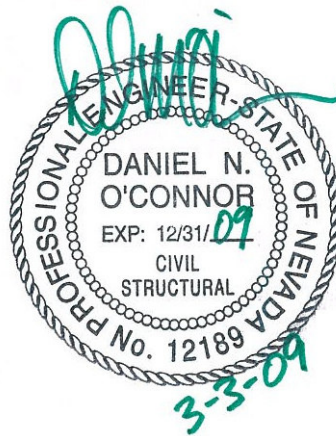
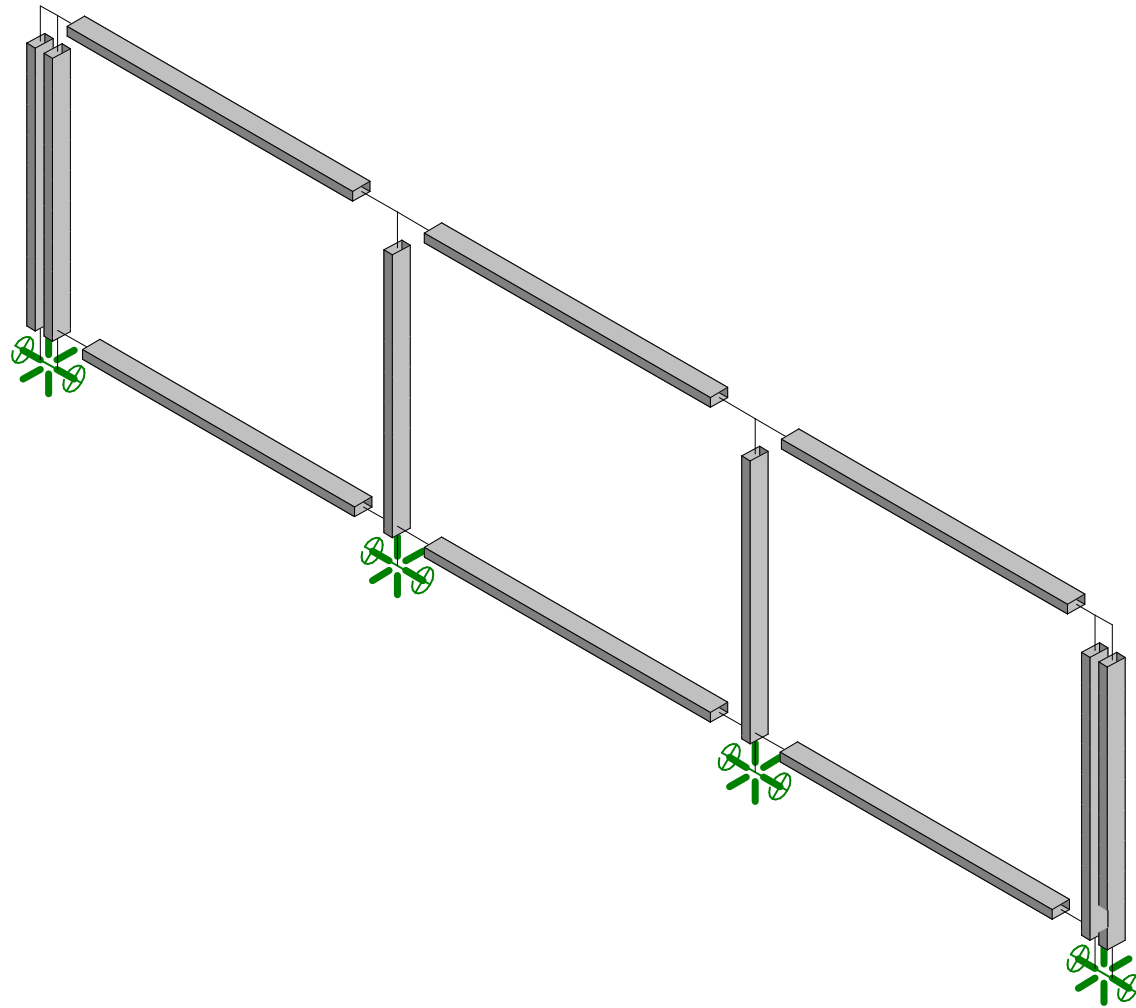
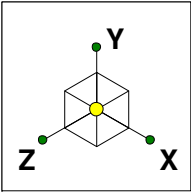


D1a—2" x 1" RECT. TUBE x 36-1/2" HIGH RAIL WITH BOTTOM RAIL

| | |
|---------------------|--|
| Building Code: | 2006 International Building Code 2007 California Building Code AISC Steel Construction Manual, 13th ed—ASD |
| Material: | Carbon Steel, A500, Grade B, Fy = 42 ksi Stainless Steel, A554, Grade MT-304 or MT-316, Fy = 30 ksi Stainless Steel, LDX 2101 (UNS S32101), Fy = 60 ksi (Anchor Post) |
| Height: | 36.5" |
| Anchor Post: | Carbon Steel: Double HSS 2x1x1/8 Tube Stainless Steel: Double 2"x1"x0.120" Tube (LDX 2101) |
| Intermediate Posts: | Carbon Steel: HSS 2x1x1/8 Tube Stainless Steel: 2"x1"x0.120" Tube |
| Top Rail: | Carbon Steel: HSS 2x1x1/8 Tube Stainless Steel: 2"x1"x0.120" Tube |
| Bottom Rail: | Carbon Steel: HSS 2x1x1/8 Tube Stainless Steel: 2"x1"x0.120" Tube |
| Number of Cables: | 9 |
| Cable Spacing: | 3.10" |
| Cable Prestress: | 400 lbs |



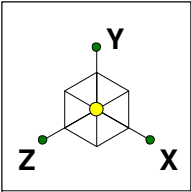
Disclaimer: Analysis and Structural Certification DOES NOT include base plates or anchorage to supporting structure. Where required by the Local Building Official, these shall be reviewed and designed by the project Structural Engineer of Record.



Ferrari Shields & Associates
o'c
08196

D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL

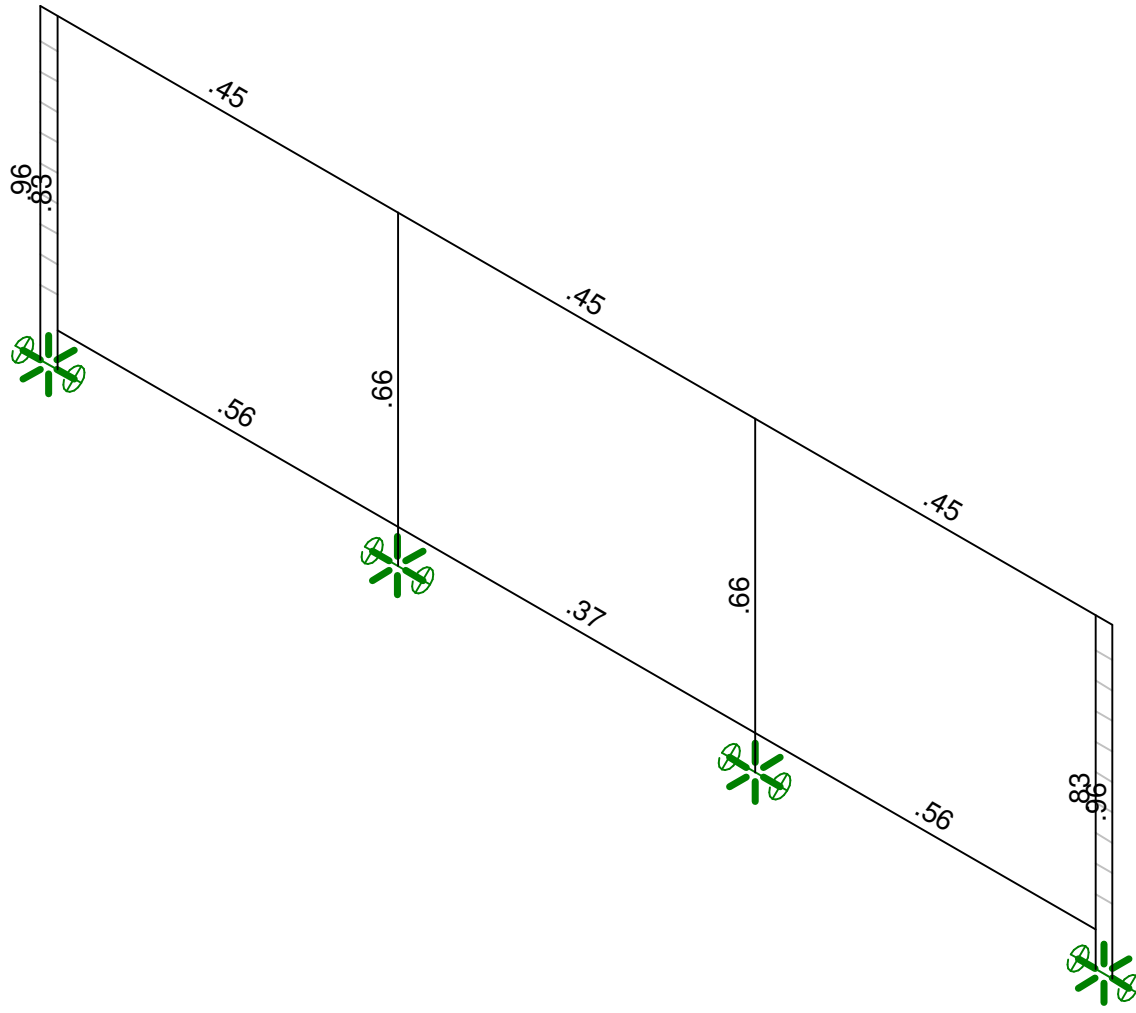
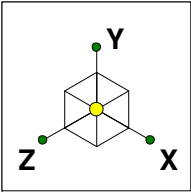
Oct 29, 2008 at 8:24 AM
D1a-2x1.R3D



Ferrari Shields & Associates
o'c
08196

D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL

Oct 29, 2008 at 8:23 AM
D1a-2x1.R3D

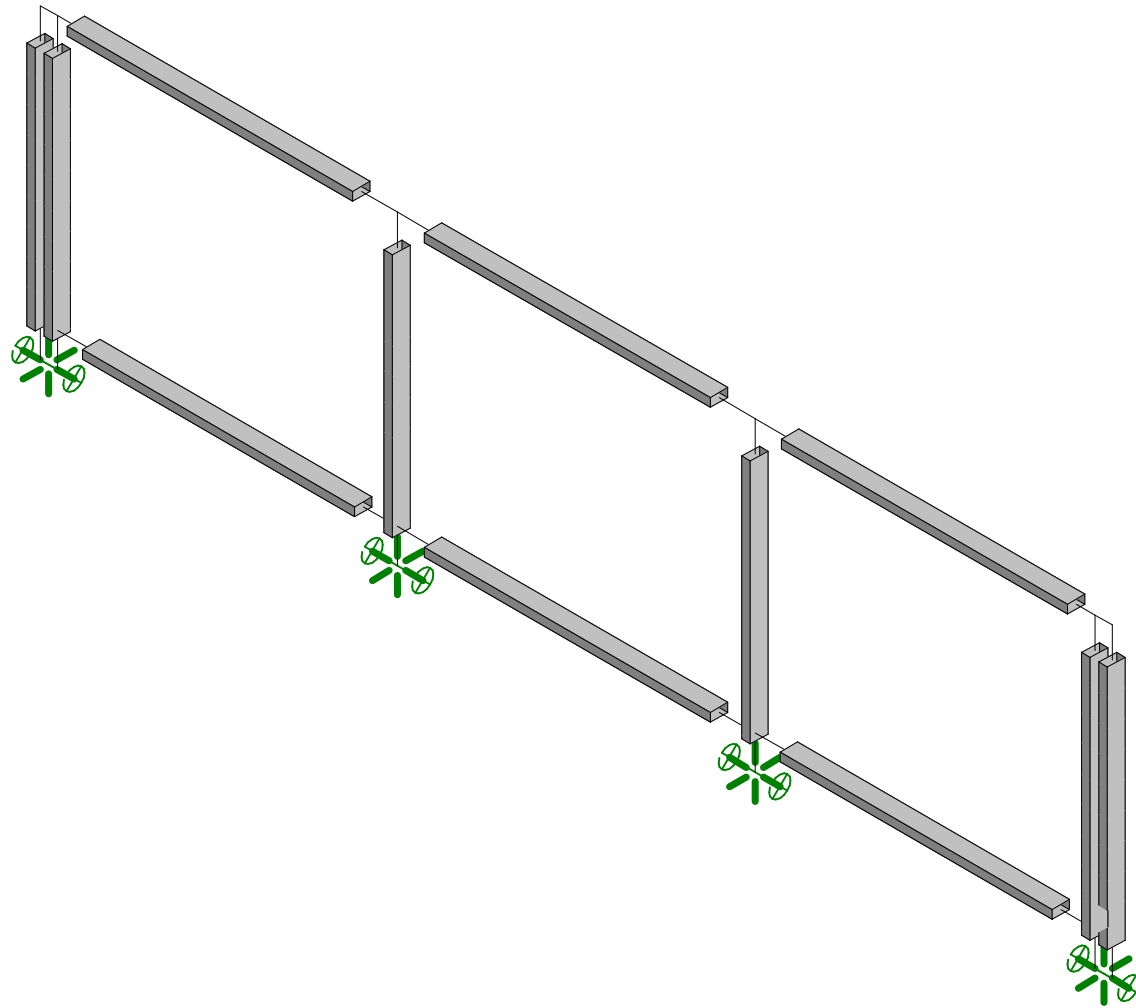
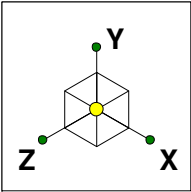


Member Code Checks Displayed
Solution: Envelope

| |
|------------------------------|
| Ferrari Shields & Associates |
| o'c |
| 08196 |

| |
|--|
| D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL |
|--|

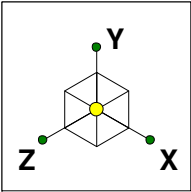
| |
|-------------------------|
| Oct 29, 2008 at 8:25 AM |
| D1a-2x1.R3D |



Ferrari Shields & Associates
o'c
08196

D1 (SS) - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL

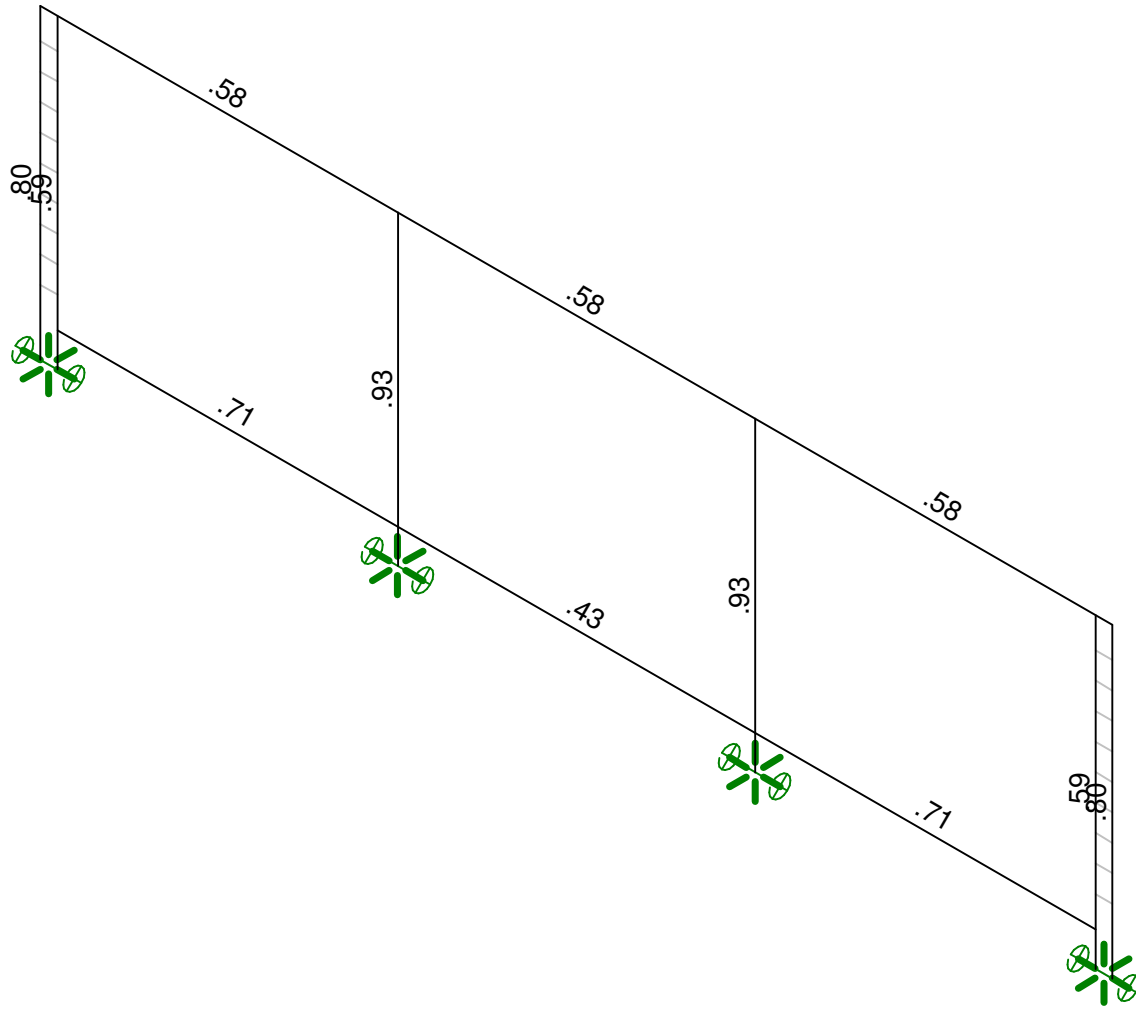
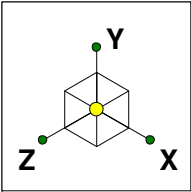
Dec 10, 2008 at 9:01 AM
D1a-2x1-ss.R3D



Ferrari Shields & Associates
o'c
08196

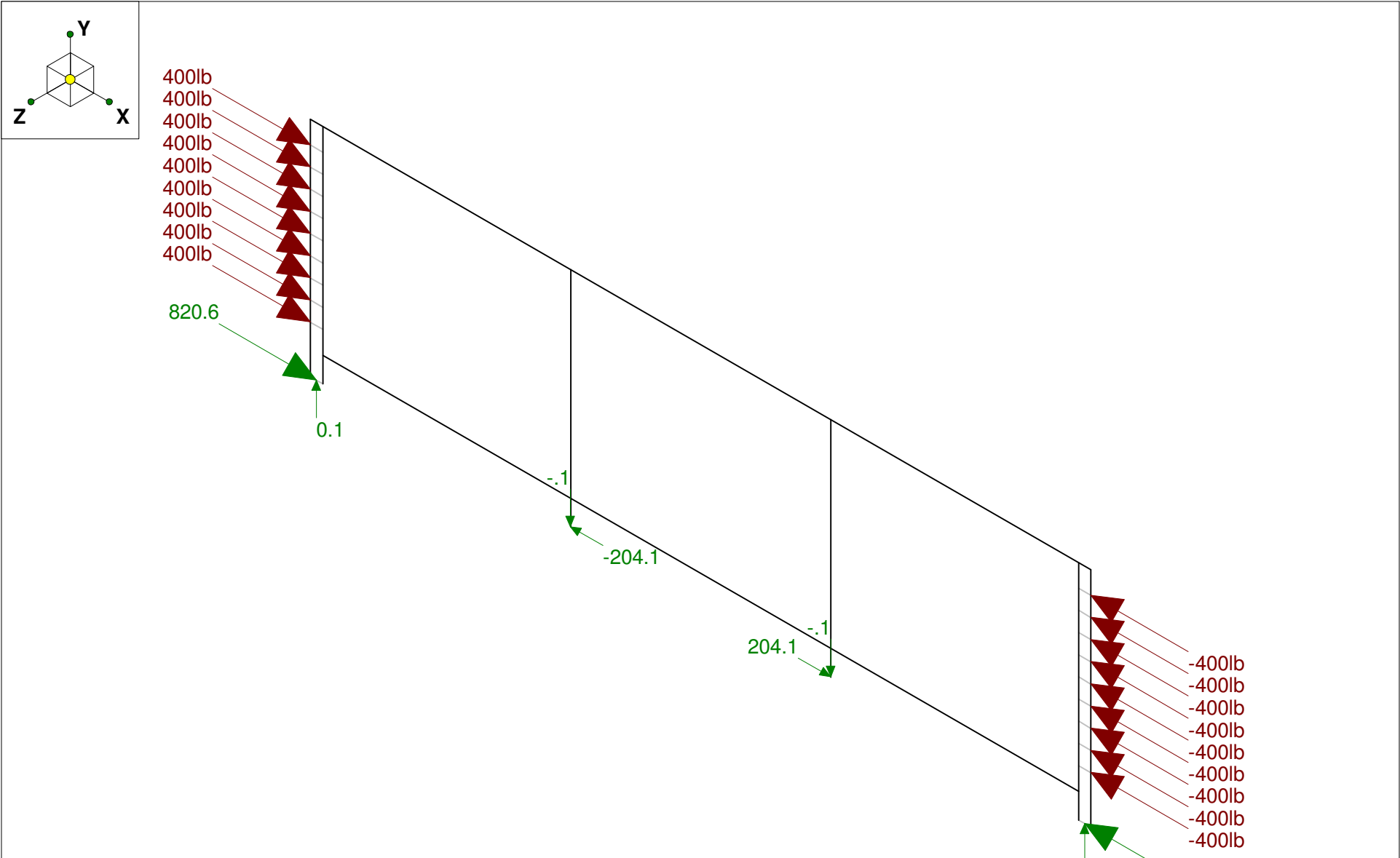
D1 (SS) - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL

Dec 10, 2008 at 9:00 AM
D1a-2x1-ss.R3D



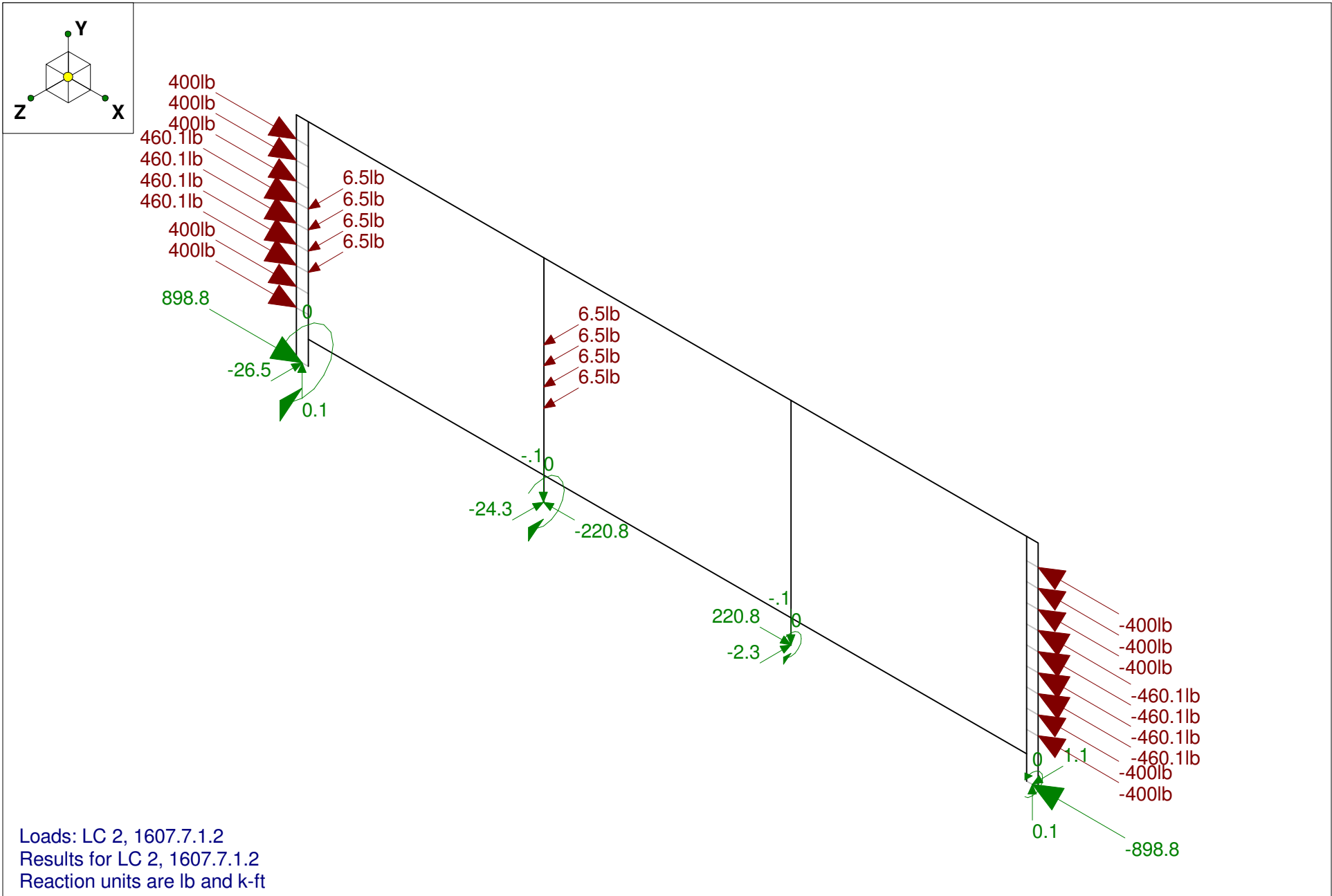
Member Code Checks Displayed
Solution: Envelope

| | | |
|------------------------------|--|-------------------------|
| Ferrari Shields & Associates | D1 (SS) - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL | |
| o'c | | Dec 10, 2008 at 9:01 AM |
| 08196 | | D1a-2x1-ss.R3D |



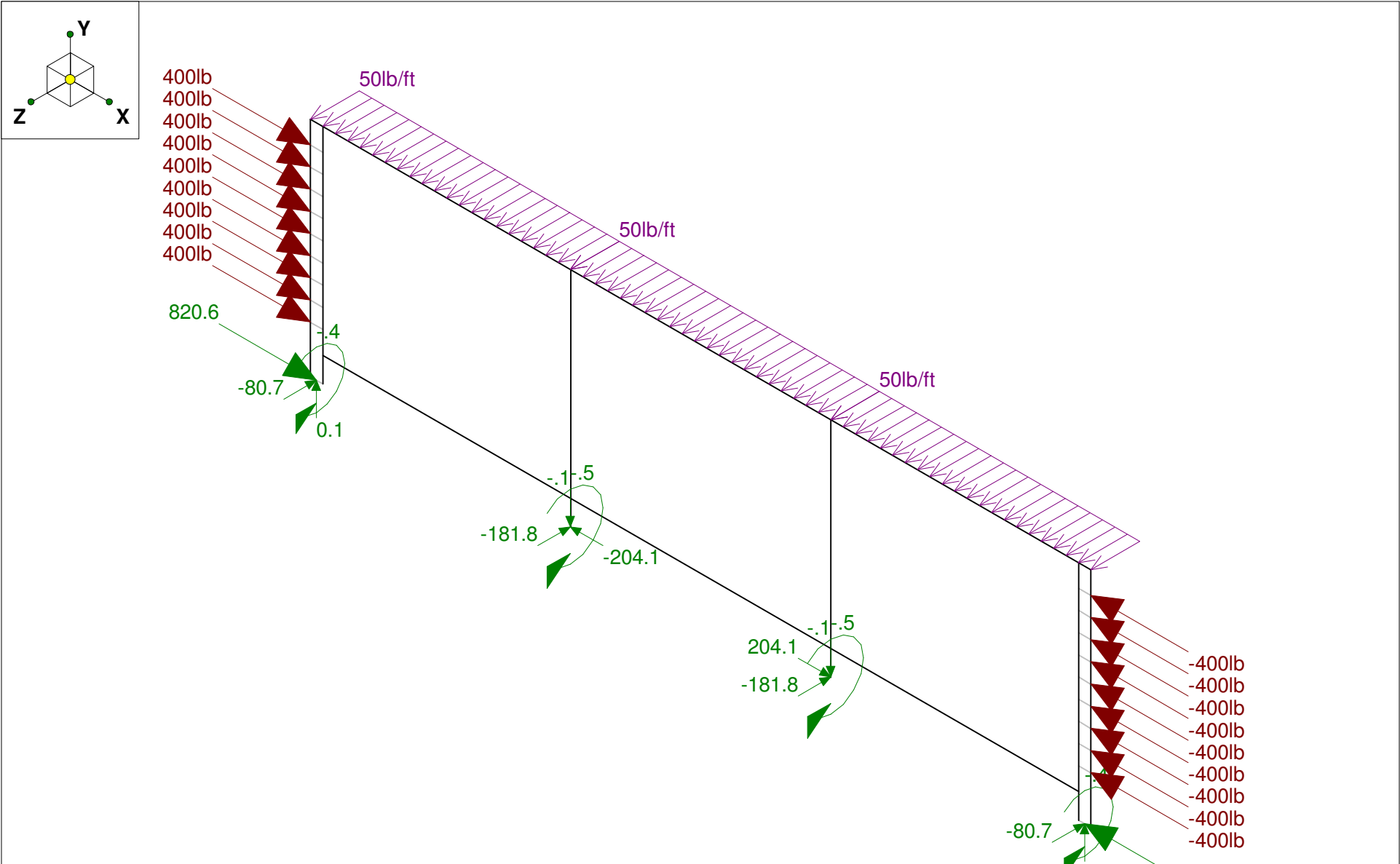
Loads: LC 1, Cable Prestress
 Results for LC 1, Cable Prestress
 Reaction units are lb and k-ft

| | | |
|------------------------------|--|-------------------------|
| Ferrari Shields & Associates | D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL | |
| o'c | | Oct 29, 2008 at 8:27 AM |
| 08196 | | D1a-2x1.R3D |



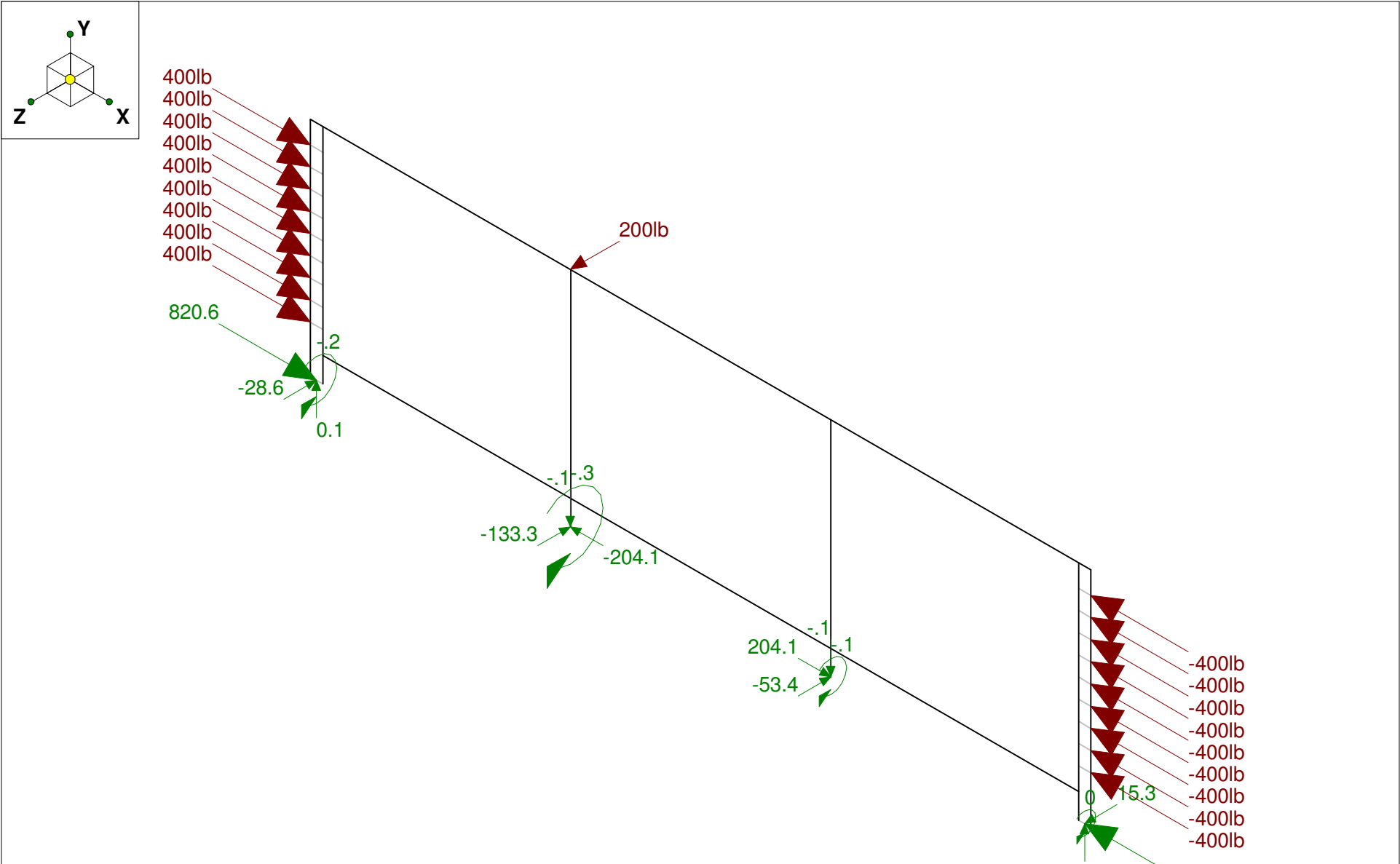
Loads: LC 2, 1607.7.1.2
 Results for LC 2, 1607.7.1.2
 Reaction units are lb and k-ft

| | | |
|------------------------------|--|-------------------------|
| Ferrari Shields & Associates | D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL | |
| o'c | | Oct 29, 2008 at 8:27 AM |
| 08196 | | D1a-2x1.R3D |



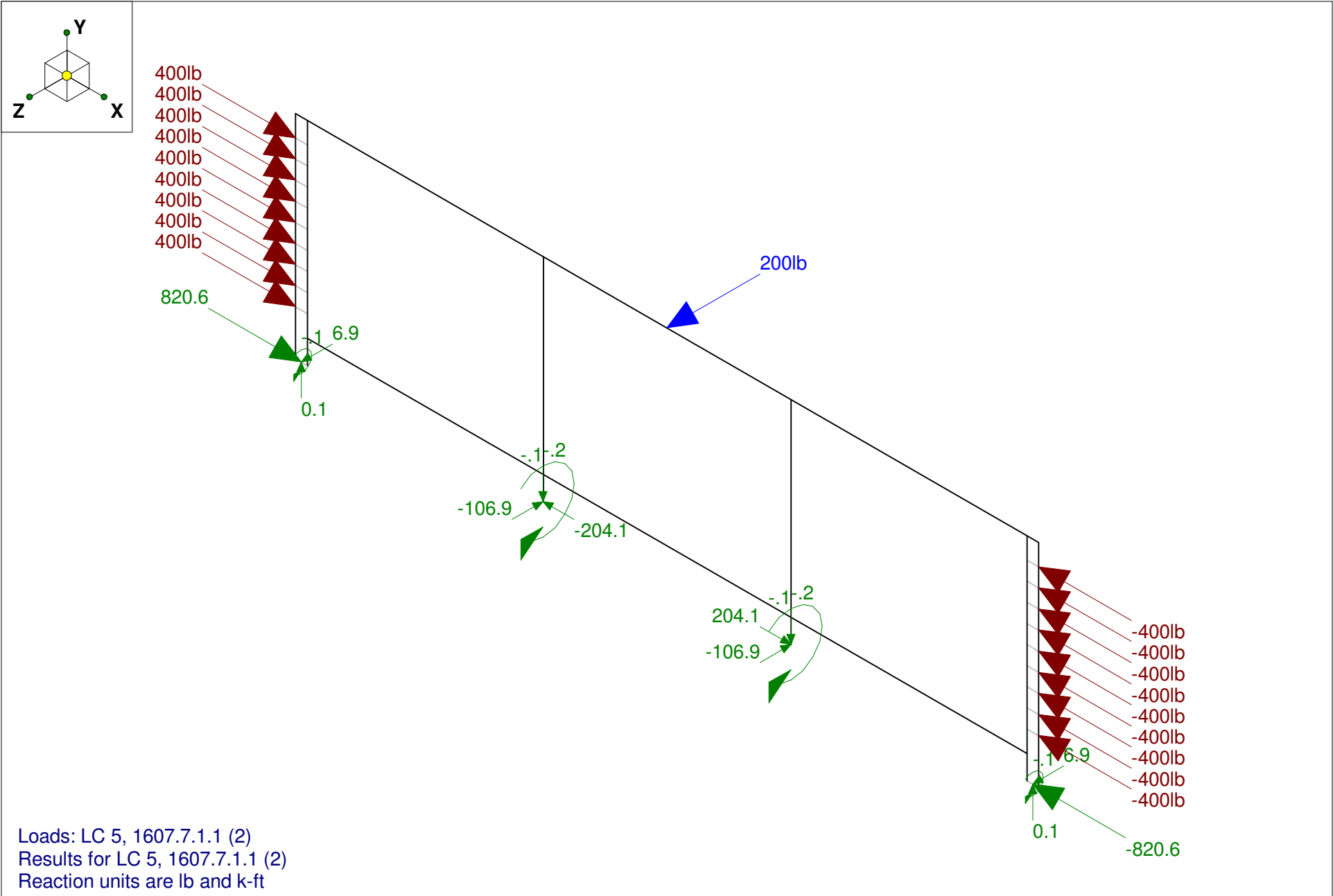
Loads: LC 3, 1607.7.1
 Results for LC 3, 1607.7.1
 Reaction units are lb and k-ft

| | | |
|------------------------------|--|-------------------------|
| Ferrari Shields & Associates | D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL | |
| o'c | | Oct 29, 2008 at 8:27 AM |
| 08196 | | D1a-2x1.R3D |



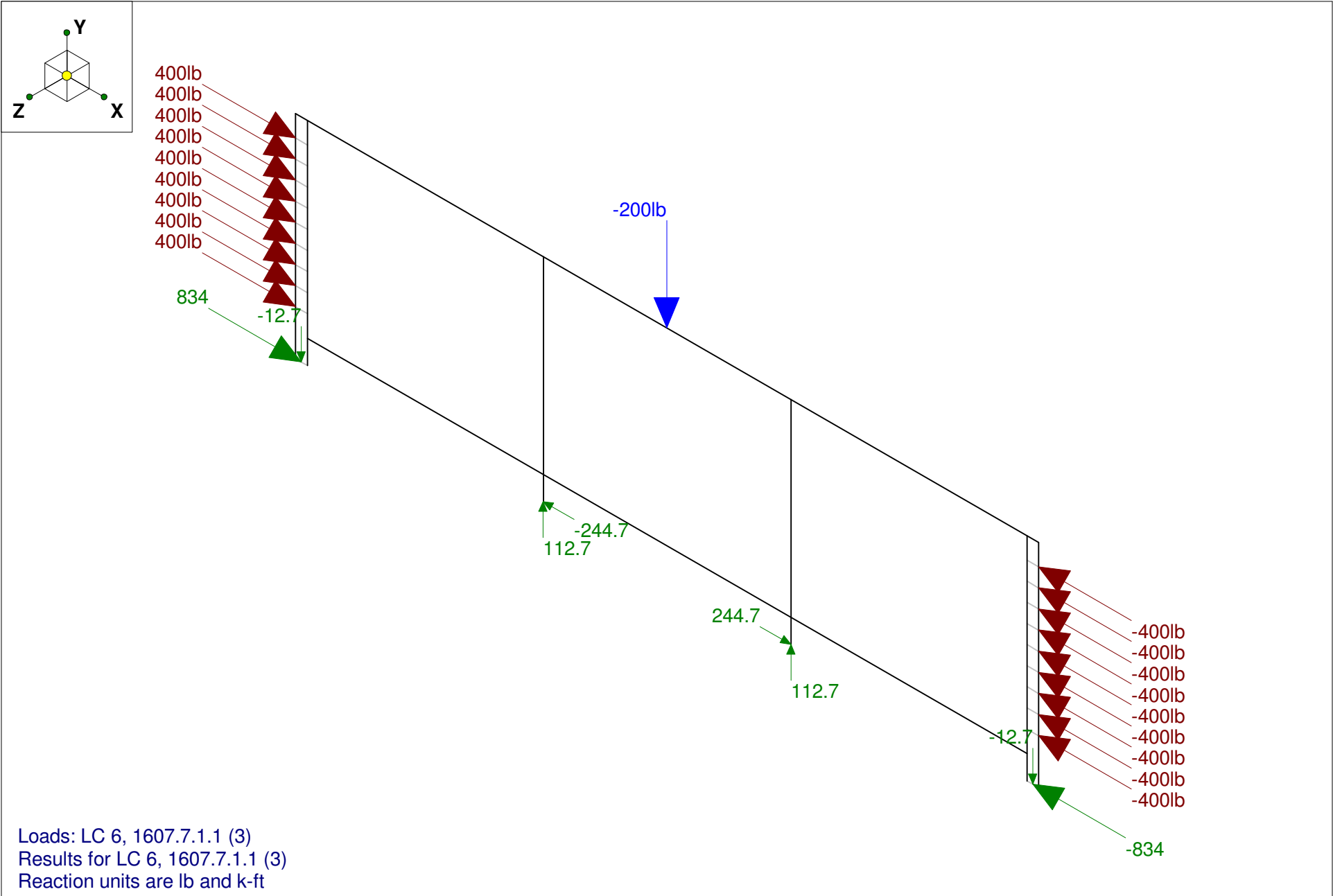
Loads: LC 4, 1607.7.1.1 (1)
 Results for LC 4, 1607.7.1.1 (1)
 Reaction units are lb and k-ft

| | | |
|------------------------------|--|-------------------------|
| Ferrari Shields & Associates | D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL | |
| o'c | | Oct 29, 2008 at 8:27 AM |
| 08196 | | D1a-2x1.R3D |



Loads: LC 5, 1607.7.1.1 (2)
 Results for LC 5, 1607.7.1.1 (2)
 Reaction units are lb and k-ft

| | | |
|------------------------------|--|-------------------------|
| Ferrari Shields & Associates | D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL | |
| o'c | | Oct 29, 2008 at 8:28 AM |
| 08196 | | D1a-2x1.R3D |



Loads: LC 6, 1607.7.1.1 (3)
 Results for LC 6, 1607.7.1.1 (3)
 Reaction units are lb and k-ft

| | | |
|------------------------------|--|-------------------------|
| Ferrari Shields & Associates | D1a - 2"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL | |
| o'c | | Oct 29, 2008 at 8:28 AM |
| 08196 | | D1a-2x1.R3D |

Global

| | |
|--|-------|
| Display Sections for Member Calcs | 5 |
| Max Internal Sections for Member Calcs | 97 |
| Include Shear Deformation | Yes |
| Include Warping | Yes |
| Area Load Mesh (in^2) | 144 |
| Merge Tolerance (in) | .12 |
| P-Delta Analysis Tolerance | 0.50% |
| Vertical Axis | Y |

| | |
|------------------------|-----------------|
| Hot Rolled Steel Code | AISC : ASD 13th |
| Cold Formed Steel Code | AISI 99: ASD |
| Wood Code | NDS 91/97: ASD |
| Wood Temperature | < 100F |
| Concrete Code | ACI 2005 |

| | |
|-------------------------------|------------------|
| Number of Shear Regions | 4 |
| Region Spacing Increment (in) | 4 |
| Biaxial Column Method | PCA Load Contour |
| Parame Beta Factor (PCA) | .65 |
| Concrete Stress Block | Rectangular |
| Use Cracked Sections | Yes |
| Bad Framing Warnings | No |
| Unused Force Warnings | Yes |

Hot Rolled Steel Properties

| | Label | E [ksi] | G [ksi] | Nu | Therm (1E5 F) | Density[k/ft^3] | Yield[ksi] |
|---|----------|---------|---------|----|---------------|-----------------|------------|
| 1 | A500Gr42 | 29000 | 11154 | .3 | .65 | .49 | 42 |
| 2 | SS316 | 28000 | 11154 | .3 | .65 | .49 | 30 |

Hot Rolled Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design Rules | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|-------|----------|--------|-------------|----------|--------------|---------|-----------|-----------|---------|
| 1 | RAIL | HSS2X1X2 | Beam | Tube | A500Gr42 | Typical | .609 | .092 | .28 | .238 |
| 2 | POST | HSS2X1X2 | Column | Tube | A500Gr42 | Typical | .609 | .092 | .28 | .238 |

General Material Properties

| | Label | E [ksi] | G [ksi] | Nu | Therm (1E5 F) | Density[k/ft^3] |
|---|-----------|---------|---------|----|---------------|-----------------|
| 1 | GEN_RIGID | 1e+6 | | .3 | .65 | 0 |

General Section Sets

| | Label | Shape | Type | Material | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|-------|-------|------|-----------|---------|-----------|-----------|---------|
| 1 | LINK | | Beam | GEN_RIGID | .25 | .005 | .005 | .01 |

Basic Load Cases

| | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distributed | Area (Mem... | Surface (Pl... |
|---|-----------------|----------|-----------|-----------|-----------|-------|-------|-------------|--------------|----------------|
| 1 | Cable Prestress | None | | | | 18 | | | | |
| 2 | 1607.7.1.2 | None | | | | 16 | | | | |

Basic Load Cases (Continued)

| | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distributed | Area (Mem... | Surface (Pl... |
|---|-----------------|----------|-----------|-----------|-----------|-------|-------|-------------|--------------|----------------|
| 3 | 1607.7.1 | None | | | | | | 3 | | |
| 4 | 1607.7.1.1 (1) | None | | | | 1 | | | | |
| 5 | 1607.7.1.1 (2) | None | | | | | 1 | | | |
| 6 | 1607.7.1.1 (3) | None | | | | | 1 | | | |

Load Combinations

| | Description | Solve | PDelta | SR... | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor |
|---|-----------------|-------|--------|-------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1 | Cable Prestress | Yes | C | | 1 | 1 | | | | | | | |
| 2 | 1607.7.1.2 | Yes | C | | 1 | 1 | 2 | 1 | | | | | |
| 3 | 1607.7.1 | Yes | C | | 1 | 1 | 3 | 1 | | | | | |
| 4 | 1607.7.1.1 (1) | Yes | C | | 1 | 1 | 4 | 1 | | | | | |
| 5 | 1607.7.1.1 (2) | Yes | C | | 1 | 1 | 5 | 1 | | | | | |
| 6 | 1607.7.1.1 (3) | Yes | C | | 1 | 1 | 6 | 1 | | | | | |

Member Primary Data

| | Label | I Joint | J Joint | K Joint | Rotate(deg) | Section/Shape | Type | Design List | Material | Design Rules |
|----|-------|---------|---------|---------|-------------|---------------|--------|-------------|-----------|--------------|
| 1 | M1 | N1 | N2 | | 90 | POST | Column | Tube | A500Gr42 | Typical |
| 2 | M2 | N3 | N4 | | 90 | POST | Column | Tube | A500Gr42 | Typical |
| 3 | M3 | N2 | N4 | | 90 | RAIL | Beam | Tube | A500Gr42 | Typical |
| 4 | M4 | N4 | N8 | | 90 | RAIL | Beam | Tube | A500Gr42 | Typical |
| 5 | M5 | N5 | N6 | | 90 | POST | Column | Tube | A500Gr42 | Typical |
| 6 | M6 | N7 | N8 | | 90 | POST | Column | Tube | A500Gr42 | Typical |
| 7 | M7 | N8 | N6 | | 90 | RAIL | Beam | Tube | A500Gr42 | Typical |
| 8 | M8 | N29 | N30 | | 90 | POST | Column | Tube | A500Gr42 | Typical |
| 9 | M9 | N41 | N42 | | 90 | POST | Column | Tube | A500Gr42 | Typical |
| 10 | M10 | N1 | N53 | | | LINK | Beam | None | GEN_RIGID | Default |
| 11 | M11 | N41 | N54 | | | LINK | Beam | None | GEN_RIGID | Default |
| 12 | M12 | N53 | N29 | | | LINK | Beam | None | GEN_RIGID | Default |
| 13 | M13 | N54 | N5 | | | LINK | Beam | None | GEN_RIGID | Default |
| 14 | M15 | N11 | N32 | | | LINK | Beam | None | GEN_RIGID | Default |
| 15 | M16 | N13 | N33 | | | LINK | Beam | None | GEN_RIGID | Default |
| 16 | M17 | N15 | N34 | | | LINK | Beam | None | GEN_RIGID | Default |
| 17 | M18 | N17 | N35 | | | LINK | Beam | None | GEN_RIGID | Default |
| 18 | M19 | N19 | N36 | | | LINK | Beam | None | GEN_RIGID | Default |
| 19 | M20 | N21 | N37 | | | LINK | Beam | None | GEN_RIGID | Default |
| 20 | M21 | N23 | N38 | | | LINK | Beam | None | GEN_RIGID | Default |
| 21 | M22 | N25 | N39 | | | LINK | Beam | None | GEN_RIGID | Default |
| 22 | M23 | N27 | N40 | | | LINK | Beam | None | GEN_RIGID | Default |
| 23 | M25 | N44 | N12 | | | LINK | Beam | None | GEN_RIGID | Default |
| 24 | M26 | N45 | N14 | | | LINK | Beam | None | GEN_RIGID | Default |
| 25 | M27 | N46 | N16 | | | LINK | Beam | None | GEN_RIGID | Default |
| 26 | M28 | N47 | N18 | | | LINK | Beam | None | GEN_RIGID | Default |
| 27 | M29 | N48 | N20 | | | LINK | Beam | None | GEN_RIGID | Default |
| 28 | M30 | N49 | N22 | | | LINK | Beam | None | GEN_RIGID | Default |
| 29 | M31 | N50 | N24 | | | LINK | Beam | None | GEN_RIGID | Default |
| 30 | M32 | N51 | N26 | | | LINK | Beam | None | GEN_RIGID | Default |
| 31 | M33 | N52 | N28 | | | LINK | Beam | None | GEN_RIGID | Default |
| 32 | M34 | N31 | N59 | | 90 | RAIL | Beam | Tube | A500Gr42 | Typical |
| 33 | M35 | N59 | N60 | | 90 | RAIL | Beam | Tube | A500Gr42 | Typical |
| 34 | M36 | N60 | N43 | | 90 | RAIL | Beam | Tube | A500Gr42 | Typical |

Envelope Joint Reactions

| | Joint | | X [lb] | lc | Y [lb] | lc | Z [lb] | lc | MX [k-ft] | lc | MY [k-ft] | lc | MZ [k-ft] | lc |
|----|---------|-----|----------|----|---------|----|----------|----|-----------|----|-----------|----|-----------|----|
| 1 | N3 | max | -204.139 | 1 | 112.681 | 6 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 2 | | min | -244.707 | 6 | -.092 | 4 | -181.794 | 3 | -.461 | 3 | 0 | 1 | 0 | 1 |
| 3 | N7 | max | 244.661 | 6 | 112.689 | 6 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 4 | | min | 204.139 | 1 | -.092 | 4 | -181.794 | 3 | -.461 | 3 | 0 | 1 | 0 | 1 |
| 5 | N53 | max | 898.834 | 2 | .092 | 4 | 6.862 | 5 | 0 | 1 | 0 | 1 | 0 | 1 |
| 6 | | min | 820.625 | 1 | -12.683 | 6 | -80.706 | 3 | -.402 | 3 | 0 | 1 | 0 | 1 |
| 7 | N54 | max | -820.625 | 1 | .092 | 4 | 15.314 | 4 | .001 | 2 | 0 | 1 | 0 | 1 |
| 8 | | min | -898.834 | 2 | -12.687 | 6 | -80.706 | 3 | -.402 | 3 | 0 | 1 | 0 | 1 |
| 9 | Totals: | max | 0 | 2 | 200 | 6 | 0 | 1 | | | | | | |
| 10 | | min | 0 | 6 | 0 | 1 | -525 | 3 | | | | | | |

Envelope Member Section Forces

| | Member | Sec | | Axial[lb] | lc | y Shear[lb] | lc | z Shear[lb] | lc | Torque[k-ft] | lc | y-y Moment[...] | lc | z-z Moment[...] | lc |
|----|--------|-----|-----|-----------|----|-------------|----|-------------|----|--------------|----|-----------------|----|-----------------|----|
| 1 | M1 | 1 | max | -458.334 | 1 | 6.873 | 5 | -142.029 | 6 | .011 | 3 | .051 | 2 | 0 | 1 |
| 2 | | | min | -513.515 | 2 | -31.897 | 3 | -149.038 | 2 | 0 | 1 | .048 | 6 | -.194 | 3 |
| 3 | | 2 | max | 2193.245 | 2 | 50.222 | 5 | -862.556 | 1 | .016 | 3 | -.01 | 6 | 0 | 1 |
| 4 | | | min | 2038.998 | 6 | -12.373 | 2 | -943.012 | 2 | 0 | 1 | -.01 | 2 | -.161 | 3 |
| 5 | | 3 | max | 6174.889 | 2 | 42.128 | 5 | -151.181 | 1 | .017 | 3 | -.085 | 1 | 0 | 1 |
| 6 | | | min | 5625.979 | 1 | -9.872 | 2 | -162.228 | 2 | 0 | 2 | -.094 | 2 | -.113 | 3 |
| 7 | | 4 | max | 4704.203 | 2 | 41.172 | 5 | 515.751 | 2 | .017 | 3 | -.102 | 1 | 0 | 1 |
| 8 | | | min | 4391.428 | 1 | -4.491 | 2 | 460.719 | 6 | 0 | 2 | -.11 | 2 | -.055 | 3 |
| 9 | | 5 | max | 692.348 | 6 | 25.175 | 5 | 821.022 | 2 | .018 | 3 | .087 | 2 | 0 | 2 |
| 10 | | | min | 646.459 | 4 | -1.797 | 2 | 777.093 | 4 | 0 | 2 | .081 | 6 | -.018 | 3 |
| 11 | M2 | 1 | max | 112.681 | 6 | 0 | 1 | -204.139 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 12 | | | min | -.092 | 4 | -181.794 | 3 | -244.839 | 6 | 0 | 1 | 0 | 1 | -.461 | 3 |
| 13 | | 2 | max | 74.504 | 6 | 0 | 1 | 38.449 | 6 | .019 | 5 | -.011 | 1 | 0 | 1 |
| 14 | | | min | -42.396 | 2 | -161.815 | 3 | 17.071 | 1 | 0 | 2 | -.02 | 6 | -.337 | 3 |
| 15 | | 3 | max | 74.504 | 6 | 0 | 1 | 38.479 | 6 | .019 | 5 | .009 | 6 | 0 | 1 |
| 16 | | | min | -42.396 | 2 | -161.815 | 3 | 17.071 | 1 | 0 | 2 | .001 | 1 | -.216 | 3 |
| 17 | | 4 | max | 74.504 | 6 | 2.265 | 2 | 38.3 | 6 | .019 | 5 | .038 | 6 | .002 | 2 |
| 18 | | | min | -42.396 | 2 | -161.815 | 3 | 17.071 | 1 | 0 | 2 | .014 | 1 | -.095 | 3 |
| 19 | | 5 | max | 74.504 | 6 | 2.265 | 2 | 38.3 | 6 | .019 | 5 | .067 | 6 | .038 | 4 |
| 20 | | | min | -42.396 | 2 | -161.815 | 3 | 17.071 | 1 | 0 | 2 | .027 | 1 | 0 | 1 |
| 21 | M3 | 1 | max | 814.81 | 2 | 23.307 | 5 | -641.147 | 4 | 0 | 2 | .087 | 2 | 0 | 2 |
| 22 | | | min | 771.598 | 4 | -1.266 | 2 | -686.931 | 6 | -.018 | 3 | .081 | 6 | -.018 | 3 |
| 23 | | 2 | max | 1802.585 | 2 | 0 | 1 | -25.803 | 6 | 0 | 2 | .074 | 2 | .018 | 3 |
| 24 | | | min | 1696.407 | 6 | -65.107 | 3 | -42.73 | 2 | -.027 | 3 | .064 | 6 | -.02 | 5 |
| 25 | | 3 | max | 1802.585 | 2 | 0 | 1 | -25.803 | 6 | 0 | 2 | .041 | 6 | .056 | 3 |
| 26 | | | min | 1696.407 | 6 | -50.959 | 4 | -42.73 | 2 | -.027 | 3 | .034 | 1 | -.006 | 5 |
| 27 | | 4 | max | 1802.585 | 2 | 22.393 | 3 | -25.803 | 6 | 0 | 2 | .019 | 6 | .09 | 4 |
| 28 | | | min | 1696.407 | 6 | -50.959 | 4 | -42.73 | 2 | -.027 | 3 | -.001 | 2 | 0 | 1 |
| 29 | | 5 | max | 1802.585 | 2 | 66.143 | 3 | -25.803 | 6 | 0 | 2 | -.004 | 6 | .134 | 4 |
| 30 | | | min | 1696.407 | 6 | -50.959 | 4 | -42.73 | 2 | -.027 | 3 | -.039 | 2 | 0 | 1 |
| 31 | M4 | 1 | max | 1821.048 | 2 | 48.363 | 4 | 0 | 1 | .017 | 4 | .063 | 6 | .132 | 4 |
| 32 | | | min | 1720.539 | 4 | -100 | 5 | -99.993 | 6 | 0 | 1 | -.009 | 2 | 0 | 1 |
| 33 | | 2 | max | 1821.048 | 2 | 48.363 | 4 | 0 | 1 | .017 | 4 | -.009 | 1 | .092 | 5 |
| 34 | | | min | 1720.539 | 4 | -100 | 5 | -99.993 | 6 | 0 | 1 | -.025 | 6 | 0 | 1 |
| 35 | | 3 | max | 1821.048 | 2 | 100 | 5 | 100.007 | 6 | .017 | 4 | -.009 | 1 | .179 | 5 |
| 36 | | | min | 1720.539 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.112 | 6 | 0 | 1 |
| 37 | | 4 | max | 1821.048 | 2 | 100 | 5 | 100.007 | 6 | .017 | 4 | -.009 | 1 | .092 | 5 |

Envelope Member Section Forces (Continued)

| Member | Sec | | Axial[lb] | lc | y Shear[lb] | lc | z Shear[lb] | lc | Torque[k-ft] | lc | y-y Moment[...] | lc | z-z Moment[...] | lc | |
|--------|-----|-----|-----------|-----------|-------------|--------|-------------|----------|--------------|------|-----------------|-------|-----------------|------|---|
| 38 | | min | 1720.539 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.025 | 6 | -.001 | 2 | |
| 39 | 5 | max | 1821.048 | 2 | 100 | 5 | 100.007 | 6 | .017 | 4 | .063 | 6 | .004 | 5 | |
| 40 | | min | 1720.539 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.009 | 2 | -.038 | 4 | |
| 41 | M5 | 1 | max | -458.334 | 1 | 9.09 | 4 | 149.038 | 2 | 0 | 1 | -.048 | 6 | 0 | 2 |
| 42 | | min | -513.515 | 2 | -31.897 | 3 | 142.031 | 6 | -.011 | 3 | -.051 | 2 | -.194 | 3 | |
| 43 | | 2 | max | 2193.245 | 2 | 50.222 | 5 | 943.012 | 2 | 0 | 1 | .01 | 2 | 0 | 2 |
| 44 | | min | 2039.01 | 6 | 0 | 1 | 862.556 | 1 | -.016 | 3 | .01 | 6 | -.161 | 3 | |
| 45 | | 3 | max | 6174.889 | 2 | 42.128 | 5 | 162.228 | 2 | 0 | 1 | .094 | 2 | 0 | 2 |
| 46 | | min | 5625.979 | 1 | -2.982 | 3 | 151.181 | 1 | -.017 | 3 | .085 | 1 | -.113 | 3 | |
| 47 | | 4 | max | 4704.203 | 2 | 41.172 | 5 | -460.72 | 6 | 0 | 1 | .11 | 2 | 0 | 1 |
| 48 | | min | 4391.428 | 1 | -3.114 | 3 | -515.751 | 2 | -.017 | 3 | .102 | 1 | -.055 | 3 | |
| 49 | | 5 | max | 692.345 | 6 | 25.175 | 5 | -777.093 | 4 | 0 | 1 | -.081 | 6 | 0 | 1 |
| 50 | | min | 646.459 | 4 | 0 | 1 | -821.022 | 2 | -.018 | 3 | -.087 | 2 | -.018 | 3 | |
| 51 | M6 | 1 | max | 112.689 | 6 | 0 | 1 | 244.793 | 6 | 0 | 1 | 0 | 1 | 0 | 1 |
| 52 | | min | -.092 | 4 | -181.794 | 3 | 204.139 | 1 | 0 | 1 | 0 | 1 | -.461 | 3 | |
| 53 | | 2 | max | 74.513 | 6 | 0 | 1 | -17.071 | 1 | 0 | 1 | .02 | 6 | 0 | 1 |
| 54 | | min | -42.396 | 2 | -161.815 | 3 | -38.393 | 6 | -.019 | 5 | .011 | 1 | -.337 | 3 | |
| 55 | | 3 | max | 74.513 | 6 | 0 | 1 | -17.071 | 1 | 0 | 1 | -.001 | 1 | 0 | 1 |
| 56 | | min | -42.396 | 2 | -161.815 | 3 | -38.393 | 6 | -.019 | 5 | -.009 | 6 | -.216 | 3 | |
| 57 | | 4 | max | 74.513 | 6 | 0 | 1 | -17.071 | 1 | 0 | 1 | -.014 | 1 | 0 | 1 |
| 58 | | min | -42.396 | 2 | -161.815 | 3 | -38.393 | 6 | -.019 | 5 | -.038 | 6 | -.095 | 3 | |
| 59 | | 5 | max | 74.513 | 6 | 0 | 1 | -17.071 | 1 | 0 | 1 | -.027 | 1 | .027 | 3 |
| 60 | | min | -42.396 | 2 | -161.815 | 3 | -38.393 | 6 | -.019 | 5 | -.067 | 6 | 0 | 2 | |
| 61 | M7 | 1 | max | 1802.585 | 2 | 16.589 | 5 | 42.73 | 2 | .027 | 3 | -.004 | 6 | .023 | 5 |
| 62 | | min | 1696.41 | 6 | -66.143 | 3 | 25.808 | 6 | 0 | 1 | -.039 | 2 | -.019 | 4 | |
| 63 | | 2 | max | 1802.585 | 2 | 16.589 | 5 | 42.73 | 2 | .027 | 3 | .019 | 6 | .055 | 3 |
| 64 | | min | 1696.41 | 6 | -22.393 | 3 | 25.808 | 6 | 0 | 1 | -.001 | 2 | -.02 | 4 | |
| 65 | | 3 | max | 1802.585 | 2 | 21.357 | 3 | 42.73 | 2 | .027 | 3 | .041 | 6 | .056 | 3 |
| 66 | | min | 1696.41 | 6 | -.328 | 2 | 25.808 | 6 | 0 | 1 | .034 | 1 | -.02 | 4 | |
| 67 | | 4 | max | 1802.585 | 2 | 65.107 | 3 | 42.73 | 2 | .027 | 3 | .074 | 2 | .018 | 3 |
| 68 | | min | 1696.41 | 6 | -.328 | 2 | 25.808 | 6 | 0 | 1 | .064 | 6 | -.02 | 5 | |
| 69 | | 5 | max | 814.81 | 2 | 0 | 1 | 686.929 | 6 | .018 | 3 | .087 | 2 | 0 | 1 |
| 70 | | min | 771.598 | 4 | -23.307 | 5 | 641.147 | 4 | 0 | 1 | .081 | 6 | -.018 | 3 | |
| 71 | M8 | 1 | max | 513.586 | 2 | 0 | 1 | 1045.845 | 2 | 0 | 1 | -.125 | 1 | 0 | 1 |
| 72 | | min | 458.426 | 1 | -49.731 | 3 | 962.219 | 1 | -.013 | 3 | -.137 | 2 | -.208 | 3 | |
| 73 | | 2 | max | -2008.366 | 1 | 0 | 1 | -647.186 | 1 | .02 | 3 | -.04 | 1 | 0 | 1 |
| 74 | | min | -2150.849 | 2 | -136.615 | 3 | -710.225 | 2 | 0 | 1 | -.042 | 2 | -.167 | 3 | |
| 75 | | 3 | max | -5586.709 | 1 | 0 | 1 | -151.178 | 1 | .017 | 3 | -.085 | 1 | 0 | 1 |
| 76 | | min | -6132.492 | 2 | -142.237 | 3 | -162.224 | 2 | 0 | 2 | -.094 | 2 | -.118 | 3 | |
| 77 | | 4 | max | -4352.158 | 1 | .055 | 2 | 515.765 | 2 | .017 | 3 | -.102 | 1 | 0 | 1 |
| 78 | | min | -4661.806 | 2 | -140.441 | 3 | 460.724 | 6 | 0 | 2 | -.11 | 2 | -.065 | 3 | |
| 79 | | 5 | max | -607.189 | 4 | .503 | 2 | 987.775 | 2 | .021 | 3 | .129 | 2 | 0 | 2 |
| 80 | | min | -666.858 | 6 | -107.89 | 3 | 918.643 | 6 | 0 | 2 | .115 | 6 | -.012 | 5 | |
| 81 | M9 | 1 | max | 513.586 | 2 | 6.201 | 4 | -962.219 | 1 | .013 | 3 | .137 | 2 | 0 | 2 |
| 82 | | min | 458.426 | 1 | -49.731 | 3 | -1045.845 | 2 | 0 | 1 | .125 | 1 | -.208 | 3 | |
| 83 | | 2 | max | -2008.366 | 1 | 0 | 1 | 710.225 | 2 | 0 | 1 | .042 | 2 | 0 | 2 |
| 84 | | min | -2150.849 | 2 | -136.615 | 3 | 647.186 | 1 | -.02 | 3 | .04 | 1 | -.167 | 3 | |
| 85 | | 3 | max | -5586.709 | 1 | 0 | 1 | 162.224 | 2 | 0 | 1 | .094 | 2 | 0 | 1 |
| 86 | | min | -6132.492 | 2 | -142.237 | 3 | 151.178 | 1 | -.017 | 3 | .085 | 1 | -.118 | 3 | |
| 87 | | 4 | max | -4352.158 | 1 | 0 | 1 | -460.725 | 6 | 0 | 1 | .11 | 2 | 0 | 1 |
| 88 | | min | -4661.806 | 2 | -140.441 | 3 | -515.765 | 2 | -.017 | 3 | .102 | 1 | -.065 | 3 | |
| 89 | | 5 | max | -607.189 | 4 | 0 | 1 | -918.645 | 6 | 0 | 1 | -.115 | 6 | 0 | 1 |
| 90 | | min | -666.852 | 6 | -107.89 | 3 | -987.775 | 2 | -.021 | 3 | -.129 | 2 | -.012 | 5 | |

Envelope Member Section Forces (Continued)

| | Member | Sec | | Axial[lb] | lc | y Shear[lb] | lc | z Shear[lb] | lc | Torque[k-ft] | lc | y-y Moment[...] | lc | z-z Moment[...] | lc |
|-----|--------|-----|-----|-----------|----|-------------|----|-------------|----|--------------|----|-----------------|----|-----------------|----|
| 91 | M34 | 1 | max | 2936.65 | 2 | 20.054 | 3 | 42.738 | 2 | 0 | 2 | -.084 | 6 | .049 | 3 |
| 92 | | | min | 2717.156 | 1 | 0 | 1 | 38.524 | 6 | -.006 | 5 | -.092 | 2 | 0 | 1 |
| 93 | | 2 | max | 2936.65 | 2 | 20.054 | 3 | 42.738 | 2 | 0 | 2 | -.052 | 6 | .032 | 3 |
| 94 | | | min | 2717.156 | 1 | 0 | 1 | 38.524 | 6 | -.006 | 5 | -.056 | 2 | 0 | 1 |
| 95 | | 3 | max | 2936.65 | 2 | 20.054 | 3 | 42.738 | 2 | 0 | 2 | -.019 | 1 | .016 | 3 |
| 96 | | | min | 2717.156 | 1 | 0 | 1 | 38.524 | 6 | -.006 | 5 | -.02 | 2 | 0 | 1 |
| 97 | | 4 | max | 2936.65 | 2 | 20.054 | 3 | 42.738 | 2 | 0 | 2 | .015 | 2 | .002 | 4 |
| 98 | | | min | 2717.156 | 1 | 0 | 1 | 38.524 | 6 | -.006 | 5 | .013 | 6 | -.005 | 5 |
| 99 | | 5 | max | 2936.65 | 2 | 20.054 | 3 | 42.738 | 2 | 0 | 2 | .051 | 2 | 0 | 2 |
| 100 | | | min | 2717.156 | 1 | 0 | 1 | 38.524 | 6 | -.006 | 5 | .045 | 6 | -.018 | 3 |
| 101 | M35 | 1 | max | 2697.434 | 2 | 0 | 1 | 0 | 1 | .004 | 4 | -.001 | 6 | .002 | 5 |
| 102 | | | min | 2454.517 | 6 | -4.228 | 4 | -.004 | 6 | 0 | 1 | -.003 | 2 | -.009 | 4 |
| 103 | | 2 | max | 2697.434 | 2 | 0 | 1 | 0 | 1 | .004 | 4 | -.001 | 6 | .002 | 5 |
| 104 | | | min | 2454.517 | 6 | -4.228 | 4 | -.004 | 6 | 0 | 1 | -.003 | 2 | -.005 | 4 |
| 105 | | 3 | max | 2697.434 | 2 | 0 | 1 | 0 | 1 | .004 | 4 | -.001 | 6 | .002 | 5 |
| 106 | | | min | 2454.517 | 6 | -4.228 | 4 | -.004 | 6 | 0 | 1 | -.003 | 2 | -.005 | 3 |
| 107 | | 4 | max | 2697.434 | 2 | 0 | 1 | 0 | 1 | .004 | 4 | -.001 | 6 | .002 | 4 |
| 108 | | | min | 2454.517 | 6 | -4.228 | 4 | -.004 | 6 | 0 | 1 | -.003 | 2 | -.005 | 3 |
| 109 | | 5 | max | 2697.434 | 2 | 0 | 1 | 0 | 1 | .004 | 4 | -.001 | 6 | .006 | 4 |
| 110 | | | min | 2454.517 | 6 | -4.228 | 4 | -.004 | 6 | 0 | 1 | -.003 | 2 | -.005 | 3 |
| 111 | M36 | 1 | max | 2936.65 | 2 | 0 | 1 | -38.532 | 6 | .006 | 5 | .051 | 2 | 0 | 1 |
| 112 | | | min | 2717.156 | 1 | -20.054 | 3 | -42.738 | 2 | 0 | 1 | .045 | 6 | -.018 | 3 |
| 113 | | 2 | max | 2936.65 | 2 | 0 | 1 | -38.532 | 6 | .006 | 5 | .015 | 2 | 0 | 1 |
| 114 | | | min | 2717.156 | 1 | -20.054 | 3 | -42.738 | 2 | 0 | 1 | .013 | 6 | -.005 | 5 |
| 115 | | 3 | max | 2936.65 | 2 | 0 | 1 | -38.532 | 6 | .006 | 5 | -.019 | 1 | .016 | 3 |
| 116 | | | min | 2717.156 | 1 | -20.054 | 3 | -42.738 | 2 | 0 | 1 | -.02 | 2 | 0 | 1 |
| 117 | | 4 | max | 2936.65 | 2 | 0 | 1 | -38.532 | 6 | .006 | 5 | -.052 | 6 | .032 | 3 |
| 118 | | | min | 2717.156 | 1 | -20.054 | 3 | -42.738 | 2 | 0 | 1 | -.056 | 2 | 0 | 1 |
| 119 | | 5 | max | 2936.65 | 2 | 0 | 1 | -38.532 | 6 | .006 | 5 | -.084 | 6 | .049 | 3 |
| 120 | | | min | 2717.156 | 1 | -20.054 | 3 | -42.738 | 2 | 0 | 1 | -.092 | 2 | 0 | 1 |

Envelope AISC 13th ASD Steel Code Checks

| | Member | Shape | Code Check | Loc[in] | lc | Shear ... | Loc[in] | Dir | lc | Pnc/om [lb] | Pnt/om [lb] | Mnyy/om [k-ft] | Mnzz/om ... | Cb | LRFD E... |
|----|--------|----------|------------|---------|----|-----------|---------|-----|----|-------------|-------------|----------------|-------------|------|-----------|
| 1 | M1 | HSS2X1X2 | .959 | 19.875 | 3 | .429 | 7.875 | z | 3 | 9048.826 | 15307.164 | .468 | .768 | 1... | H1-1a |
| 2 | M2 | HSS2X1X2 | .663 | 3.75 | 3 | .107 | 0 | z | 6 | 9048.826 | 15307.164 | .468 | .768 | 1... | H1-1b |
| 3 | M3 | HSS2X1X2 | .455 | 2.188 | 3 | .337 | 0 | z | 3 | 7484.423 | 15307.164 | .468 | .768 | 1... | H1-1a |
| 4 | M4 | HSS2X1X2 | .454 | 21 | 5 | .054 | 0 | z | 4 | 7484.423 | 15307.164 | .468 | .768 | 1... | H1-1a |
| 5 | M5 | HSS2X1X2 | .959 | 19.875 | 3 | .429 | 7.875 | z | 3 | 9048.826 | 15307.164 | .468 | .768 | 1... | H1-1a |
| 6 | M6 | HSS2X1X2 | .663 | 3.75 | 3 | .107 | 0 | z | 6 | 9048.826 | 15307.164 | .468 | .768 | 1... | H1-1b |
| 7 | M7 | HSS2X1X2 | .455 | 39.813 | 3 | .337 | 40.25 | z | 3 | 7484.423 | 15307.164 | .468 | .768 | 1... | H1-1a |
| 8 | M8 | HSS2X1X2 | .831 | 4.125 | 3 | .885 | 4.125 | z | 3 | 9048.826 | 15307.164 | .468 | .768 | 1... | H1-1b |
| 9 | M9 | HSS2X1X2 | .831 | 4.125 | 3 | .885 | 4.125 | z | 3 | 9048.826 | 15307.164 | .468 | .768 | 1... | H1-1b |
| 10 | M34 | HSS2X1X2 | .558 | 0 | 3 | .035 | 0 | z | 5 | 7999.22 | 15307.164 | .468 | .768 | 2... | H1-1a |
| 11 | M35 | HSS2X1X2 | .366 | 0 | 2 | .014 | 0 | z | 4 | 7484.423 | 15307.164 | .468 | .768 | 2... | H1-1a |
| 12 | M36 | HSS2X1X2 | .558 | 40 | 3 | .035 | 0 | z | 5 | 7999.22 | 15307.164 | .468 | .768 | 2... | H1-1a |

Global

| | |
|--|-------|
| Display Sections for Member Calcs | 5 |
| Max Internal Sections for Member Calcs | 97 |
| Include Shear Deformation | Yes |
| Include Warping | Yes |
| Area Load Mesh (in^2) | 144 |
| Merge Tolerance (in) | .12 |
| P-Delta Analysis Tolerance | 0.50% |
| Vertical Axis | Y |

| | |
|------------------------|-----------------|
| Hot Rolled Steel Code | AISC : ASD 13th |
| Cold Formed Steel Code | AISI 99: ASD |
| Wood Code | NDS 91/97: ASD |
| Wood Temperature | < 100F |
| Concrete Code | ACI 2005 |

| | |
|-------------------------------|------------------|
| Number of Shear Regions | 4 |
| Region Spacing Increment (in) | 4 |
| Biaxial Column Method | PCA Load Contour |
| Parame Beta Factor (PCA) | .65 |
| Concrete Stress Block | Rectangular |
| Use Cracked Sections | Yes |
| Bad Framing Warnings | No |
| Unused Force Warnings | Yes |

Hot Rolled Steel Properties

| | Label | E [ksi] | G [ksi] | Nu | Therm (\1E5 F) | Density[k/ft^3] | Yield[ksi] |
|---|----------|---------|---------|----|----------------|-----------------|------------|
| 1 | A500Gr42 | 29000 | 11154 | .3 | .65 | .49 | 42 |
| 2 | SS316 | 28000 | 11154 | .3 | .65 | .49 | 30 |
| 3 | LDX2101 | 28000 | 11154 | .3 | .65 | .49 | 60 |

Hot Rolled Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design Rules | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|--------|--------------|--------|-------------|----------|--------------|---------|-----------|-----------|---------|
| 1 | RAIL | HSS2X1X2 | Beam | Tube | SS316 | Typical | .609 | .092 | .28 | .238 |
| 2 | EPOST | HSS2X1X2 | Column | Tube | LDX2101 | Typical | .609 | .092 | .28 | .238 |
| 3 | EPOST2 | TU1.5x0.75x1 | Column | Tube | SS316 | Typical | .276 | .026 | .078 | .059 |
| 4 | IPOST | HSS2X1X2 | Column | Tube | SS316 | Typical | .609 | .092 | .28 | .238 |

General Material Properties

| | Label | E [ksi] | G [ksi] | Nu | Therm (\1E5 F) | Density[k/ft^3] |
|---|-----------|---------|---------|----|----------------|-----------------|
| 1 | GEN_RIGID | 1e+6 | | .3 | .65 | 0 |

General Section Sets

| | Label | Shape | Type | Material | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|-------|-------|------|-----------|---------|-----------|-----------|---------|
| 1 | LINK | | Beam | GEN_RIGID | .25 | .005 | .005 | .01 |

Basic Load Cases

| | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distributed | Area (Mem... | Surface (Pl... |
|---|-----------------|----------|-----------|-----------|-----------|-------|-------|-------------|--------------|----------------|
| 1 | Cable Prestress | None | | | | 18 | | | | |
| 2 | 1607.7.1.2 | None | | | | 16 | | | | |
| 3 | 1607.7.1 | None | | | | | | 3 | | |
| 4 | 1607.7.1.1 (1) | None | | | | 1 | | | | |
| 5 | 1607.7.1.1 (2) | None | | | | | 1 | | | |
| 6 | 1607.7.1.1 (3) | None | | | | | 1 | | | |

Load Combinations

| | Description | Solve | PDelta | SR... | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor | BLC Factor |
|---|-----------------|-------|--------|-------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1 | Cable Prestress | Yes | C | | 1 | 1 | | | | | | | |
| 2 | 1607.7.1.2 | Yes | C | | 1 | 1 | 2 | 1 | | | | | |
| 3 | 1607.7.1 | Yes | C | | 1 | 1 | 3 | 1 | | | | | |
| 4 | 1607.7.1.1 (1) | Yes | C | | 1 | 1 | 4 | 1 | | | | | |
| 5 | 1607.7.1.1 (2) | Yes | C | | 1 | 1 | 5 | 1 | | | | | |
| 6 | 1607.7.1.1 (3) | Yes | C | | 1 | 1 | 6 | 1 | | | | | |

Member Primary Data

| | Label | I Joint | J Joint | K Joint | Rotate(deg) | Section/Shape | Type | Design List | Material | Design Rules |
|----|-------|---------|---------|---------|-------------|---------------|--------|-------------|-----------|--------------|
| 1 | M1 | N1 | N2 | | 90 | EPOST | Column | Tube | LDX2101 | Typical |
| 2 | M2 | N3 | N4 | | 90 | IPOST | Column | Tube | SS316 | Typical |
| 3 | M3 | N2 | N4 | | 90 | RAIL | Beam | Tube | SS316 | Typical |
| 4 | M4 | N4 | N8 | | 90 | RAIL | Beam | Tube | SS316 | Typical |
| 5 | M5 | N5 | N6 | | 90 | EPOST | Column | Tube | LDX2101 | Typical |
| 6 | M6 | N7 | N8 | | 90 | IPOST | Column | Tube | SS316 | Typical |
| 7 | M7 | N8 | N6 | | 90 | RAIL | Beam | Tube | SS316 | Typical |
| 8 | M8 | N27 | N28 | | 90 | EPOST | Column | Tube | LDX2101 | Typical |
| 9 | M9 | N39 | N40 | | 90 | EPOST | Column | Tube | LDX2101 | Typical |
| 10 | M10 | N1 | N51 | | | LINK | Beam | None | GEN_RIGID | Default |
| 11 | M11 | N39 | N52 | | | LINK | Beam | None | GEN_RIGID | Default |
| 12 | M12 | N51 | N27 | | | LINK | Beam | None | GEN_RIGID | Default |
| 13 | M13 | N52 | N5 | | | LINK | Beam | None | GEN_RIGID | Default |
| 14 | M14 | N9 | N30 | | | LINK | Beam | None | GEN_RIGID | Default |
| 15 | M15 | N11 | N31 | | | LINK | Beam | None | GEN_RIGID | Default |
| 16 | M16 | N13 | N32 | | | LINK | Beam | None | GEN_RIGID | Default |
| 17 | M17 | N15 | N33 | | | LINK | Beam | None | GEN_RIGID | Default |
| 18 | M18 | N17 | N34 | | | LINK | Beam | None | GEN_RIGID | Default |
| 19 | M19 | N19 | N35 | | | LINK | Beam | None | GEN_RIGID | Default |
| 20 | M20 | N21 | N36 | | | LINK | Beam | None | GEN_RIGID | Default |
| 21 | M21 | N23 | N37 | | | LINK | Beam | None | GEN_RIGID | Default |
| 22 | M22 | N25 | N38 | | | LINK | Beam | None | GEN_RIGID | Default |
| 23 | M23 | N42 | N10 | | | LINK | Beam | None | GEN_RIGID | Default |
| 24 | M24 | N43 | N12 | | | LINK | Beam | None | GEN_RIGID | Default |
| 25 | M25 | N44 | N14 | | | LINK | Beam | None | GEN_RIGID | Default |
| 26 | M26 | N45 | N16 | | | LINK | Beam | None | GEN_RIGID | Default |
| 27 | M27 | N46 | N18 | | | LINK | Beam | None | GEN_RIGID | Default |
| 28 | M28 | N47 | N20 | | | LINK | Beam | None | GEN_RIGID | Default |
| 29 | M29 | N48 | N22 | | | LINK | Beam | None | GEN_RIGID | Default |
| 30 | M30 | N49 | N24 | | | LINK | Beam | None | GEN_RIGID | Default |
| 31 | M31 | N50 | N26 | | | LINK | Beam | None | GEN_RIGID | Default |

Member Primary Data (Continued)

| | Label | I Joint | J Joint | K Joint | Rotate(deg) | Section/Shape | Type | Design List | Material | Design Rules |
|----|-------|---------|---------|---------|-------------|---------------|------|-------------|----------|--------------|
| 32 | M32 | N29 | N57 | | 90 | RAIL | Beam | Tube | SS316 | Typical |
| 33 | M33 | N57 | N58 | | 90 | RAIL | Beam | Tube | SS316 | Typical |
| 34 | M34 | N58 | N41 | | 90 | RAIL | Beam | Tube | SS316 | Typical |

Envelope Joint Reactions

| Joint | | | X [lb] | lc | Y [lb] | lc | Z [lb] | lc | MX [k-ft] | lc | MY [k-ft] | lc | MZ [k-ft] | lc |
|-------|---------|-----|----------|----|---------|----|----------|----|-----------|----|-----------|----|-----------|----|
| 1 | N3 | max | -204.704 | 1 | 112.715 | 6 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 2 | | min | -245.376 | 6 | -.067 | 4 | -182.188 | 3 | -.461 | 3 | 0 | 1 | 0 | 1 |
| 3 | N7 | max | 245.328 | 6 | 112.724 | 6 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 4 | | min | 204.704 | 1 | -.067 | 4 | -182.188 | 3 | -.461 | 3 | 0 | 1 | 0 | 1 |
| 5 | N51 | max | 907.026 | 2 | .067 | 4 | 7.229 | 5 | 0 | 1 | 0 | 1 | 0 | 1 |
| 6 | | min | 828.115 | 1 | -12.718 | 6 | -80.312 | 3 | -.406 | 3 | 0 | 1 | 0 | 1 |
| 7 | N52 | max | -828.115 | 1 | .067 | 4 | 15.532 | 4 | .001 | 2 | 0 | 1 | 0 | 1 |
| 8 | | min | -907.026 | 2 | -12.721 | 6 | -80.312 | 3 | -.406 | 3 | 0 | 1 | 0 | 1 |
| 9 | Totals: | max | 0 | 2 | 200 | 6 | 0 | 1 | | | | | | |
| 10 | | min | 0 | 3 | 0 | 2 | -525 | 3 | | | | | | |

Envelope Member Section Forces

| Member | Sec | | Axial[lb] | lc | y Shear[lb] | lc | z Shear[lb] | lc | Torque[k-ft] | lc | y-y Moment[...] | lc | z-z Moment[...] | lc | |
|--------|-----|---|-----------|----------|-------------|----------|-------------|----------|--------------|-------|-----------------|-------|-----------------|-------|---|
| 1 | M1 | 1 | max | -468.692 | 1 | 6.94 | 5 | -140.116 | 6 | .011 | 3 | .05 | 2 | 0 | 1 |
| 2 | | | min | -524.806 | 2 | -31.789 | 3 | -146.97 | 2 | 0 | 1 | .048 | 6 | -.196 | 3 |
| 3 | | 2 | max | 2185.197 | 2 | 50.911 | 5 | -863.069 | 1 | .017 | 3 | -.01 | 6 | 0 | 1 |
| 4 | | | min | 2031.536 | 6 | -12.416 | 2 | -943.592 | 2 | 0 | 1 | -.01 | 2 | -.163 | 3 |
| 5 | | 3 | max | 6172.954 | 2 | 42.586 | 5 | -151.777 | 1 | .018 | 3 | -.085 | 1 | 0 | 1 |
| 6 | | | min | 5623.941 | 1 | -9.988 | 2 | -162.888 | 2 | 0 | 2 | -.094 | 2 | -.115 | 3 |
| 7 | | 4 | max | 4704.644 | 2 | 41.622 | 5 | 515.653 | 2 | .017 | 3 | -.102 | 1 | 0 | 1 |
| 8 | | | min | 4391.845 | 1 | -4.585 | 2 | 460.596 | 6 | 0 | 2 | -.11 | 2 | -.056 | 3 |
| 9 | | 5 | max | 695.729 | 6 | 25.304 | 5 | 819.519 | 2 | .019 | 3 | .087 | 2 | 0 | 2 |
| 10 | | | min | 649.427 | 4 | -1.794 | 2 | 775.702 | 4 | 0 | 2 | .081 | 6 | -.018 | 3 |
| 11 | M2 | 1 | max | 112.715 | 6 | 0 | 1 | -204.704 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 12 | | | min | -.067 | 4 | -182.188 | 3 | -245.513 | 6 | 0 | 1 | 0 | 1 | -.461 | 3 |
| 13 | | 2 | max | 74.582 | 6 | 0 | 1 | 38.506 | 6 | .02 | 5 | -.012 | 1 | 0 | 1 |
| 14 | | | min | -42.32 | 2 | -161.89 | 3 | 17.116 | 1 | 0 | 2 | -.02 | 6 | -.337 | 3 |
| 15 | | 3 | max | 74.582 | 6 | 0 | 1 | 38.538 | 6 | .02 | 5 | .009 | 6 | 0 | 1 |
| 16 | | | min | -42.32 | 2 | -161.89 | 3 | 17.116 | 1 | 0 | 2 | .001 | 1 | -.216 | 3 |
| 17 | | 4 | max | 74.582 | 6 | 2.258 | 2 | 38.352 | 6 | .02 | 5 | .038 | 6 | .002 | 2 |
| 18 | | | min | -42.32 | 2 | -161.89 | 3 | 17.116 | 1 | 0 | 2 | .014 | 1 | -.094 | 3 |
| 19 | | 5 | max | 74.582 | 6 | 2.258 | 2 | 38.352 | 6 | .02 | 5 | .067 | 6 | .039 | 4 |
| 20 | | | min | -42.32 | 2 | -161.89 | 3 | 17.116 | 1 | 0 | 2 | .027 | 1 | 0 | 1 |
| 21 | M3 | 1 | max | 813.087 | 2 | 23.449 | 5 | -643.938 | 4 | 0 | 2 | .087 | 2 | 0 | 2 |
| 22 | | | min | 770.012 | 4 | -1.24 | 2 | -690.131 | 6 | -.018 | 3 | .081 | 6 | -.019 | 3 |
| 23 | | 2 | max | 1801.496 | 2 | 0 | 1 | -25.736 | 6 | 0 | 2 | .073 | 2 | .017 | 3 |
| 24 | | | min | 1695.386 | 6 | -65.232 | 3 | -42.665 | 2 | -.027 | 3 | .064 | 6 | -.021 | 5 |
| 25 | | 3 | max | 1801.496 | 2 | 0 | 1 | -25.736 | 6 | 0 | 2 | .041 | 6 | .055 | 3 |
| 26 | | | min | 1695.386 | 6 | -51.041 | 4 | -42.665 | 2 | -.027 | 3 | .033 | 1 | -.006 | 5 |
| 27 | | 4 | max | 1801.496 | 2 | 22.268 | 3 | -25.736 | 6 | 0 | 2 | .019 | 6 | .089 | 4 |
| 28 | | | min | 1695.386 | 6 | -51.041 | 4 | -42.665 | 2 | -.027 | 3 | -.001 | 2 | 0 | 1 |
| 29 | | 5 | max | 1801.496 | 2 | 66.018 | 3 | -25.736 | 6 | 0 | 2 | -.004 | 6 | .134 | 4 |
| 30 | | | min | 1695.386 | 6 | -51.041 | 4 | -42.665 | 2 | -.027 | 3 | -.039 | 2 | 0 | 1 |
| 31 | M4 | 1 | max | 1820.009 | 2 | 48.371 | 4 | 0 | 1 | .018 | 4 | .063 | 6 | .131 | 4 |

Envelope Member Section Forces (Continued)

| Member | Sec | | Axial[lb] | lc | y Shear[lb] | lc | z Shear[lb] | lc | Torque[k-ft] | lc | y-y Moment[...] | lc | z-z Moment[...] | lc | |
|--------|-----|-----|-----------|----------|-------------|--------|-------------|----------|--------------|------|-----------------|-------|-----------------|------|---|
| 32 | | min | 1719.587 | 4 | -100 | 5 | -99.993 | 6 | 0 | 1 | -.009 | 2 | 0 | 1 | |
| 33 | 2 | max | 1820.009 | 2 | 48.371 | 4 | 0 | 1 | .018 | 4 | -.009 | 1 | .091 | 5 | |
| 34 | | min | 1719.587 | 4 | -100 | 5 | -99.993 | 6 | 0 | 1 | -.025 | 6 | 0 | 1 | |
| 35 | 3 | max | 1820.009 | 2 | 100 | 5 | 100.007 | 6 | .018 | 4 | -.009 | 1 | .178 | 5 | |
| 36 | | min | 1719.587 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.112 | 6 | 0 | 1 | |
| 37 | 4 | max | 1820.009 | 2 | 100 | 5 | 100.007 | 6 | .018 | 4 | -.009 | 1 | .091 | 5 | |
| 38 | | min | 1719.587 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.025 | 6 | -.001 | 2 | |
| 39 | 5 | max | 1820.009 | 2 | 100 | 5 | 100.007 | 6 | .018 | 4 | .063 | 6 | .003 | 5 | |
| 40 | | min | 1719.587 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.009 | 2 | -.038 | 4 | |
| 41 | M5 | 1 | max | -468.692 | 1 | 9.115 | 4 | 146.97 | 2 | 0 | -.048 | 6 | 0 | 2 | |
| 42 | | min | -524.806 | 2 | -31.789 | 3 | 140.117 | 6 | -.011 | 3 | -.05 | 2 | -.196 | 3 | |
| 43 | 2 | max | 2185.197 | 2 | 50.911 | 5 | 943.592 | 2 | 0 | 1 | .01 | 2 | 0 | 2 | |
| 44 | | min | 2031.548 | 6 | 0 | 1 | 863.069 | 1 | -.017 | 3 | .01 | 6 | -.163 | 3 | |
| 45 | 3 | max | 6172.954 | 2 | 42.586 | 5 | 162.888 | 2 | 0 | 1 | .094 | 2 | 0 | 2 | |
| 46 | | min | 5623.941 | 1 | -3.181 | 3 | 151.777 | 1 | -.018 | 3 | .085 | 1 | -.115 | 3 | |
| 47 | 4 | max | 4704.644 | 2 | 41.622 | 5 | -460.597 | 6 | 0 | 1 | .11 | 2 | 0 | 1 | |
| 48 | | min | 4391.845 | 1 | -3.304 | 3 | -515.653 | 2 | -.017 | 3 | .102 | 1 | -.056 | 3 | |
| 49 | 5 | max | 695.727 | 6 | 25.304 | 5 | -775.702 | 4 | 0 | 1 | -.081 | 6 | 0 | 1 | |
| 50 | | min | 649.427 | 4 | 0 | 1 | -819.519 | 2 | -.019 | 3 | -.087 | 2 | -.018 | 3 | |
| 51 | M6 | 1 | max | 112.724 | 6 | 0 | 245.465 | 6 | 0 | 1 | 0 | 1 | 0 | 1 | |
| 52 | | min | -.067 | 4 | -182.188 | 3 | 204.704 | 1 | 0 | 1 | 0 | 1 | -.461 | 3 | |
| 53 | 2 | max | 74.591 | 6 | 0 | 1 | -17.116 | 1 | 0 | 1 | .02 | 6 | 0 | 1 | |
| 54 | | min | -42.32 | 2 | -161.89 | 3 | -38.448 | 6 | -.02 | 5 | .012 | 1 | -.337 | 3 | |
| 55 | 3 | max | 74.591 | 6 | 0 | 1 | -17.116 | 1 | 0 | 1 | -.001 | 1 | 0 | 1 | |
| 56 | | min | -42.32 | 2 | -161.89 | 3 | -38.448 | 6 | -.02 | 5 | -.009 | 6 | -.216 | 3 | |
| 57 | 4 | max | 74.591 | 6 | 0 | 1 | -17.116 | 1 | 0 | 1 | -.014 | 1 | 0 | 1 | |
| 58 | | min | -42.32 | 2 | -161.89 | 3 | -38.448 | 6 | -.02 | 5 | -.038 | 6 | -.094 | 3 | |
| 59 | 5 | max | 74.591 | 6 | 0 | 1 | -17.116 | 1 | 0 | 1 | -.027 | 1 | .027 | 3 | |
| 60 | | min | -42.32 | 2 | -161.89 | 3 | -38.448 | 6 | -.02 | 5 | -.067 | 6 | 0 | 2 | |
| 61 | M7 | 1 | max | 1801.496 | 2 | 16.735 | 5 | 42.665 | 2 | .027 | 3 | -.004 | 6 | .023 | 5 |
| 62 | | min | 1695.39 | 6 | -66.018 | 3 | 25.741 | 6 | 0 | 1 | -.039 | 2 | -.019 | 4 | |
| 63 | 2 | max | 1801.496 | 2 | 16.735 | 5 | 42.665 | 2 | .027 | 3 | .019 | 6 | .055 | 3 | |
| 64 | | min | 1695.39 | 6 | -22.268 | 3 | 25.741 | 6 | 0 | 1 | -.001 | 2 | -.02 | 4 | |
| 65 | 3 | max | 1801.496 | 2 | 21.482 | 3 | 42.665 | 2 | .027 | 3 | .041 | 6 | .055 | 3 | |
| 66 | | min | 1695.39 | 6 | -.32 | 2 | 25.741 | 6 | 0 | 1 | .033 | 1 | -.02 | 4 | |
| 67 | 4 | max | 1801.496 | 2 | 65.232 | 3 | 42.665 | 2 | .027 | 3 | .073 | 2 | .017 | 3 | |
| 68 | | min | 1695.39 | 6 | -.32 | 2 | 25.741 | 6 | 0 | 1 | .064 | 6 | -.021 | 5 | |
| 69 | 5 | max | 813.087 | 2 | 0 | 1 | 690.129 | 6 | .018 | 3 | .087 | 2 | 0 | 1 | |
| 70 | | min | 770.012 | 4 | -23.449 | 5 | 643.938 | 4 | 0 | 1 | .081 | 6 | -.019 | 3 | |
| 71 | M8 | 1 | max | 524.852 | 2 | .115 | 5 | 1051.844 | 2 | 0 | -.126 | 1 | 0 | 1 | |
| 72 | | min | 468.758 | 1 | -49.491 | 3 | 967.706 | 1 | -.013 | 3 | -.138 | 2 | -.21 | 3 | |
| 73 | 2 | max | -2001.108 | 1 | 0 | 1 | -648.026 | 1 | .02 | 3 | -.039 | 1 | 0 | 1 | |
| 74 | | min | -2142.877 | 2 | -137.665 | 3 | -711.148 | 2 | 0 | 1 | -.042 | 2 | -.168 | 3 | |
| 75 | 3 | max | -5584.743 | 1 | 0 | 1 | -151.774 | 1 | .018 | 3 | -.085 | 1 | 0 | 1 | |
| 76 | | min | -6130.634 | 2 | -143.823 | 3 | -162.884 | 2 | 0 | 2 | -.094 | 2 | -.12 | 3 | |
| 77 | 4 | max | -4352.648 | 1 | .007 | 2 | 515.686 | 2 | .018 | 3 | -.102 | 1 | 0 | 1 | |
| 78 | | min | -4662.324 | 2 | -142.031 | 3 | 460.617 | 6 | 0 | 2 | -.11 | 2 | -.065 | 3 | |
| 79 | 5 | max | -610.229 | 4 | .478 | 2 | 988.409 | 2 | .022 | 3 | .13 | 2 | 0 | 2 | |
| 80 | | min | -670.318 | 6 | -108.377 | 3 | 919.077 | 6 | 0 | 2 | .116 | 6 | -.012 | 5 | |
| 81 | M9 | 1 | max | 524.852 | 2 | 6.392 | 4 | -967.706 | 1 | .013 | 3 | .138 | 2 | 0 | 2 |
| 82 | | min | 468.758 | 1 | -49.491 | 3 | -1051.844 | 2 | 0 | 1 | .126 | 1 | -.21 | 3 | |
| 83 | 2 | max | -2001.108 | 1 | 0 | 1 | 711.148 | 2 | 0 | 1 | .042 | 2 | 0 | 2 | |
| 84 | | min | -2142.877 | 2 | -137.665 | 3 | 648.026 | 1 | -.02 | 3 | .039 | 1 | -.168 | 3 | |

Envelope Member Section Forces (Continued)

| Member | Sec | | Axial[lb] | lc | y Shear[lb] | lc | z Shear[lb] | lc | Torque[k-ft] | lc | y-y Moment[...] | lc | z-z Moment[...] | lc | |
|--------|-----|-----|-----------|----------|-------------|--------|-------------|---------|--------------|------|-----------------|-------|-----------------|-----|---|
| 85 | 3 | max | -5584.743 | 1 | 0 | 1 | 162.884 | 2 | 0 | 1 | .094 | 2 | 0 | 1 | |
| 86 | | min | -6130.634 | 2 | -143.823 | 3 | 151.774 | 1 | -.018 | 3 | .085 | 1 | -.12 | 3 | |
| 87 | 4 | max | -4352.648 | 1 | 0 | 1 | -460.617 | 6 | 0 | 1 | .11 | 2 | 0 | 1 | |
| 88 | | min | -4662.324 | 2 | -142.031 | 3 | -515.686 | 2 | -.018 | 3 | .102 | 1 | -.065 | 3 | |
| 89 | 5 | max | -610.229 | 4 | 0 | 1 | -919.079 | 6 | 0 | 1 | -.116 | 6 | 0 | 1 | |
| 90 | | min | -670.311 | 6 | -108.377 | 3 | -988.409 | 2 | -.022 | 3 | -.13 | 2 | -.012 | 5 | |
| 91 | M32 | 1 | max | 2945.93 | 2 | 20.372 | 3 | 42.703 | 2 | 0 | 2 | -.084 | 6 | .05 | 3 |
| 92 | | min | 2725.643 | 1 | 0 | 1 | 38.494 | 6 | -.006 | 5 | -.091 | 2 | 0 | 1 | |
| 93 | 2 | max | 2945.93 | 2 | 20.372 | 3 | 42.703 | 2 | 0 | 2 | -.052 | 6 | .033 | 3 | |
| 94 | | min | 2725.643 | 1 | 0 | 1 | 38.494 | 6 | -.006 | 5 | -.056 | 2 | 0 | 1 | |
| 95 | 3 | max | 2945.93 | 2 | 20.372 | 3 | 42.703 | 2 | 0 | 2 | -.019 | 1 | .016 | 3 | |
| 96 | | min | 2725.643 | 1 | 0 | 1 | 38.494 | 6 | -.006 | 5 | -.02 | 2 | 0 | 1 | |
| 97 | 4 | max | 2945.93 | 2 | 20.372 | 3 | 42.703 | 2 | 0 | 2 | .015 | 2 | .001 | 4 | |
| 98 | | min | 2725.643 | 1 | 0 | 1 | 38.494 | 6 | -.006 | 5 | .013 | 6 | -.005 | 5 | |
| 99 | 5 | max | 2945.93 | 2 | 20.372 | 3 | 42.703 | 2 | 0 | 2 | .051 | 2 | 0 | 2 | |
| 100 | | min | 2725.643 | 1 | 0 | 1 | 38.494 | 6 | -.006 | 5 | .045 | 6 | -.018 | 3 | |
| 101 | M33 | 1 | max | 2706.047 | 2 | 0 | 0 | 1 | .005 | 4 | -.001 | 6 | .002 | 5 | |
| 102 | | min | 2462.41 | 6 | -4.344 | 4 | -.005 | 6 | 0 | 1 | -.003 | 2 | -.009 | 4 | |
| 103 | 2 | max | 2706.047 | 2 | 0 | 1 | 0 | 1 | .005 | 4 | -.001 | 6 | .002 | 5 | |
| 104 | | min | 2462.41 | 6 | -4.344 | 4 | -.005 | 6 | 0 | 1 | -.003 | 2 | -.005 | 4 | |
| 105 | 3 | max | 2706.047 | 2 | 0 | 1 | 0 | 1 | .005 | 4 | -.001 | 6 | .002 | 5 | |
| 106 | | min | 2462.41 | 6 | -4.344 | 4 | -.005 | 6 | 0 | 1 | -.003 | 2 | -.005 | 3 | |
| 107 | 4 | max | 2706.047 | 2 | 0 | 1 | 0 | 1 | .005 | 4 | -.001 | 6 | .002 | 4 | |
| 108 | | min | 2462.41 | 6 | -4.344 | 4 | -.005 | 6 | 0 | 1 | -.003 | 2 | -.005 | 3 | |
| 109 | 5 | max | 2706.047 | 2 | 0 | 1 | 0 | 1 | .005 | 4 | -.001 | 6 | .006 | 4 | |
| 110 | | min | 2462.41 | 6 | -4.344 | 4 | -.005 | 6 | 0 | 1 | -.003 | 2 | -.005 | 3 | |
| 111 | M34 | 1 | max | 2945.93 | 2 | 0 | 1 | -38.502 | 6 | .006 | 5 | .051 | 2 | 0 | 1 |
| 112 | | min | 2725.643 | 1 | -20.372 | 3 | -42.703 | 2 | 0 | 1 | .045 | 6 | -.018 | 3 | |
| 113 | 2 | max | 2945.93 | 2 | 0 | 1 | -38.502 | 6 | .006 | 5 | .015 | 2 | 0 | 1 | |
| 114 | | min | 2725.643 | 1 | -20.372 | 3 | -42.703 | 2 | 0 | 1 | .013 | 6 | -.005 | 5 | |
| 115 | 3 | max | 2945.93 | 2 | 0 | 1 | -38.502 | 6 | .006 | 5 | -.019 | 1 | .016 | 3 | |
| 116 | | min | 2725.643 | 1 | -20.372 | 3 | -42.703 | 2 | 0 | 1 | -.02 | 2 | 0 | 1 | |
| 117 | 4 | max | 2945.93 | 2 | 0 | 1 | -38.502 | 6 | .006 | 5 | -.052 | 6 | .033 | 3 | |
| 118 | | min | 2725.643 | 1 | -20.372 | 3 | -42.703 | 2 | 0 | 1 | -.056 | 2 | 0 | 1 | |
| 119 | 5 | max | 2945.93 | 2 | 0 | 1 | -38.502 | 6 | .006 | 5 | -.084 | 6 | .05 | 3 | |
| 120 | | min | 2725.643 | 1 | -20.372 | 3 | -42.703 | 2 | 0 | 1 | -.091 | 2 | 0 | 1 | |

Envelope AISC 13th ASD Steel Code Checks

| Member | Shape | Code Check | Loc[in] | lc | Shear ... | Loc[in] | Dir | lc | Pnc/om [lb] | Pnt/om [lb] | Mnyy/om [k-ft] | Mnzz/om ... | Cb | LRFD E... | |
|--------|-------|------------|---------|--------|-----------|---------|-------|----|-------------|-------------|----------------|-------------|-------|-----------|-------|
| 1 | M1 | HSS2X1X2 | .797 | 19.875 | 3 | .301 | 7.875 | z | 3 | 10046.209 | 21867.377 | .668 | 1.097 | 1... | H1-1a |
| 2 | M2 | HSS2X1X2 | .928 | 3.75 | 3 | .150 | 0 | z | 6 | 7410.874 | 10933.689 | .334 | .549 | 1... | H1-1b |
| 3 | M3 | HSS2X1X2 | .583 | 2.188 | 3 | .474 | 0 | z | 3 | 6439.989 | 10933.689 | .334 | .549 | 1... | H1-1a |
| 4 | M4 | HSS2X1X2 | .579 | 21 | 5 | .078 | 0 | z | 4 | 6439.989 | 10933.689 | .334 | .549 | 1... | H1-1a |
| 5 | M5 | HSS2X1X2 | .797 | 19.875 | 3 | .301 | 7.875 | z | 3 | 10046.209 | 21867.377 | .668 | 1.097 | 1... | H1-1a |
| 6 | M6 | HSS2X1X2 | .928 | 3.75 | 3 | .150 | 0 | z | 6 | 7410.874 | 10933.689 | .334 | .549 | 1... | H1-1b |
| 7 | M7 | HSS2X1X2 | .583 | 39.813 | 3 | .474 | 40.25 | z | 3 | 6439.989 | 10933.689 | .334 | .549 | 1... | H1-1a |
| 8 | M8 | HSS2X1X2 | .590 | 4.125 | 3 | .622 | 4.125 | z | 3 | 10046.209 | 21867.377 | .668 | 1.097 | 1... | H1-1b |
| 9 | M9 | HSS2X1X2 | .590 | 4.125 | 3 | .622 | 4.125 | z | 3 | 10046.209 | 21867.377 | .668 | 1.097 | 1... | H1-1b |
| 10 | M32 | HSS2X1X2 | .709 | 0 | 3 | .050 | 0 | z | 5 | 6764.837 | 10933.689 | .334 | .549 | 2... | H1-1a |
| 11 | M33 | HSS2X1X2 | .428 | 0 | 2 | .020 | 0 | z | 4 | 6439.989 | 10933.689 | .334 | .549 | 2... | H1-1a |
| 12 | M34 | HSS2X1X2 | .709 | 40 | 3 | .050 | 0 | z | 5 | 6764.837 | 10933.689 | .334 | .549 | 2... | H1-1a |

*** End of Calculations ***