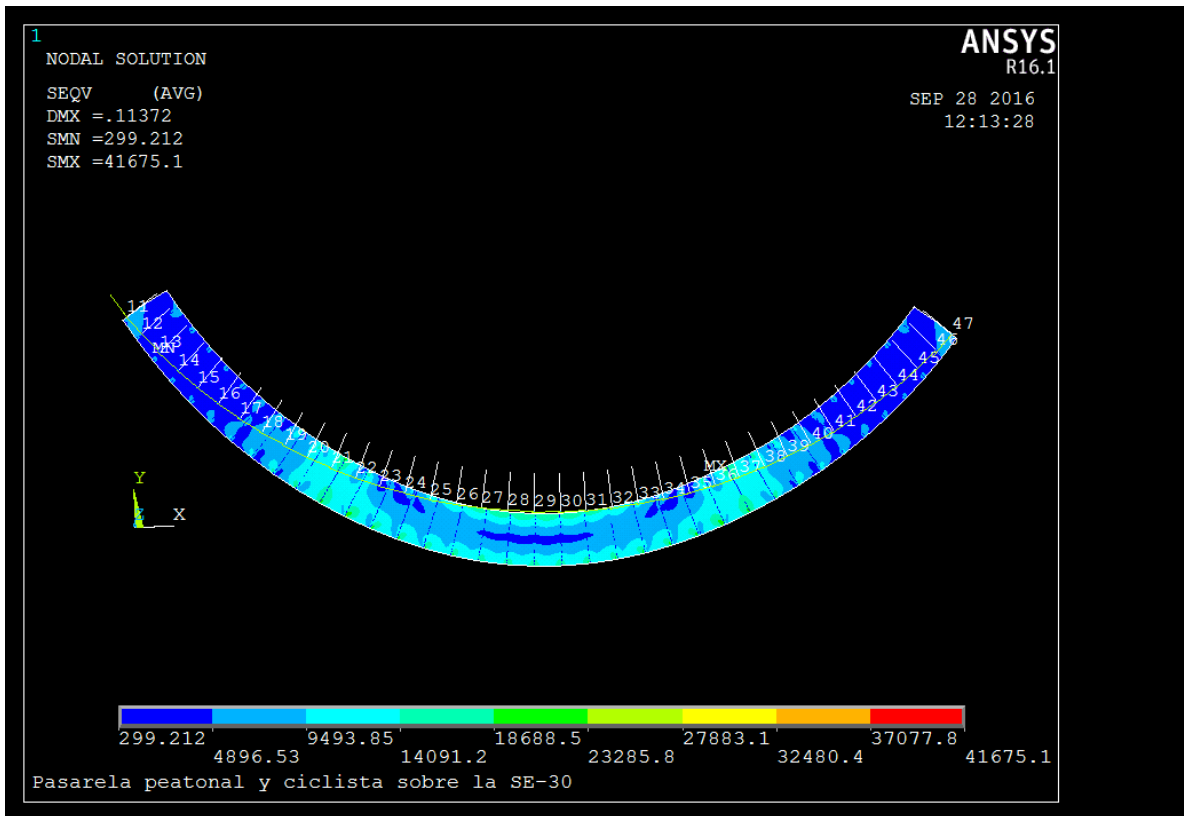


Mapa de desplazamientos 47

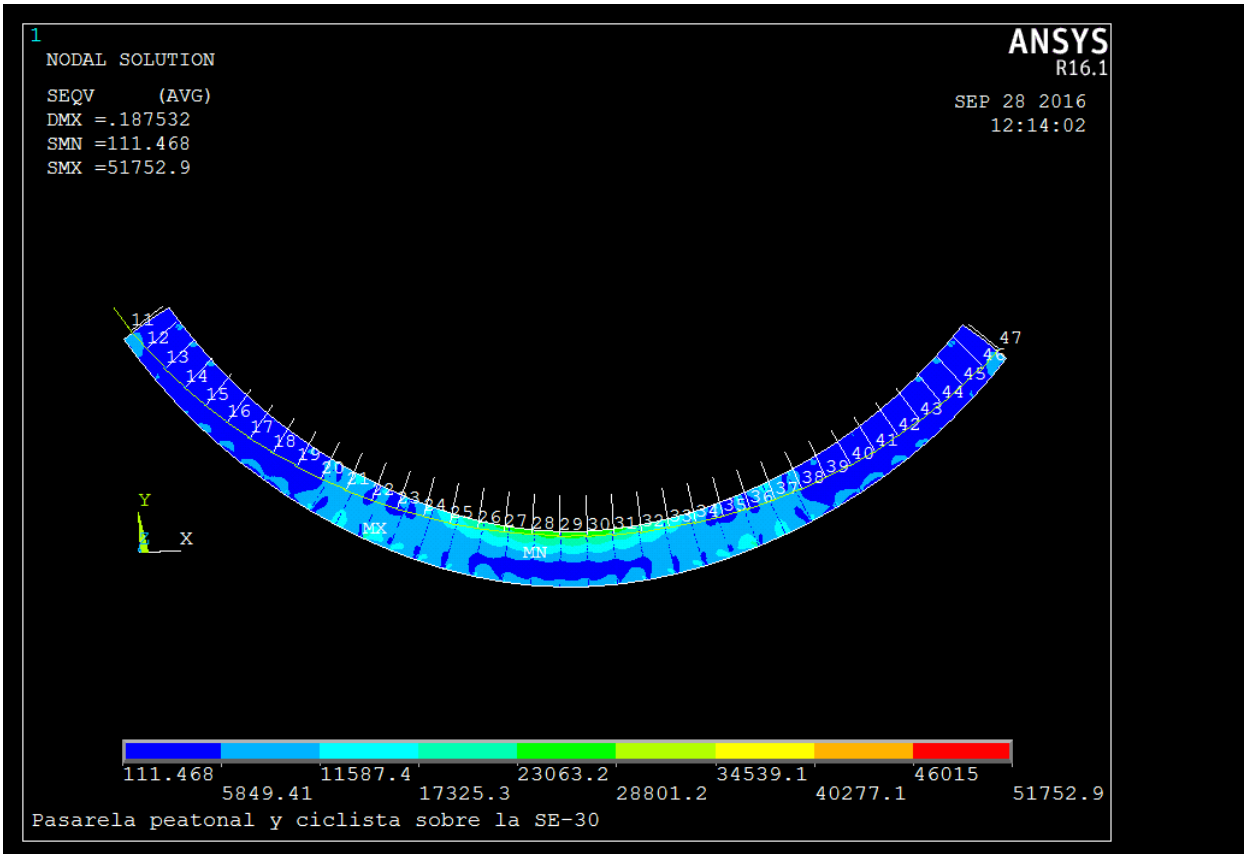
1.5 Mapas de tensiones de Von-Mises



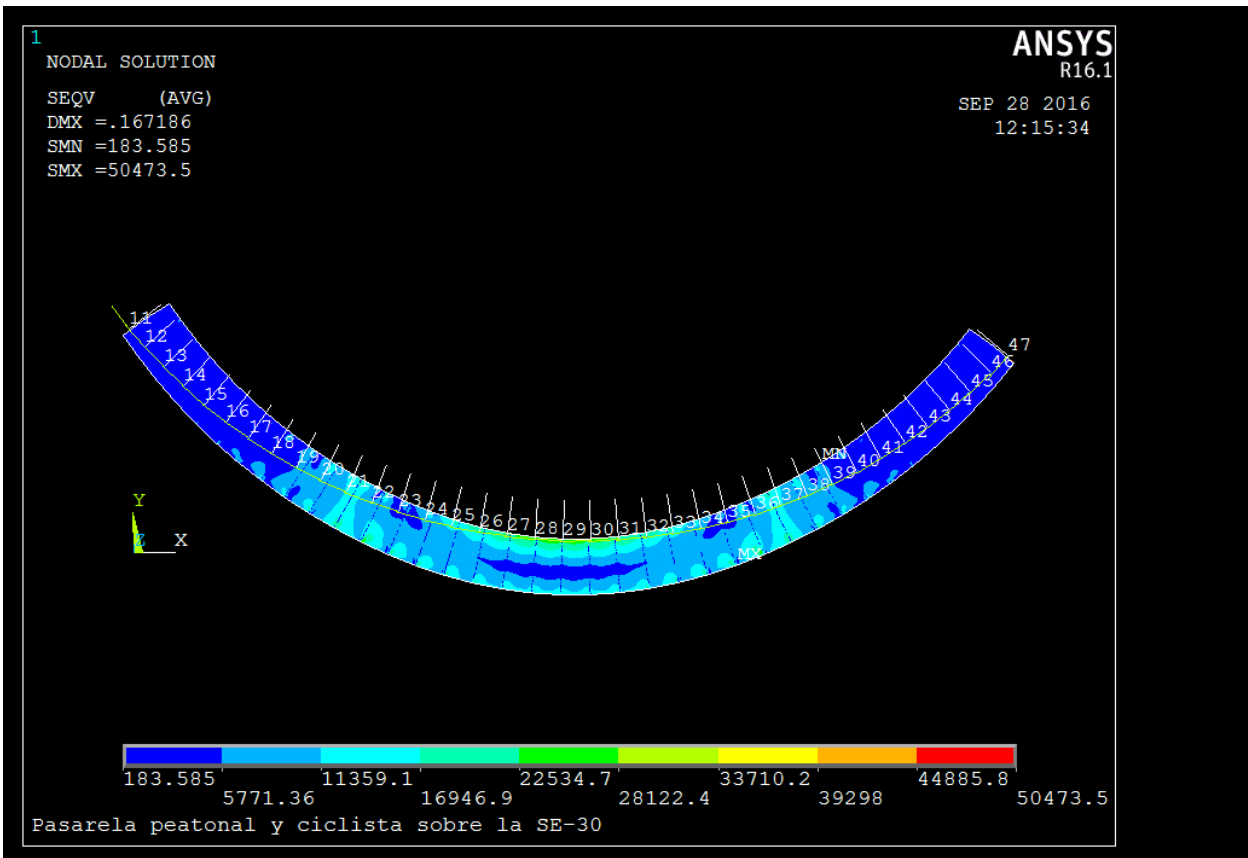
Mapa de tensiones de Von-Mises combinación 11



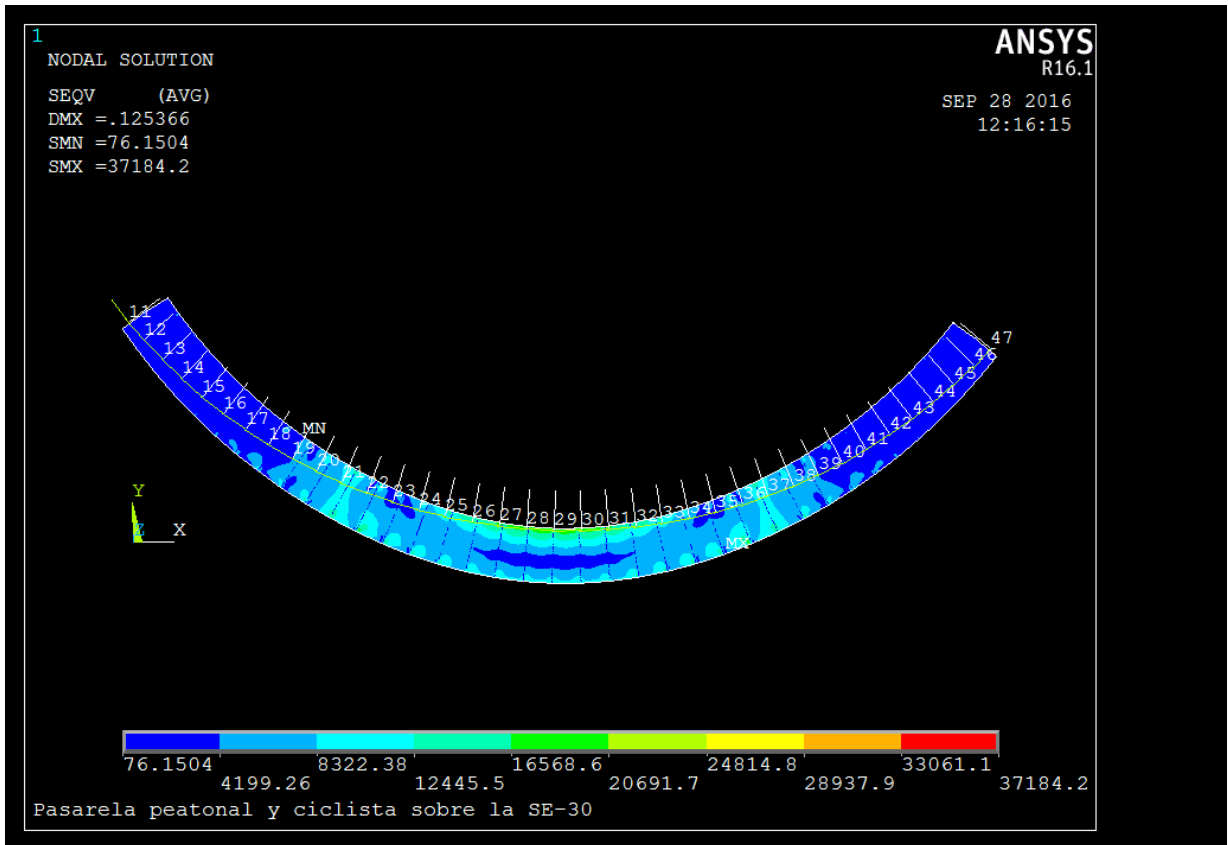
Mapa de tensiones de Von-Mises combinación 13



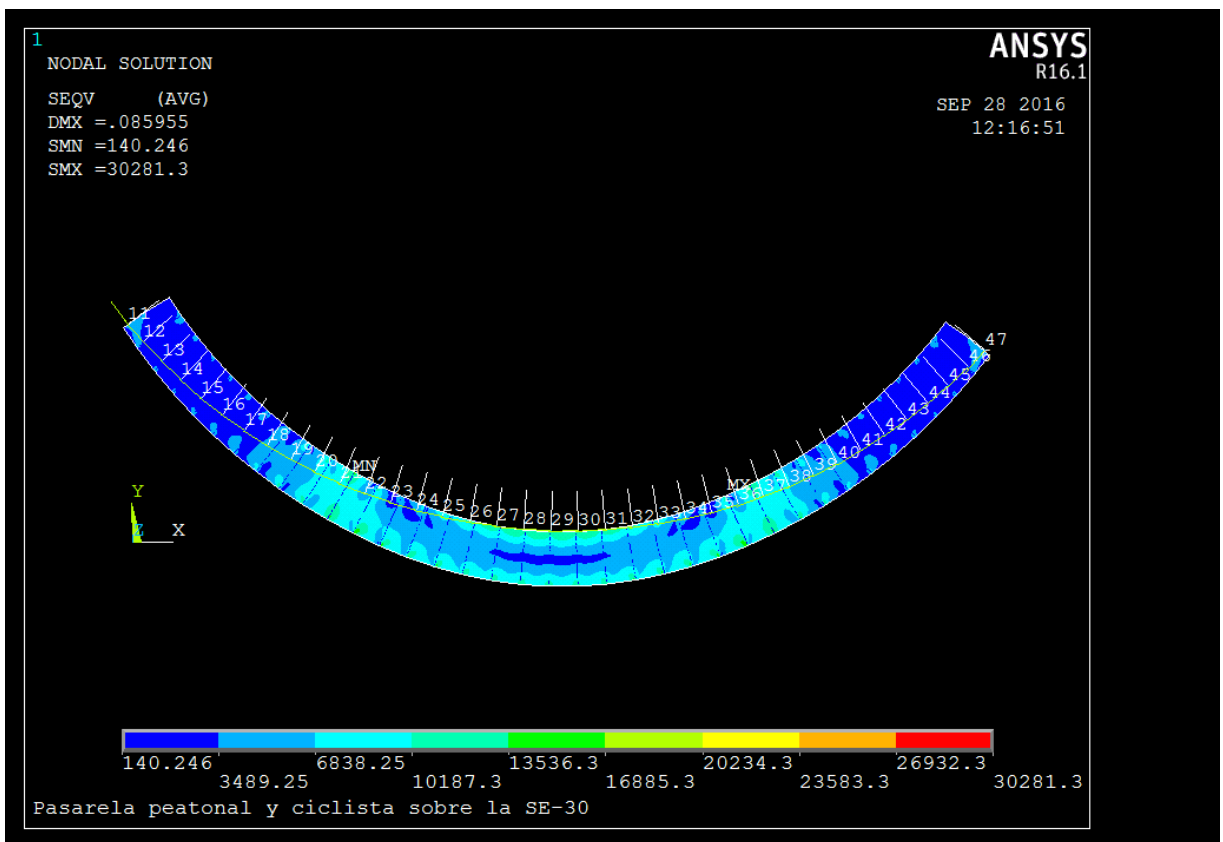
Mapa de tensiones de Von-Mises combinación 22



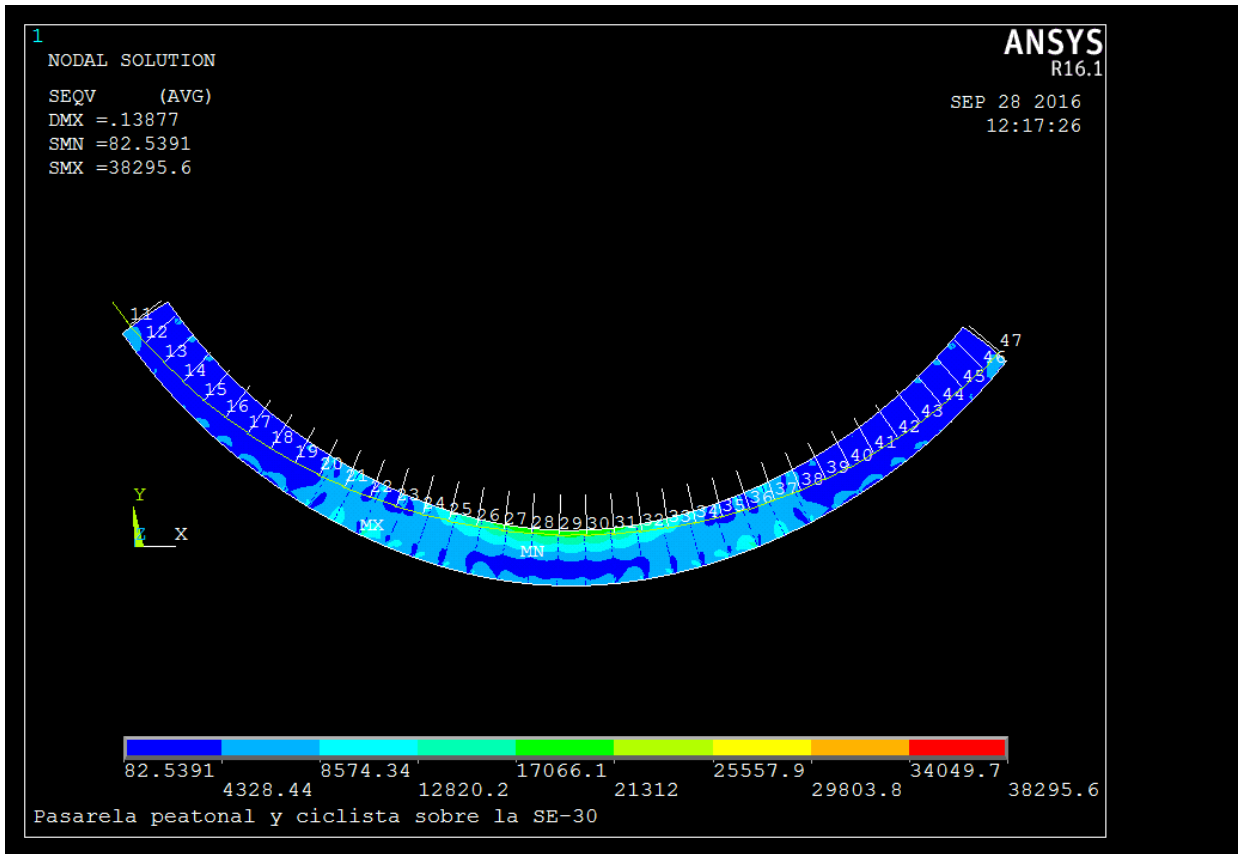
Mapa de tensiones de Von-Mises combinación 26



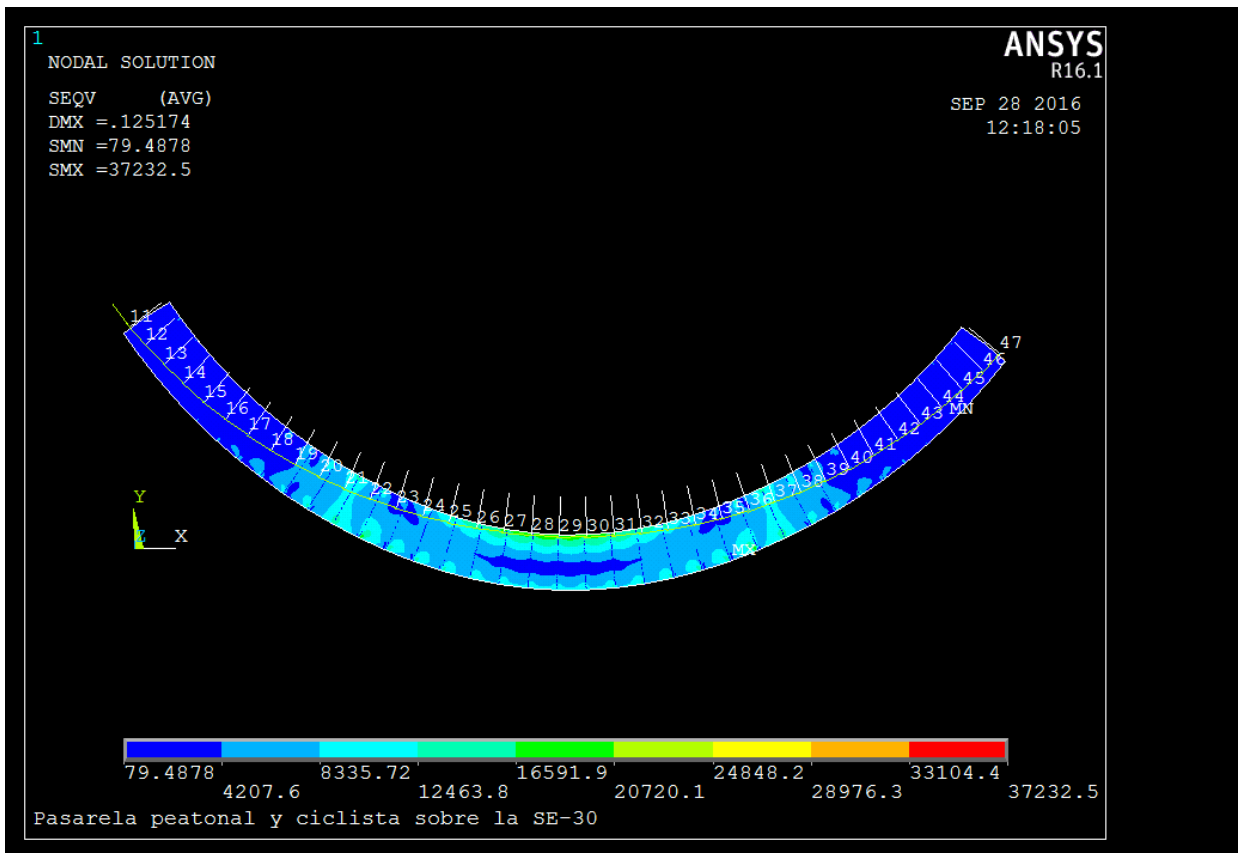
Mapa de tensiones de Von-Mises combinación 32



Mapa de tensiones de Von-Mises combinación 34



Mapa de tensiones de Von-Mises combinación 43



Mapa de tensiones de Von-Mises combinación 47

En la tabla anterior tenemos todas las reacciones y vemos las máximas de cada Keypoint:

FY			
KP	COMBINACIÓN	MAX +	MAX -
41	22	-	-1603.1
40	11	1350.1	-
55	11	1238.7	-
54	22	-	-898.04

FX			
KP	COMBINACIÓN	MAX +	MAX -
41	11	6315.9	-
40	22	-	-1261.0
55	22	1390.7	-
54	22	-	-6438.1

FZ			
KP	COMBINACIÓN	MAX +	MAX -
41	22	4994.2	-
40	22	-	-1458.9
55	22	-	-1460.2
54	22	5000.1	-
56	22	122.03	
57	34	-	-54.880
128	22	119.58	-
129	34	-	-92.490
130	22	700.75	-
166	22	702.11	-
1	13	193.82	-
39	13	203.06	-

Y por último vemos la tabla de resultados donde hemos recopilado los máximos totales:

KP	FY	FX	FZ
41	-1603.1	6315.9	4994.2
40	1350.1	-1261.0	-1458.9
55	1238.7	1390.7	-1460.2
54	-898.04	-6438.1	5000.1
56	-	-	122.03
57	-	-	-54.880
128	-	-	119.58
129	-	-	-92.490
130	-	-	700.75
166	-	-	702.11
1	-	-	193.82
39	-	-	203.06

Todos los resultados están en las unidades del SI. En este caso en kN y m.

Índice de planos

- P.01. SITUACIÓN
- P.02. CONEXIÓN DE LA RED EXISTENTE
- P.03. EMPLAZAMIENTO
- P.04. PLANTA ACTUAL
- P.05. PLANTA PROYECTADA
- P.06. PLANTA Y SECCIÓN
- P.07. PERFIL LONGITUDINAL
- P.08. DETALLES
- P.09. MODELO DIGITAL