```
--- Paso 1: Lectura de input ---
Lectura de input completada
--- Paso 2: Preprocesamiento ---
Matriz de rigidez global (S) para nudos rígidos:
   1.0e+09 *
  Columns 1 through 8
    1.0998    0.4946   -0.0019   -0.4800         0         0         0         0
    0.4946    0.3975    0.0033         0   -0.0003    0.0009         0         0
   -0.0019    0.0033    0.0118         0   -0.0009    0.0018         0         0
   -0.4800         0         0    2.1999    0.0000   -0.0045   -0.4800         0
         0   -0.0003   -0.0009    0.0000    1.2558         0         0   -0.0003
         0    0.0009    0.0018   -0.0045         0    0.0259         0   -0.0009
         0         0         0   -0.4800         0         0    2.1999    0.0000
         0         0         0         0   -0.0003   -0.0009    0.0000    1.2558
         0         0         0         0    0.0009    0.0018   -0.0045         0
         0         0         0         0         0         0   -0.4800         0
         0         0         0         0         0         0         0   -0.0003
         0         0         0         0         0         0         0    0.0009
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
   -0.6198   -0.4946    0.0019   -0.6198    0.4946    0.0019         0         0
   -0.4946   -0.3972   -0.0024    0.4946   -0.3972    0.0024         0         0
   -0.0019    0.0024    0.0041   -0.0019   -0.0024    0.0041         0         0
         0         0         0   -0.6198   -0.4946    0.0019   -0.6198    0.4946
         0         0         0   -0.4946   -0.3972   -0.0024    0.4946   -0.3972
         0         0         0   -0.0019    0.0024    0.0041   -0.0019   -0.0024
         0         0         0         0         0         0   -0.6198   -0.4946
         0         0         0         0         0         0   -0.4946   -0.3972
         0         0         0         0         0         0   -0.0019    0.0024
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0   -0.0003         0    0.0007         0         0
         0         0         0         0   -0.4608         0         0         0
         0         0         0   -0.0007         0    0.0011         0         0
```

```
       0         0         0         0         0         0   -0.0003         0
       0         0         0         0         0         0         0   -0.4608
       0         0         0         0         0         0   -0.0007         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
Columns 9 through 16
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  0.0009         0         0         0         0         0         0         0
  0.0018         0         0         0         0         0         0         0
 -0.0045   -0.4800         0         0         0         0         0         0
       0         0   -0.0003    0.0009         0         0         0         0
  0.0259         0   -0.0009    0.0018         0         0         0         0
       0    2.1999    0.0000   -0.0045   -0.4800         0         0         0
 -0.0009    0.0000    1.2558         0         0   -0.0003    0.0009         0
  0.0018   -0.0045         0    0.0259         0   -0.0009    0.0018         0
       0   -0.4800         0         0    2.1999    0.0000   -0.0045   -0.4800
       0         0   -0.0003   -0.0009    0.0000    1.2558         0         0
       0         0    0.0009    0.0018   -0.0045         0    0.0259         0
       0         0         0         0   -0.4800         0         0    2.1999
       0         0         0         0         0   -0.0003   -0.0009    0.0000
       0         0         0         0         0    0.0009    0.0018   -0.0045
       0         0         0         0         0         0         0   -0.4800
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  0.0019         0         0         0         0         0         0         0
  0.0024         0         0         0         0         0         0         0
  0.0041         0         0         0         0         0         0         0
  0.0019   -0.6198    0.4946    0.0019         0         0         0         0
 -0.0024    0.4946   -0.3972    0.0024         0         0         0         0
  0.0041   -0.0019   -0.0024    0.0041         0         0         0         0
       0   -0.6198   -0.4946    0.0019   -0.6198    0.4946    0.0019         0
       0   -0.4946   -0.3972   -0.0024    0.4946   -0.3972    0.0024         0
       0   -0.0019    0.0024    0.0041   -0.0019   -0.0024    0.0041         0
       0         0         0         0   -0.6198   -0.4946    0.0019   -0.6198
       0         0         0         0   -0.4946   -0.3972   -0.0024    0.4946
```

```
       0         0         0         0   -0.0019    0.0024    0.0041   -0.0019
       0         0         0         0         0         0         0   -0.6198
       0         0         0         0         0         0         0   -0.4946
       0         0         0         0         0         0         0   -0.0019
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  0.0007         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  0.0011         0         0         0         0         0         0         0
       0   -0.0003         0    0.0007         0         0         0         0
       0         0   -0.4608         0         0         0         0         0
       0   -0.0007         0    0.0011         0         0         0         0
       0         0         0         0   -0.0003         0    0.0007         0
       0         0         0         0         0   -0.4608         0         0
       0         0         0         0   -0.0007         0    0.0011         0
       0         0         0         0         0         0         0   -0.0003
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0   -0.0007
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
Columns 17 through 24
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
 -0.0003    0.0009         0         0         0         0         0         0
 -0.0009    0.0018         0         0         0         0         0         0
  0.0000   -0.0045   -0.4800         0         0         0         0         0
  1.2558         0         0   -0.0003    0.0009         0         0         0
       0    0.0259         0   -0.0009    0.0018         0         0         0
       0         0    2.1999    0.0000   -0.0045   -0.4800         0         0
 -0.0003   -0.0009    0.0000    1.2558         0         0   -0.0003    0.0009
  0.0009    0.0018   -0.0045         0    0.0259         0   -0.0009    0.0018
       0         0   -0.4800         0         0    2.1999    0.0000   -0.0045
       0         0         0   -0.0003   -0.0009    0.0000    1.2558         0
       0         0         0    0.0009    0.0018   -0.0045         0    0.0259
       0         0         0         0         0   -0.4800         0         0
       0         0         0         0         0         0   -0.0003   -0.0009
       0         0         0         0         0         0    0.0009    0.0018
       0         0         0         0         0         0         0         0
```

```
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  0.4946    0.0019         0         0         0         0         0         0
 -0.3972    0.0024         0         0         0         0         0         0
 -0.0024    0.0041         0         0         0         0         0         0
 -0.4946    0.0019   -0.6198    0.4946    0.0019         0         0         0
 -0.3972   -0.0024    0.4946   -0.3972    0.0024         0         0         0
  0.0024    0.0041   -0.0019   -0.0024    0.0041         0         0         0
       0         0   -0.6198   -0.4946    0.0019   -0.6198    0.4946    0.0019
       0         0   -0.4946   -0.3972   -0.0024    0.4946   -0.3972    0.0024
       0         0   -0.0019    0.0024    0.0041   -0.0019   -0.0024    0.0041
       0         0         0         0         0   -0.6198   -0.4946    0.0019
       0         0         0         0         0   -0.4946   -0.3972   -0.0024
       0         0         0         0         0   -0.0019    0.0024    0.0041
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0    0.0007         0         0         0         0         0         0
 -0.4608         0         0         0         0         0         0         0
       0    0.0011         0         0         0         0         0         0
       0         0   -0.0003         0    0.0007         0         0         0
       0         0         0   -0.4608         0         0         0         0
       0         0   -0.0007         0    0.0011         0         0         0
       0         0         0         0         0   -0.0003         0    0.0007
       0         0         0         0         0         0   -0.4608         0
       0         0         0         0         0   -0.0007         0    0.0011
Columns 25 through 32
       0         0         0   -0.6198   -0.4946   -0.0019         0         0
       0         0         0   -0.4946   -0.3972    0.0024         0         0
       0         0         0    0.0019   -0.0024    0.0041         0         0
       0         0         0   -0.6198    0.4946   -0.0019   -0.6198   -0.4946
       0         0         0    0.4946   -0.3972   -0.0024   -0.4946   -0.3972
       0         0         0    0.0019    0.0024    0.0041    0.0019   -0.0024
       0         0         0         0         0         0   -0.6198    0.4946
       0         0         0         0         0         0    0.4946   -0.3972
       0         0         0         0         0         0    0.0019    0.0024
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
```

```
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
 -0.4800         0         0         0         0         0         0         0
      0   -0.0003    0.0009         0         0         0         0         0
      0   -0.0009    0.0018         0         0         0         0         0
 1.0998   -0.4946   -0.0019         0         0         0         0         0
-0.4946    0.3975   -0.0033         0         0         0         0         0
-0.0019   -0.0033    0.0118         0         0         0         0         0
      0         0         0    1.8594    0.4946    0.0019         0         0
      0         0         0    0.4946    1.1917    0.0024         0         0
      0         0         0    0.0019    0.0024    0.0247         0         0
      0         0         0         0         0         0    2.4792    0.0000
      0         0         0         0         0         0    0.0000    1.5889
      0         0         0         0         0         0   -0.0000         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
 -0.6198    0.4946    0.0019         0         0         0         0         0
  0.4946   -0.3972    0.0024         0         0         0         0         0
 -0.0019   -0.0024    0.0041         0         0         0         0         0
      0         0         0   -0.6198   -0.4946    0.0019   -0.6198    0.4946
      0         0         0   -0.4946   -0.3972   -0.0024    0.4946   -0.3972
      0         0         0   -0.0019    0.0024    0.0041   -0.0019   -0.0024
      0         0         0         0         0         0   -0.6198   -0.4946
      0         0         0         0         0         0   -0.4946   -0.3972
      0         0         0         0         0         0   -0.0019    0.0024
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
Columns 33 through 40
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
```

```
         0         0         0         0         0         0         0         0
   -0.0019         0         0         0         0         0         0         0
    0.0024         0         0         0         0         0         0         0
    0.0041         0         0         0         0         0         0         0
   -0.0019   -0.6198   -0.4946   -0.0019         0         0         0         0
   -0.0024   -0.4946   -0.3972    0.0024         0         0         0         0
    0.0041    0.0019   -0.0024    0.0041         0         0         0         0
         0   -0.6198    0.4946   -0.0019   -0.6198   -0.4946   -0.0019         0
         0    0.4946   -0.3972   -0.0024   -0.4946   -0.3972    0.0024         0
         0    0.0019    0.0024    0.0041    0.0019   -0.0024    0.0041         0
         0         0         0         0   -0.6198    0.4946   -0.0019   -0.6198
         0         0         0         0    0.4946   -0.3972   -0.0024   -0.4946
         0         0         0         0    0.0019    0.0024    0.0041    0.0019
         0         0         0         0         0         0         0   -0.6198
         0         0         0         0         0         0         0    0.4946
         0         0         0         0         0         0         0    0.0019
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
   -0.0000         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
    0.0330         0         0         0         0         0         0         0
         0    2.4792    0.0000   -0.0000         0         0         0         0
         0    0.0000    1.5889         0         0         0         0         0
         0   -0.0000         0    0.0330         0         0         0         0
         0         0         0         0    2.4792    0.0000   -0.0000         0
         0         0         0         0    0.0000    1.5889         0         0
         0         0         0         0   -0.0000         0    0.0330         0
         0         0         0         0         0         0         0    2.4792
         0         0         0         0         0         0         0    0.0000
         0         0         0         0         0         0         0   -0.0000
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
    0.0019         0         0         0         0         0         0         0
    0.0024         0         0         0         0         0         0         0
    0.0041         0         0         0         0         0         0         0
    0.0019   -0.6198    0.4946    0.0019         0         0         0         0
   -0.0024    0.4946   -0.3972    0.0024         0         0         0         0
    0.0041   -0.0019   -0.0024    0.0041         0         0         0         0
         0   -0.6198   -0.4946    0.0019   -0.6198    0.4946    0.0019         0
         0   -0.4946   -0.3972   -0.0024    0.4946   -0.3972    0.0024         0
         0   -0.0019    0.0024    0.0041   -0.0019   -0.0024    0.0041         0
         0         0         0         0   -0.6198   -0.4946    0.0019   -0.6198
         0         0         0         0   -0.4946   -0.3972   -0.0024    0.4946
```

```
       0         0         0         0   -0.0019    0.0024    0.0041   -0.0019
       0         0         0         0         0         0         0   -0.6198
       0         0         0         0         0         0         0   -0.4946
       0         0         0         0         0         0         0   -0.0019
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
Columns 41 through 48
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  -0.4946   -0.0019         0         0         0         0         0         0
  -0.3972    0.0024         0         0         0         0         0         0
  -0.0024    0.0041         0         0         0         0         0         0
   0.4946   -0.0019   -0.6198   -0.4946   -0.0019         0         0         0
  -0.3972   -0.0024   -0.4946   -0.3972    0.0024         0         0         0
   0.0024    0.0041    0.0019   -0.0024    0.0041         0         0         0
       0         0   -0.6198    0.4946   -0.0019   -0.6198   -0.4946   -0.0019
       0         0    0.4946   -0.3972   -0.0024   -0.4946   -0.3972    0.0024
       0         0    0.0019    0.0024    0.0041    0.0019   -0.0024    0.0041
       0         0         0         0         0   -0.6198    0.4946   -0.0019
       0         0         0         0         0    0.4946   -0.3972   -0.0024
       0         0         0         0         0    0.0019    0.0024    0.0041
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  0.0000   -0.0000         0         0         0         0         0         0
  1.5889         0         0         0         0         0         0         0
       0    0.0330         0         0         0         0         0         0
       0         0    2.4792    0.0000   -0.0000         0         0         0
       0         0    0.0000    1.5889         0         0         0         0
       0         0   -0.0000         0    0.0330         0         0         0
       0         0         0         0         0    2.4792    0.0000   -0.0000
       0         0         0         0         0    0.0000    1.5889         0
       0         0         0         0         0   -0.0000         0    0.0330
       0         0         0         0         0         0         0         0
```

```
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  0.4946    0.0019         0         0         0         0         0         0
 -0.3972    0.0024         0         0         0         0         0         0
 -0.0024    0.0041         0         0         0         0         0         0
 -0.4946    0.0019   -0.6198    0.4946    0.0019         0         0         0
 -0.3972   -0.0024    0.4946   -0.3972    0.0024         0         0         0
  0.0024    0.0041   -0.0019   -0.0024    0.0041         0         0         0
       0         0   -0.6198   -0.4946    0.0019   -0.6198    0.4946    0.0019
       0         0   -0.4946   -0.3972   -0.0024    0.4946   -0.3972    0.0024
       0         0   -0.0019    0.0024    0.0041   -0.0019   -0.0024    0.0041
       0         0         0         0         0   -0.6198   -0.4946    0.0019
       0         0         0         0         0   -0.4946   -0.3972   -0.0024
       0         0         0         0         0   -0.0019    0.0024    0.0041
Columns 49 through 56
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0   -0.0003         0   -0.0007         0         0
       0         0         0         0   -0.4608         0         0         0
       0         0         0    0.0007         0    0.0011         0         0
       0         0         0         0         0         0   -0.0003         0
       0         0         0         0         0         0         0   -0.4608
       0         0         0         0         0         0    0.0007         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  -0.6198   -0.4946   -0.0019         0         0         0         0         0
  -0.4946   -0.3972    0.0024         0         0         0         0         0
   0.0019   -0.0024    0.0041         0         0         0         0         0
  -0.6198    0.4946   -0.0019         0         0         0         0         0
   0.4946   -0.3972   -0.0024         0         0         0         0         0
   0.0019    0.0024    0.0041         0         0         0         0         0
       0         0         0   -0.6198   -0.4946   -0.0019         0         0
       0         0         0   -0.4946   -0.3972    0.0024         0         0
       0         0         0    0.0019   -0.0024    0.0041         0         0
       0         0         0   -0.6198    0.4946   -0.0019   -0.6198   -0.4946
       0         0         0    0.4946   -0.3972   -0.0024   -0.4946   -0.3972
       0         0         0    0.0019    0.0024    0.0041    0.0019   -0.0024
       0         0         0         0         0         0   -0.6198    0.4946
       0         0         0         0         0         0    0.4946   -0.3972
       0         0         0         0         0         0    0.0019    0.0024
```

```
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  1.8594   -0.4946    0.0019         0         0         0         0         0
 -0.4946    1.1917   -0.0024         0         0         0         0         0
  0.0019   -0.0024    0.0247         0         0         0         0         0
       0         0         0    1.7199    0.0000    0.0045   -0.4800         0
       0         0         0    0.0000    1.2555    0.0009         0   -0.0003
       0         0         0    0.0045    0.0009    0.0223         0   -0.0009
       0         0         0   -0.4800         0         0    2.1999    0.0000
       0         0         0         0   -0.0003   -0.0009    0.0000    1.2558
       0         0         0         0    0.0009    0.0018    0.0045         0
       0         0         0         0         0         0   -0.4800         0
       0         0         0         0         0         0         0   -0.0003
       0         0         0         0         0         0         0    0.0009
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  -0.6198    0.4946    0.0019         0         0         0         0         0
   0.4946   -0.3972    0.0024         0         0         0         0         0
  -0.0019   -0.0024    0.0041         0         0         0         0         0
Columns 57 through 64
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  -0.0007         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
   0.0011         0         0         0         0         0         0         0
       0   -0.0003         0   -0.0007         0         0         0         0
       0         0   -0.4608         0         0         0         0         0
       0    0.0007         0    0.0011         0         0         0         0
       0         0         0         0   -0.0003         0   -0.0007         0
       0         0         0         0         0   -0.4608         0         0
       0         0         0         0    0.0007         0    0.0011         0
       0         0         0         0         0         0         0   -0.0003
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0    0.0007
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
```

```
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
  -0.0019         0         0         0         0         0         0         0
   0.0024         0         0         0         0         0         0         0
   0.0041         0         0         0         0         0         0         0
  -0.0019   -0.6198   -0.4946   -0.0019         0         0         0         0
  -0.0024   -0.4946   -0.3972    0.0024         0         0         0         0
   0.0041    0.0019   -0.0024    0.0041         0         0         0         0
       0   -0.6198    0.4946   -0.0019   -0.6198   -0.4946   -0.0019         0
       0    0.4946   -0.3972   -0.0024   -0.4946   -0.3972    0.0024         0
       0    0.0019    0.0024    0.0041    0.0019   -0.0024    0.0041         0
       0         0         0         0   -0.6198    0.4946   -0.0019   -0.6198
       0         0         0         0    0.4946   -0.3972   -0.0024   -0.4946
       0         0         0         0    0.0019    0.0024    0.0041    0.0019
       0         0         0         0         0         0         0   -0.6198
       0         0         0         0         0         0         0    0.4946
       0         0         0         0         0         0         0    0.0019
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
   0.0009         0         0         0         0         0         0         0
   0.0018         0         0         0         0         0         0         0
   0.0045   -0.4800         0         0         0         0         0         0
       0         0   -0.0003    0.0009         0         0         0         0
   0.0259         0   -0.0009    0.0018         0         0         0         0
       0    2.1999    0.0000    0.0045   -0.4800         0         0         0
  -0.0009    0.0000    1.2558         0         0   -0.0003    0.0009         0
   0.0018    0.0045         0    0.0259         0   -0.0009    0.0018         0
       0   -0.4800         0         0    2.1999    0.0000    0.0045   -0.4800
       0         0   -0.0003   -0.0009    0.0000    1.2558         0         0
       0         0    0.0009    0.0018    0.0045         0    0.0259         0
       0         0         0         0   -0.4800         0         0    2.1999
       0         0         0         0         0   -0.0003   -0.0009    0.0000
       0         0         0         0         0    0.0009    0.0018    0.0045
       0         0         0         0         0         0         0   -0.4800
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
Columns 65 through 72
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
       0         0         0         0         0         0         0         0
```

```
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0   -0.0007         0         0         0         0         0         0
-0.4608         0         0         0         0         0         0         0
      0    0.0011         0         0         0         0         0         0
      0         0   -0.0003         0   -0.0007         0         0         0
      0         0         0   -0.4608         0         0         0         0
      0         0    0.0007         0    0.0011         0         0         0
      0         0         0         0         0   -0.0003         0   -0.0007
      0         0         0         0         0         0   -0.4608         0
      0         0         0         0         0    0.0007         0    0.0011
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
-0.4946   -0.0019         0         0         0         0         0         0
-0.3972    0.0024         0         0         0         0         0         0
-0.0024    0.0041         0         0         0         0         0         0
 0.4946   -0.0019   -0.6198   -0.4946   -0.0019         0         0         0
-0.3972   -0.0024   -0.4946   -0.3972    0.0024         0         0         0
 0.0024    0.0041    0.0019   -0.0024    0.0041         0         0         0
      0         0   -0.6198    0.4946   -0.0019   -0.6198   -0.4946   -0.0019
      0         0    0.4946   -0.3972   -0.0024   -0.4946   -0.3972    0.0024
      0         0    0.0019    0.0024    0.0041    0.0019   -0.0024    0.0041
      0         0         0         0         0   -0.6198    0.4946   -0.0019
      0         0         0         0         0    0.4946   -0.3972   -0.0024
      0         0         0         0         0    0.0019    0.0024    0.0041
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
      0         0         0         0         0         0         0         0
-0.0003    0.0009         0         0         0         0         0         0
-0.0009    0.0018         0         0         0         0         0         0
 0.0000    0.0045   -0.4800         0         0         0         0         0
 1.2558         0         0   -0.0003    0.0009         0         0         0
      0    0.0259         0   -0.0009    0.0018         0         0         0
      0         0    2.1999    0.0000    0.0045   -0.4800         0         0
-0.0003   -0.0009    0.0000    1.2558         0         0   -0.0003    0.0009
 0.0009    0.0018    0.0045         0    0.0259         0   -0.0009    0.0018
      0         0   -0.4800         0         0    1.7199    0.0000    0.0045
```

```
         0         0         0   -0.0003   -0.0009    0.0000    1.2555   -0.0009
         0         0         0    0.0009    0.0018    0.0045   -0.0009    0.0223
Preprocesamiento completado
--- Paso 3: Procesamiento ---
=======================================
    RESULTADOS - NUDOS RÍGIDOS
=======================================

--- Desplazamientos nodales (d) ---
Formato: [dx, dy, θ] por nodo
         0         0         0
         0         0         0
   -0.0009   -0.0063   -0.0010
   -0.0008   -0.0111   -0.0006
    0.0000   -0.0130    0.0000
    0.0008   -0.0111    0.0006
    0.0009   -0.0063    0.0010
         0         0         0
         0         0         0
    0.0004    0.0005   -0.0003
    0.0014   -0.0029   -0.0008
    0.0007   -0.0089   -0.0007
    0.0002   -0.0127   -0.0003
   -0.0002   -0.0127    0.0003
   -0.0007   -0.0089    0.0007
   -0.0014   -0.0029    0.0008
   -0.0004    0.0005    0.0003
    0.0024   -0.0012   -0.0006
    0.0028   -0.0057   -0.0009
    0.0017   -0.0107   -0.0006
   -0.0000   -0.0126    0.0000
   -0.0017   -0.0107    0.0006
   -0.0028   -0.0057    0.0009
   -0.0024   -0.0012    0.0006

--- Tensiones en los elementos ---
   1.0e+07 *
         0
   -2.8864
    0.4369
    2.6039
    2.6039
    0.4369
   -2.8864
         0
    2.2881
    0.0158
   -3.7706
   -2.6467
    1.2321
    1.8716
   -1.3049
    1.0419
    1.2780
   -0.5792
    0.2053
    1.3411
    0.2053
   -0.5792
    1.2780
```

```
    1.0419
   -1.3049
    1.8716
    1.2321
   -2.6467
   -3.7706
    0.0158
    2.2881
    2.2967
    1.2266
   -2.7156
    1.0473
   -1.3268
    0.2050
   -0.5890
   -0.5890
    0.2050
   -1.3268
    1.0473
   -2.7156
    1.2266
    2.2967
    1.4317
   -3.5223
   -5.5039
   -5.5039
   -3.5223
    1.4317

Barra 48 tiene la máxima tensión: -55039350.3807 Pa
  (Valor absoluto: 55039350.3807 Pa)

--- Barras fallidas ---
✓ Ninguna barra falló.

--- Comprobación de equilibrio ---
Suma de fuerzas en X: 2.735760e-09 N
Suma de fuerzas en Y: -9.720679e-09 N
Suma de momentos:     2.683009e-11 N·m

--- Reacciones en los Apoyos ---
Nodo 1: Rx = -4.482e+05 N, Ry = -2.349e+05 N, M = -1.529e+03 N·m
Nodo 2: Rx = 9.824e+05 N, Ry = 1.235e+06 N, M = 1.145e+04 N·m
Nodo 8: Rx = -9.824e+05 N, Ry = 1.235e+06 N, M = -1.145e+04 N·m
Nodo 9: Rx = 4.482e+05 N, Ry = -2.349e+05 N, M = 1.529e+03 N·m
========================================
Procesamiento completado
--- Paso 4: Postprocesamiento ---

========================================
    RESUMEN POSTPROCESAMIENTO
========================================
Escala de deformación: ×500
Tensión mínima: -55.04 MPa
Tensión máxima: 26.04 MPa
Número de barras fallidas: 0
========================================
Postprocesamiento completado
--- Simulación completada correctamente ---
>>
```