

STATE OF CONNECTICUT *CONNECTICUT SITING COUNCIL* Ten Franklin Square, New Britain, CT 06051 Phone: (860) 827-2935 Fax: (860) 827-2950 E-Mail: siting.council@ct.gov Web Site: portal.ct.gov/csc

### VIA ELECTRONIC MAIL

April 21, 2023

Paul R. Michaud, Esq. Michaud Law Group LLC 515 Centerpoint Dr., Suite 502 Middletown, CT 06457 pmichaud@michaud.law

RE: **PETITION NO. 1492** – CT NSB ProjectCo LLC declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 1.99-megawatt AC solar photovoltaic electric generating facility located at 486 Fitch Hill Road, Montville (Uncasville), Connecticut, and associated electrical interconnection.

Dear Attorney Michaud:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated April 20, 2023, regarding compliance with Condition No. 3 of the Council's Declaratory Ruling issued on June 24, 2022 for the above-referenced facility. The correspondence includes the final structural design of the racking system, stamped by a Professional Engineer duly licensed in the State of Connecticut, in accordance with Condition No. 3.

Therefore, the Council acknowledges that Condition No. 3 has been satisfied. This acknowledgment applies only to the condition satisfied by the April 20, 2023 correspondence.

Please be advised that deviations from the standards established by the Council in the Declaratory Ruling are enforceable under the provisions of Connecticut General Statutes §16-50u.

Thank you for your attention and cooperation.

Sincerely,

Muliiphael

Melanie A. Bachman Executive Director

MB/RDM/laf



PAUL R. MICHAUD Managing Attorney / Principal 515 Centerpoint Drive, Suite 503 Middletown, CT 06457 Direct Telephone: (860) 338-3728 Email: pmichaud@michaud.law Web: www.michaudlaw.com

April 20, 2023

### FILED BY ELECTRONIC MAIL AND US MAIL

Melanie Bachman, Esq. Executive Director Connecticut Siting Council 10 Franklin Square New Britain, CT 06051

Re: **PETITION NO. 1492** – CT NSB ProjectCo LLC petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 1.99-megawatt AC solar photovoltaic electric generating facility located at 486 Fitch Hill Road, Montville (Uncasville), Connecticut, and associated electrical interconnection.

Dear Attorney Bachman:

On behalf of CT NSB ProjectCo LLC ("Petitioner"), this letter to the Connecticut Siting Council ("Council") is in response to Council's Petition No. 1492 Decision dated June 24, 2022 ("Decision"), specifically Condition #3.

Enclosed – and in response to Condition #3 of the Decision – please find a copy of the final structural design for the racking system stamped by a Connecticut Professional Engineer. Petitioner believes they have satisfied the Conditions required to construct the solar panel racking system; however, Petitioner will refrain from doing so until they receive Council's acknowledgement.

Consistent with Council requirements, Petitioner submits one electronic version, an original, and fifteen hard copies of all necessary documents.

Please feel free to contact me if you have any questions.

Very truly yours,

Paul R. michaul

Paul R. Michaud



Prepared For:

SOLV Inc.

North Silver Brook Solar Project







A product of Northern States Metals (NSM) 3207 Innovation Place, Youngstown, Ohio, 44509-4023

Prepared By: NZ Checked By: JS



Rev 0



Solar FlexRack Engineering Analysis

### **Table of Contents**

| Inputs                                                                   | Page # |  |  |  |  |  |
|--------------------------------------------------------------------------|--------|--|--|--|--|--|
| Tracker Load Sheet                                                       | 1      |  |  |  |  |  |
| Global Parameters                                                        | 2-3    |  |  |  |  |  |
| Load Combinations                                                        |        |  |  |  |  |  |
| Loads at 0° (Stow Position) – 1x53 (Configuration Controls Rack, Post)   |        |  |  |  |  |  |
| Isometric View                                                           | 5      |  |  |  |  |  |
| Solar Panel Dead Load                                                    | 6      |  |  |  |  |  |
| Projected Snow Load                                                      | 7      |  |  |  |  |  |
| Seismic Design X-Direction                                               | 8      |  |  |  |  |  |
| Seismic Design Z-Direction                                               | 9      |  |  |  |  |  |
| Static - Wind Uplift Load                                                | 10     |  |  |  |  |  |
| Static – Wind Downward Load                                              | 11     |  |  |  |  |  |
| Inertial – Wind Uplift Load                                              | 12     |  |  |  |  |  |
| Inertial – Wind Downward Load                                            |        |  |  |  |  |  |
| Results at 0° (Stow Position) – 1x53 (Configuration Controls Rack, Post) |        |  |  |  |  |  |
| Hot Rolled Code Check                                                    | 14     |  |  |  |  |  |
| Main Beam Code Check (HSS Member Detail)                                 | 15-16  |  |  |  |  |  |
| Vertical Rail Code Check (Rolled Hat Channel Detail)                     | 17-18  |  |  |  |  |  |
| Drive Post Code Check                                                    |        |  |  |  |  |  |
| Idler Post Code Check                                                    |        |  |  |  |  |  |
| Loads at 55° – 1x53 (Configuration Controls Rack, Post)                  |        |  |  |  |  |  |
| Isometric View                                                           | 23     |  |  |  |  |  |
| Solar Panel Dead Load                                                    | 24     |  |  |  |  |  |
| Projected Snow Load                                                      | 25     |  |  |  |  |  |
| Seismic Design X-Direction                                               | 26     |  |  |  |  |  |
| Seismic Design Z-Direction                                               | 27     |  |  |  |  |  |
| Static - Wind Uplift Load                                                | 28     |  |  |  |  |  |
| Static – Wind Downward Load                                              | 29     |  |  |  |  |  |
| Inertial – Wind Uplift Load                                              | 30     |  |  |  |  |  |
| Inertial – Wind Downward Load                                            | 31     |  |  |  |  |  |



### Solar FlexRack Engineering Analysis

| Results at 55° – 1x53 (Configuration Controls Rack, Post) |       |  |  |  |  |
|-----------------------------------------------------------|-------|--|--|--|--|
| Hot Rolled Code Check                                     | 32    |  |  |  |  |
| Main Beam Code Check (HSS Member Detail)                  | 33-34 |  |  |  |  |
| Vertical Rail Code Check (Rolled Hat Channel Detail)      | 35-36 |  |  |  |  |
| Drive Post Code Check                                     | 37-38 |  |  |  |  |
| Idler Post Code Check                                     | 39-40 |  |  |  |  |

| Customer:         | Solv Inc.                                                    |
|-------------------|--------------------------------------------------------------|
| SFDC ID #:        | 17010                                                        |
| Project/Location: | North Silver Brook - 486 Fitch Hill Rd. Uncasville, CT 06382 |
| Date/Engineer:    | 01/20/23 - JS                                                |

### Solar Flexrack Loading Analysis

### **Configuration Data**

| Configuration 1:     | 1x53 FTS                | Configuration 2:     | 1x41 FTS                | Configuration 3:     | 1x35 FTS                |  |
|----------------------|-------------------------|----------------------|-------------------------|----------------------|-------------------------|--|
| Horiz. Length (N-S): | 195.74 ft               | Horiz. Length (N-S): | 151.73 ft               | Horiz. Length (N-S): | 129.73 ft               |  |
| Array Surface Area:  | 1530.96 ft <sup>2</sup> | Array Surface Area:  | 1186.79 ft <sup>2</sup> | Array Surface Area:  | 1014.70 ft <sup>2</sup> |  |
| Number of Posts:     | 9                       | Number of Posts:     | 7                       | Number of Posts:     | 7                       |  |

Snow Load Design

### Design Data Summary

| Module Length:           | 7.82 ft  |
|--------------------------|----------|
| Solar Panel Dead Load:   | 2.56 psf |
| Max Stow Wind Speed:     | 122 mph  |
| Max Operation:           | 35 mph   |
| Snow Load:               | 30 psf   |
| Ground Clearance:        | 36.82 in |
| Exposure Category:       | С        |
| Building Classification: | 1        |
| -                        |          |

### Snow Load Parameters

| Flat Roof Snow Load, Pr:    | Pf=0.7*Ce*Ct*I*Pg | 1 [ | Tilt Angle | c    | P nsf |
|-----------------------------|-------------------|-----|------------|------|-------|
| Sloped Roof Snow Load, Ps:  | Ps = Pf*Cs        |     | 0 - 15     | 1.00 | 18.14 |
|                             |                   |     | 20         | 0.91 | 16.51 |
| Snow Exposure Category, Ce: | 0.9               |     | 25         | 0.82 | 14.88 |
| Snow Thermal Factor, Ct:    | 1.2               |     | 30         | 0.73 | 13.25 |
| Snow Importance Factor, I:  | 0.8               |     | 35         | 0.64 | 11.61 |
| P <sub>f</sub> :            | 18.14 psf         |     | 40         | 0.55 | 9.98  |
|                             |                   |     | 45         | 0.46 | 8.35  |
| Snow Density:               | 17.9 pcf          |     | 50         | 0.37 | 6.71  |
| Snow Height:                | 20.11 in          |     | 55         | 0.28 | 5.08  |

### "A" EL

### Wind Load Parameters

| Exposure Coefficient, Kz:       | 0.85 | Wind Load: qh = 0.00256*kz*kzt*kd*V <sup>2</sup> | n:            | 2.9   | Hz |
|---------------------------------|------|--------------------------------------------------|---------------|-------|----|
| Topographic Factor, Kzt:        | 1.00 | qh <sub>Vult</sub> 27.53 psf                     | Damping Ratio | 2.50  | %  |
| Wind Directionality Factor, Kd: | 0.85 | qh <sub>35</sub> 3.77 psf                        | nL/Vult:      | 0.164 |    |
|                                 |      |                                                  | nL/V35:       | 0.442 |    |
|                                 |      |                                                  |               |       |    |

### Wind Load Design

|            | Perimeter Loading |                |        |        |             |             |             |                   |                |                |             |         |         |             |             |             |             |
|------------|-------------------|----------------|--------|--------|-------------|-------------|-------------|-------------------|----------------|----------------|-------------|---------|---------|-------------|-------------|-------------|-------------|
|            | Stow              |                |        |        |             |             |             |                   |                |                |             |         |         |             |             |             |             |
|            | Static            |                |        |        |             |             |             |                   |                |                |             | Inertia |         |             |             |             |             |
| Tilt Angle | A Distribution    | B Distribution | GCp Up | GCp Dn | A*qz*GCp Up | B*qz*GCp Up | A*qz*GCp Dn | B*qz*GCp Dn       | A Distribution | B Distribution | Mod. Factor | GCp Up  | GCp Dn  | A*qz*GCp Up | B*qz*GCp Up | A*qz*GCp Dn | B*qz*GCp Dn |
| 0          | 2.00              | 0.00           | -0.38  | 0.27   | -20.73      | 0.00        | 14.76       | 0.00              | 1.18           | 0.82           | 0.58        | -0.96   | 0.85    | -31.09      | -21.61      | 27.57       | 19.16       |
|            |                   |                |        | -      |             |             |             |                   |                |                |             |         |         |             |             |             |             |
|            |                   |                |        |        |             |             |             | Tilted Position ( | 35 mph max)    |                |             |         |         |             |             |             |             |
|            |                   |                |        |        | Static      |             |             |                   |                |                |             |         | Inertia |             |             |             |             |
| Tilt Angle | A Distribution    | B Distribution | GCp Up | GCp Dn | A*qz*GCp Up | B*qz*GCp Up | A*qz*GCp Dn | B*qz*GCp Dn       | A Distribution | B Distribution | Mod. Factor | GCp Up  | GCp Dn  | A*qz*GCp Up | B*qz*GCp Up | A*qz*GCp Dn | B*qz*GCp Dn |
| 5          | 1.95              | 0.05           | -0.56  | 0.54   | -4.14       | -0.12       | 3.93        | 0.11              | 1.85           | 0.15           | 0.30        | -0.87   | 0.84    | -6.06       | -0.49       | 5.86        | 0.47        |
| 10         | 1.89              | 0.11           | -0.76  | 0.68   | -5.44       | -0.32       | 4.84        | 0.28              | 1.85           | 0.15           | 0.30        | -1.07   | 0.98    | -7.44       | -0.60       | 6.85        | 0.55        |
| 15         | 1.84              | 0.17           | -0.71  | 0.89   | -4.91       | -0.44       | 6.18        | 0.56              | 2.00           | 0.00           | 0.06        | -0.77   | 0.95    | -5.81       | 0.00        | 7.20        | 0.00        |
| 20         | 1.78              | 0.22           | -0.79  | 0.92   | -5.33       | -0.66       | 6.15        | 0.76              | 2.00           | 0.00           | 0.06        | -0.86   | 0.98    | -6.45       | 0.00        | 7.37        | 0.00        |
| 25         | 1.73              | 0.28           | -0.79  | 0.84   | -5.17       | -0.82       | 5.50        | 0.88              | 2.00           | 0.00           | 0.06        | -0.86   | 0.91    | -6.45       | 0.00        | 6.84        | 0.00        |
| 30         | 1.67              | 0.33           | -0.80  | 0.78   | -5.07       | -1.00       | 4.94        | 0.98              | 2.00           | 0.00           | 0.06        | -0.87   | 0.85    | -6.53       | 0.00        | 6.38        | 0.00        |
| 35         | 1.62              | 0.39           | -0.81  | 0.93   | -4.94       | -1.18       | 5.69        | 1.36              | 2.00           | 0.00           | 0.06        | -0.87   | 0.99    | -6.58       | 0.00        | 7.50        | 0.00        |
| 40         | 1.56              | 0.44           | -0.88  | 0.87   | -5.21       | -1.47       | 5.11        | 1.44              | 2.00           | 0.00           | 0.06        | -0.95   | 0.93    | -7.14       | 0.00        | 7.01        | 0.00        |
| 45         | 1.51              | 0.50           | -0.90  | 0.92   | -5.10       | -1.68       | 5.23        | 1.72              | 2.00           | 0.00           | 0.06        | -0.96   | 0.98    | -7.24       | 0.00        | 7.41        | 0.00        |
| 50         | 1.45              | 0.55           | -0.90  | 0.92   | -4.92       | -1.86       | 5.04        | 1.91              | 2.00           | 0.00           | 0.06        | -0.96   | 0.98    | -7.24       | 0.00        | 7.41        | 0.00        |
| 55         | 1.40              | 0.61           | -0.98  | 1.02   | -5.17       | -2.24       | 5.39        | 2.34              | 2.00           | 0.00           | 0.06        | -1.04   | 1.09    | -7.88       | 0.00        | 8.19        | 0.00        |

### Seismic Load Parameters / Design

| S <sub>S</sub> :                     | 0.167 | S <sub>DS:</sub> S <sub>DS</sub> = (2/3) x F <sub>a</sub> x S <sub>S</sub> | Site Class: D                           |                                                                                                |
|--------------------------------------|-------|----------------------------------------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------|
| S <sub>1</sub> :                     | 0.060 | S <sub>DS:</sub> 0.178                                                     | Seismic Design Category: B              | This Base Shear Value represents the seismic effect of the panel weight on the rack. This Base |
| Site Coefficient, Fa:                | 1.600 | S <sub>D1:</sub> S <sub>D1</sub> = (2/3) x F <sub>V</sub> x S <sub>S</sub> |                                         | Shear includes 20% of the design snow load when the flat roof snow load exceeds 30 psf per     |
| Site Coefficient, F <sub>V:</sub>    | 2.400 | S <sub>D1:</sub> 0.096                                                     | Seismic Response Coefficient, Cs: 0.089 | ASCE. A separate term in the Risa load combination accounts for the remaining Dead Load        |
| Response Modification Coefficent, R: | 2     | Cu = 1.7                                                                   | Panel Seismic Load, V = Cs x (Panel DL) | caused by member self-weight.                                                                  |
| Importance Factor, I <sub>e:</sub>   | 1     | TL = 6                                                                     | V = 0.228 psf                           |                                                                                                |

Note: GCp values for 20° and 45° were not given in results from RWDI and are assumed to be the higher value of the two adjacent values.

Loading analysis and design in accordance with wind and snow load information obtained from ASCE 7-10 Minimum Design Loads for Building and Other Structures





| Model Settings                                     |                                     |
|----------------------------------------------------|-------------------------------------|
| Solution                                           |                                     |
| Members                                            |                                     |
| Number of Reported Sections                        | 20                                  |
| Number of Internal Sections                        | 20                                  |
| Member Area Load Mesh Size (in <sup>2</sup> )      | 1                                   |
| Consider Shear Deformation                         |                                     |
| Consider Torsional Warning                         | Vec                                 |
|                                                    | 165                                 |
|                                                    |                                     |
| Approximate Mesh Size (in)                         | 12                                  |
| Transfer Forces Between Intersecting Wood Walls    | Yes                                 |
| Increase Wood Wall Nailing Canacity for Wind Loads | Yes                                 |
| Include P-Delta for Walls                          | Yes                                 |
| Optimize Masonry and Wood Walls                    | Yes                                 |
| Maximum Number of Iterations                       | 3                                   |
|                                                    |                                     |
| Processor Core Utilization                         |                                     |
| Single                                             | No                                  |
| Multiple (Optimum)                                 | Yes                                 |
| Maximum                                            | No                                  |
| Maximum                                            |                                     |
| Axis                                               |                                     |
| Vertical Global Axis                               |                                     |
| Global Axis corresponding to vertical direction    | Υ                                   |
| Convert Existing Data                              | Yes                                 |
|                                                    |                                     |
| Default Member Orientation                         |                                     |
| Default Global Plane for z-axis                    | XZ                                  |
|                                                    |                                     |
| Plate Axis                                         |                                     |
| Plate Local Axis Orientation                       | Nodal                               |
|                                                    | (Voddi                              |
| Codes                                              |                                     |
| Hot Rolled Steel                                   | AISC 14th (360-10): ASD             |
| Stiffness Adjustment                               | Yes (Iterative)                     |
| Notional Annex                                     | None                                |
| Connections                                        | AISC 14th (360-10) <sup>-</sup> ASD |
| Cold Formed Steel                                  | AISI \$100-12; ASD                  |
| Stiffness Adjustment                               | Yes (Iterative)                     |
| Wood                                               | None                                |
| Temperature                                        | < 100F                              |
| Concrete                                           | None                                |
| Masonry                                            | None                                |
| Aluminum                                           | None                                |
| Structure Type                                     | Building                            |
| Stiffness Adjustment                               | Yes (Iterative)                     |
| Stainless                                          | None                                |
| Stiffness Adjustment                               | Yes (Iterative)                     |
|                                                    | , , ·····,                          |

| Concrete                                                  |                          |
|-----------------------------------------------------------|--------------------------|
| Compression Stress Block                                  | Rectangular Stress Block |
| Analyze using Cracked Sections                            | Yes                      |
| Leave room for horizontal rebar splices (2*d bar spacing) | No                       |



### Model Settings (Continued)

| List forces which were ignored for design in the Detail Report | Yes       |
|----------------------------------------------------------------|-----------|
|                                                                |           |
| Rebar                                                          |           |
| Column Min Steel                                               | 1         |
| Column Max Steel                                               | 8         |
| Rebar Material Spec                                            | ASTM A615 |
| Warn if beam-column framing arrangement is not understood      | No        |

| Shear Reinforcement                          |   |
|----------------------------------------------|---|
| Number of Shear Regions                      | 4 |
| Region 2 & 3 Spacing Increase Increment (in) | 4 |

Seismic

|--|

| Code                                                    | ASCE 7-10 |
|---------------------------------------------------------|-----------|
| Risk Category                                           | l or ll   |
| Drift Cat                                               | Other     |
| Base Elevation (ft)                                     |           |
| Include the weight of the structure in base shear calcs | Yes       |

| Site Parameters      |       |
|----------------------|-------|
| S <sub>1</sub> (g)   | 0.06  |
| $SD_1$ (g)           | 0.096 |
| SD <sub>s</sub> (g)  | 0.178 |
| T <sub>L</sub> (sec) | 6     |

### Structure Characteristics

| T Z (sec)             |      |
|-----------------------|------|
| T X (sec)             |      |
| C <sub>t</sub> X      | 0.02 |
| C <sub>t</sub> Exp. Z | 0.75 |
| C <sub>t</sub> Exp. X | 0.75 |
| RZ                    | 2    |
| RX                    | 2    |
| $\Omega_0 Z$          | 2    |
| $\Omega_0 X$          | 2    |
| C <sub>a</sub> Z      | 2    |
| C₄X                   | 2    |
| ρΖ                    | 1    |
| ρΧ                    | 1    |



### Load Combinations

|    | Description                 | Solve | P-Delta | BLC | Factor | BLC  | Factor | BLC | Factor | BLC    | Factor |
|----|-----------------------------|-------|---------|-----|--------|------|--------|-----|--------|--------|--------|
| 1  |                             | Yes   | Y       | DL  | 1      |      |        |     |        |        |        |
| 2  | IBC 16-10                   | Yes   | Y       | DL  | 1      | SL   | 1      |     |        |        |        |
| 3  | IBC 16-12 (A)               | Yes   | Y       | DL  | 1      | WL+X | 0.6    | OL3 | 0.6    |        |        |
| 4  | IBC 16-12 (B)               | Yes   | Y       | DL  | 1      | WL-X | 0.6    | OL3 | 0.6    |        |        |
| 5  | IBC 16-13 (A) (static wind) | Yes   | Y       | DL  | 1      | OL1  | 0.45   | SL  | 0.75   | OL3    | 0.45   |
| 6  | IBC 16-13 (B) (static wind) | Yes   | Y       | DL  | 1      | OL2  | 0.45   | SL  | 0.75   | OL3    | 0.45   |
| 7  | Total WL + 0.25 SL          | Yes   | Y       | DL  | 1      | WL+X | 0.45   | SL  | 0.25   |        |        |
| 8  | Total WL + 0.25 SL          | Yes   | Y       | DL  | 1      | WL-X | 0.45   | SL  | 0.25   |        |        |
| 9  | IBC 16-15 (A)               | Yes   | Y       | DL  | 0.6    | WL+X | 0.6    | OL3 | 0.6    |        |        |
| 10 | IBC 16-15 (B)               | Yes   | Y       | DL  | 0.6    | WL-X | 0.6    | OL3 | 0.6    |        |        |
| 11 | Seismic                     |       |         |     |        |      |        |     |        |        |        |
| 12 | IBC 16-12 C (A)             | Yes   | Y       | DL  | 1      | ELX  | 0.7    |     |        | Sds*DL | 0.14   |
| 13 | IBC 16-12 C (B)             | Yes   | Y       | DL  | 1      | ELX  | -0.7   |     |        | Sps*DL | 0.14   |
| 14 | IBC 16-12 (D) (A)           | Yes   | Y       | DL  | 1      | ELZ  | 0.7    |     |        | Sds*DL | 0.14   |
| 15 | IBC 16-12 (D) (B)           | Yes   | Y       | DL  | 1      | ELZ  | -0.7   |     |        | Sds*DL | 0.14   |
| 16 | IBC 16-14 (A) (A)           | Yes   | Y       | DL  | 1      | ELX  | 0.525  | SL  | 0.75   | Sds*DL | 0.105  |
| 17 | IBC 16-14 (A) (B)           | Yes   | Y       | DL  | 1      | ELX  | -0.525 | SL  | 0.75   | Sds*DL | 0.105  |
| 18 | IBC 16-14 (B) (A)           | Yes   | Y       | DL  | 1      | ELZ  | 0.525  | SL  | 0.75   | Sds*DL | 0.105  |
| 19 | IBC 16-14 (B) (B)           | Yes   | Y       | DL  | 1      | ELZ  | -0.525 | SL  | 0.75   | Sds*DL | 0.105  |
| 20 | IBC 16-16 (A) (A)           | Yes   | Y       | DL  | 0.6    | ELX  | 0.7    |     |        | Sds*DL | -0.14  |
| 21 | IBC 16-16 (A) (B)           | Yes   | Y       | DL  | 0.6    | ELX  | -0.7   |     |        | Sds*DL | -0.14  |
| 22 | IBC 16-16 (B) (A)           | Yes   | Y       | DL  | 0.6    | ELZ  | 0.7    |     |        | Sds*DL | -0.14  |
| 23 | IBC 16-16 (B) (B)           | Yes   | Y       | DL  | 0.6    | ELZ  | -0.7   |     |        | Sds*DL | -0.14  |

| Solv Inc | North Silver Brook | SK1                             |
|----------|--------------------|---------------------------------|
| JRD      |                    | Apr 13, 2023                    |
| 17010    |                    | 22_0912 - 1x53 TDP 2.0 0°- Trin |

| -2.56 psf                  |                    |                                 |
|----------------------------|--------------------|---------------------------------|
|                            |                    |                                 |
| Loads: BLC 2, Solar Panels |                    |                                 |
| Solv Inc.                  | North Silver Brook | SK-2                            |
| JRD                        |                    | Apr 13, 2023                    |
| 17010                      |                    | 22_0912 - 1x53 TDP 2.0 0°- Trin |

| -18.14 psf        |                    |                                 |
|-------------------|--------------------|---------------------------------|
|                   |                    |                                 |
| Loads: BLC 3 Show |                    |                                 |
| Solv Inc          | North Silver Brook | SK-3                            |
| JRD               |                    | Apr 13, 2023                    |
| 17010             |                    | 22_0912 - 1x53 TDP 2.0 0°- Trin |



|                           | A REAL PROPERTY AND A REAL | the second se |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Ludus. DLU J, Seisifiic Z | North Silver Presk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SK E                                                                                                            |
| JRD                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Apr 13, 2023                                                                                                    |
| 17010                     | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 22_0912 - 1x53 TDP 2.0 0°- Trin                                                                                 |



| 14.76 psf                      |                    |                                 |
|--------------------------------|--------------------|---------------------------------|
|                                |                    |                                 |
| Loads: BLC 7, Wind Downforce - | Static             |                                 |
| Solv Inc.                      | North Silver Brook | SK-7                            |
| JRD                            |                    | Apr 13, 2023                    |
| 17010                          |                    | 22_0912 - 1x53 TDP 2.0 0°- Trin |



| 27.57 psf                        | 19.16 psf          |                                                 |
|----------------------------------|--------------------|-------------------------------------------------|
|                                  |                    |                                                 |
| Loads: BLC 9, Wind Downforce - [ | Dynamic            |                                                 |
| Solv Inc.                        | North Silver Brook | SK-9                                            |
| אט<br>17010                      |                    | Apr 13, 2023<br>22_0912 - 1x53 TDP 2.0 0°- Trin |

| : Solv Inc. | : JRD    | : 17010    | : North Silver Brook |  |
|-------------|----------|------------|----------------------|--|
| Company     | Designer | Job Number | Model Name           |  |
|             |          |            | A NEMETSCHEK COMPANY |  |

I

### 4/13/2023 11:54:44 AM Checked By : JS

II

## Envelope AISC 14th (360-10): ASD Steel Code Checks Member Shape Code Check Loclin1 LC

I

| Eqn            | H3-6      | H3-6      | H1-1b            | -11-1b*     | -11-1b*            | H1-1b       | H1-1b              | -11-1b*     | -11-1b*            | -11-1b*     |        |
|----------------|-----------|-----------|------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|--------|
| ср             | 1         | 1         | 1                | 1           | 1                  | -           | 1                  | -           | 1                  | 1           | -      |
| Mnzz/om [k-in] | 139.548   | 139.548   | 298.256          | 92.729      | 92.729             | 92.729      | 92.729             | 92.729      | 92.729             | 92.729      | 92.729 |
| Mnyy/om [k-in] | 106.058   | 106.058   | 130.007          | 35.079      | 35.079             | 35.079      | 35.079             | 35.079      | 35.079             | 35.079      | 35.079 |
| Pnt/om [k]     | 84.078    | 84.078    | 132.635          | 59.947      | 59.947             | 59.947      | 59.947             | 59.947      | 59.947             | 59.947      | 59.947 |
| Pnc/om [k]     | 11.498    | 11.498    | 100.092          | 25.331      | 25.331             | 25.331      | 25.331             | 25.331      | 25.331             | 25.331      | 25.331 |
| С              | 5         | 5         | 15               | 13          | 13                 | 5           | 5                  | 12          | 12                 | 13          | 13     |
| Dir            | γ         | ٨         | z                | ٨           | γ                  | ٨           | γ                  | 7           | γ                  | ٨           | >      |
| Loc[in]        | 6.263     | 6.031     | 0                | 0           | 0                  | 99.513      | 99.513             | 0           | 0                  | 0           | 0      |
| Shear Check    | 0.756     | 0.734     | 0.007            | 0.003       | 0.003              | 0.007       | 0.007              | 0.003       | 0.003              | 0.002       | 0.002  |
| С              | 5         | 5         | 5                | 2           | 2                  | 5           | 5                  | 2           | 2                  | 2           | 2      |
| Loc[in]        | 6.263     | 6.031     | 90               | 0           | 0                  | 0           | 0                  | 0           | 0                  | 0           | 0      |
| Code Check     | 0.992     | 0.964     | 0.531            | 0.173       | 0.169              | 0.163       | 0.163              | 0.161       | 0.157              | 0.118       | 0.107  |
| Shape          | 5X4X0.134 | 5X4X0.134 | W6X15            | W6X7        | W6X7               | W6X7        | W6X7               | W6X7        | W6X7               | W6X7        | W6X7   |
| Member         | TUBE 1    | TUBE 2    | <b>RIVE POST</b> | DLER POST 2 | <b>DLER POST 7</b> | DLER POST 5 | <b>DLER POST 4</b> | DLER POST 3 | <b>DLER POST 6</b> | DLER POST 1 | M424   |
|                |           |           |                  | Ц           |                    |             | Ц                  | 브           |                    | Ц           |        |



Company : Solv Inc. Designer : JRD Job Number : 17010 Model Name : North Silver Brook

| Detail Report: TUBE 1        |             | Unity Check: 0.992 (axia                                                                                              | al/bending)                                                        | Load Combination: LC 5: IBC 16-13 (A) (static win                                  |                                            |
|------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------|
|                              |             | put Data:<br>Shape:<br>Member Type:<br>Length (in):<br>Material Type:<br>Design Rule:<br>Number of Internal Sections: | 5X4X0.134<br>Beam<br>1189.953<br>Hot Rolled Steel<br>Typical<br>20 | l Node:<br>J Node:<br>I Release:<br>J Release:<br>I Offset (in):<br>J Offset (in): | GA<br>VX1E<br>Fixed<br>Fixed<br>N/A<br>N/A |
| Material Properties:         |             |                                                                                                                       |                                                                    |                                                                                    |                                            |
| Material:                    | A500 Gr. 60 | Therm. Coeff. (1e⁵°F⁻¹):                                                                                              | 0.65                                                               | R,,:                                                                               | 1.5                                        |
| E (ksi):                     | 29000       | Density (k/ft³):                                                                                                      | 0.49                                                               | F <sub>u</sub> (ksi):                                                              | 70                                         |
| G (ksi):                     | 11154       | F <sub>v</sub> (ksi):                                                                                                 | 60                                                                 | R <sub>t</sub> :                                                                   | 1.2                                        |
| Nu:                          | 0.3         | 3                                                                                                                     |                                                                    | •                                                                                  |                                            |
| Shape Properties:            |             |                                                                                                                       |                                                                    |                                                                                    |                                            |
| d (in):                      | 5           | I <sub>vv</sub> (in⁴):                                                                                                | 6.17                                                               | Area (in²):                                                                        | 2.34                                       |
| b <sub>f</sub> (in):         | 4           | $I_{zz}^{\gamma}(in^4)$ :                                                                                             | 8.714                                                              | J (in⁴):                                                                           | 10.861                                     |
| t (in):                      | 0.134       |                                                                                                                       |                                                                    |                                                                                    |                                            |
| Design Properties:           |             |                                                                                                                       |                                                                    |                                                                                    |                                            |
| L <sub>b v-v</sub> (in):     | 284         | к <sub>у-у</sub> :                                                                                                    | 1                                                                  | Max Defl Ratio:                                                                    | L/652                                      |
| L <sub>b z-z</sub> (in):     | 284         | K <sub>z-z</sub> :                                                                                                    | 1                                                                  | Max Defl Location:                                                                 | 983.277                                    |
| L <sub>comp top</sub> (in) : | Lbyy        | y sway:                                                                                                               | No                                                                 | Span:                                                                              | I                                          |
| L <sub>comp bot</sub> (in) : | Lbyy        | z sway:                                                                                                               | No                                                                 |                                                                                    |                                            |
| L <sub>torque</sub> (in):    | N/A         | Function:                                                                                                             | Latera                                                             |                                                                                    |                                            |
| C <sub>b</sub> :             | 1           | Seismic DR:                                                                                                           | None                                                               |                                                                                    |                                            |
|                              |             | TUBE 1                                                                                                                |                                                                    |                                                                                    |                                            |
| GA                           |             |                                                                                                                       |                                                                    |                                                                                    | •<br>VX1E                                  |







| Limit State                                        | Required    | Available    | Unity Check | Result |
|----------------------------------------------------|-------------|--------------|-------------|--------|
| Applied Loading - Bending/Axial                    |             |              |             |        |
| Applied Loading - Shear + Torsion                  | -           | -            | -           | -      |
| Axial Tension Analysis                             | 0.000 k     | 84.078 k     | -           | -      |
| Axial Compression Analysis                         | 0.000 k     | 11.498 k     | -           | -      |
| Flexural Analysis (Strong Axis)                    | 39.746 k-in | 139.548 k-in | -           | -      |
| Flexural Analysis (Weak Axis)                      | 13.557 k-in | 106.058 k-in | -           | -      |
| Shear Analysis (Major Axis y)                      | 20.085 k    | 26.564 k     | 0.756       | Pass   |
| Shear Analysis (Minor Axis z)                      | 14.999 k    | 20.787 k     | 0.722       | Pass   |
| Bending & Axial Interaction Check (UC Bending Max) | -           | -            | 0.992       | Pass   |
| Torsional Analysis                                 | 78.007 k-in | 108.481 k-in | 0.719       | Pass   |



| Detail Report: VP 26                |                  | Unity Check: 0.986                                                                                                    | (axial/bending)                                                               | Load Combination: LC                                                               | 6: IBC 16-13 (B) (static wind)               |
|-------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------|
|                                     | x<br>y<br>z<br>z | put Data:<br>Shape:<br>Member Type:<br>Length (in):<br>Material Type:<br>Design Rule:<br>Number of Internal Sections: | V–HU-2.25X0.055X1.25<br>Beam<br>55.118<br>Cold Formed Steel<br>Typical<br>191 | l Node:<br>J Node:<br>I Release:<br>J Release:<br>I Offset (in):<br>J Offset (in): | V26B<br>V26C<br>Fixed<br>Fixed<br>N/A<br>N/A |
| Material Properties:                |                  |                                                                                                                       |                                                                               |                                                                                    |                                              |
| Material:                           | A653 Grade 50    | Nu:                                                                                                                   | 0.3                                                                           | F <sub>v</sub> (ksi):                                                              | 50                                           |
| E (ksi):                            | 29500            | Therm. Coeff. (1e <sup>5</sup> °F <sup>-1</sup> ):                                                                    | 0.65                                                                          | F <sub>u</sub> (ksi):                                                              | 70                                           |
| G (ksi):                            | 11346            | Density (k/ft <sup>3</sup> ):                                                                                         | 0.49                                                                          |                                                                                    |                                              |
| Shape Properties:                   |                  |                                                                                                                       |                                                                               |                                                                                    |                                              |
| D (in):                             | 2.25             | J (in⁴):                                                                                                              | 0.000432                                                                      | r <sub>y</sub> (in):                                                               | N/A                                          |
| B (in):                             | 1.25             | C <sub>w</sub> (in <sup>6</sup> ):                                                                                    | 0.21                                                                          | x <sub>0</sub> (in):                                                               | -1.446                                       |
| t (in):                             | 0.055            | r <sub>o</sub> (in):                                                                                                  | 1.875                                                                         | S <sub>e,z</sub> (in³):                                                            | N/A                                          |
| R (in):                             | 0.112            | X <sub>c</sub> (in):                                                                                                  | 1.274                                                                         | $S_{f_7}$ (in <sup>3</sup> ):                                                      | N/A                                          |
| d (in):                             | 1.25             | m (in):                                                                                                               | 0.172                                                                         | S <sub>c</sub> , (in <sup>3</sup> ):                                               | N/A                                          |
| I <sub>.vv</sub> (in⁴):             | 0.308            | j (in):                                                                                                               | 1.589                                                                         | S , (in <sup>3</sup> ):                                                            | N/A                                          |
| I <sub>77</sub> (in <sup>4</sup> ): | 0.303            | r <sub>7</sub> (in):                                                                                                  | N/A                                                                           | $S_{fy}$ (in <sup>3</sup> ):                                                       | N/A                                          |
| Area (in²):                         | 0.428            | -                                                                                                                     |                                                                               | чу<br>                                                                             |                                              |
| Design Properties:                  |                  |                                                                                                                       |                                                                               |                                                                                    |                                              |
| L <sub>b v-v</sub> (in):            | N/A              | K <sub>v-v</sub> :                                                                                                    | 1                                                                             | Max Defl Ratio:                                                                    | L/10000                                      |
| $L_{hz-z}$ (in):                    | N/A              | К <sub>2-7</sub> :                                                                                                    | 1                                                                             | Max Defl Location:                                                                 | 0                                            |
| L <sub>comp top</sub> (in):         | Lbyy             | R:                                                                                                                    | N/A                                                                           | Span:                                                                              | N/A                                          |
| L <sub>comp bot</sub> (in):         | N/A              | y sway:                                                                                                               | No                                                                            |                                                                                    |                                              |
| Ch:                                 | 1                | z sway:                                                                                                               | No                                                                            |                                                                                    |                                              |
| C                                   | N/A              | a (in):                                                                                                               | N/A                                                                           |                                                                                    |                                              |
| C <sub>m z-z</sub>                  | N/A              | . ,                                                                                                                   |                                                                               |                                                                                    |                                              |
|                                     |                  | VP                                                                                                                    | 26                                                                            |                                                                                    |                                              |
| •<br>V26B                           |                  |                                                                                                                       |                                                                               |                                                                                    | •<br>V26C                                    |
| Diagrams:                           |                  |                                                                                                                       | 0.106 at 55.118 in                                                            |                                                                                    | 0.656 at 55.118 in                           |
|                                     |                  |                                                                                                                       |                                                                               |                                                                                    |                                              |
|                                     |                  | 0.002 at 0 in                                                                                                         |                                                                               | -1 999 at 0 in                                                                     |                                              |
|                                     |                  | v Deflection                                                                                                          | n (in)                                                                        | z Deflec                                                                           | tion ( in )                                  |
| 5.539e-06 at 0 in                   |                  | 4.158e-08 at 29.88 in                                                                                                 |                                                                               | 0.223 at 29.88                                                                     | in                                           |
|                                     |                  |                                                                                                                       |                                                                               |                                                                                    |                                              |
|                                     |                  |                                                                                                                       |                                                                               |                                                                                    |                                              |
| -5.539e-06 at 29.88 in              |                  |                                                                                                                       |                                                                               |                                                                                    | 0.314 at 25.238 in                           |
| Axial Force (kips)                  | )                | y Shear Force                                                                                                         | e (kips)                                                                      | z Shear Fo                                                                         | orce (kips)                                  |





### AISI S100-12: ASD Code Check

| Max Bending Loc:<br>Equation:<br>Gov Φ Equation:<br>R (D6.1.1)<br>Max Shear Loc:<br>Max Defl Ratio:<br>Location:<br>Span: | 25.238 in<br>C3.3.1-1<br>C3.1.1<br>Not Used<br>25.238 in<br>L/10000<br>0 in<br>N/A | Cm (y-y):<br>Cm (z-z):<br>Cb:<br>KL/r (y-y):<br>KL/r (z-z):<br>L Comp Flange:<br>L Torque: | 0.85<br>0.6<br>1<br>64.983<br>55.118 in<br>55.118 in |          | Ae (Fy):<br>Ae (Fn):<br>Iy eff:<br>Sy eff (L):<br>Sy eff (R):<br>Iz eff:<br>Sz eff (T):<br>Sz eff (B): | 0.373 in <sup>2</sup><br>0.428 in <sup>2</sup><br>0.308 in <sup>4</sup><br>0.237 in <sup>3</sup><br>0.325 in <sup>3</sup><br>0.247 in <sup>4</sup><br>0.142 in <sup>3</sup><br>0.13 in <sup>3</sup> |        |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Limit State                                                                                                               |                                                                                    |                                                                                            |                                                      | Required | Available                                                                                              | Unity Check                                                                                                                                                                                         | Result |
| Axial Tension Analy                                                                                                       | rsis                                                                               |                                                                                            |                                                      | -        | 12.829 k                                                                                               | -                                                                                                                                                                                                   | -      |
| Axial Compression                                                                                                         | Analysis                                                                           |                                                                                            |                                                      | -        | 2.992 k                                                                                                | -                                                                                                                                                                                                   | -      |
| Flexural Analysis (S                                                                                                      | trong Axis)                                                                        |                                                                                            |                                                      | -        | 3.903 k-in                                                                                             | -                                                                                                                                                                                                   | -      |
| Flexural Analysis (V                                                                                                      | Veak Axis)                                                                         |                                                                                            |                                                      | -        | 7.094 k-in                                                                                             | -                                                                                                                                                                                                   | -      |
| Shear Analysis (Ma                                                                                                        | jor Axis y)                                                                        |                                                                                            |                                                      | -        | 0.945 k                                                                                                | -                                                                                                                                                                                                   | -      |
| Shear Analysis (Mir                                                                                                       | nor Axis z)                                                                        |                                                                                            |                                                      | -        | 3.952 k                                                                                                | 0.079                                                                                                                                                                                               | Pass   |
| Bending & Axial Int                                                                                                       | eraction Check (UC                                                                 | Bending Max)                                                                               |                                                      | -        | -                                                                                                      | 0.986                                                                                                                                                                                               | Pass   |



Company : Solv Inc. Designer : JRD Job Number : 17010 Model Name : North Silver Brook

D2

| Detail Report: DRIVE POST      | Unity Check: 0.531                                                                                       | (axial/bending)                                             | Load Combination: LC 5: IBC 16-13 (A) (static win                                  |                                          |
|--------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------|
| 1 <sup>×</sup> 1 <sup>×</sup>  | Input Data:                                                                                              |                                                             |                                                                                    |                                          |
|                                | Shape:<br>Member Type:<br>Length (in):<br>Material Type:<br>Design Rule:<br>Number of Internal Sections: | W6X15<br>Column<br>90<br>Hot Rolled Steel<br>Typical<br>191 | l Node:<br>J Node:<br>I Release:<br>J Release:<br>I Offset (in):<br>J Offset (in): | D1<br>D2<br>Fixed<br>Fixed<br>N/A<br>N/A |
| Material Properties:           |                                                                                                          |                                                             |                                                                                    |                                          |
| Material: A                    | 792 Therm. Coeff. ( $1e^{5} \cdot F^{-1}$ ):                                                             | 0.65                                                        | R <sub>v</sub> :                                                                   | 1.1                                      |
| <b>E (ksi)</b> : 29            | DOD Density (k/ft <sup>3</sup> ):                                                                        | 0.49                                                        | F. (ksi):                                                                          | 65                                       |
| <b>G (ksi)</b> : 11            | 54 $F_{y}$ (ksi):                                                                                        | 50                                                          | R <sub>+</sub> :                                                                   | 1.1                                      |
| Nu:                            | 0.3                                                                                                      |                                                             |                                                                                    |                                          |
| Shape Properties:              |                                                                                                          |                                                             |                                                                                    |                                          |
| d (in):                        | .99 Area (in <sup>2</sup> ):                                                                             | 4.43                                                        | S <sub>w</sub> (in⁴):                                                              | 3.34                                     |
| b <sub>f</sub> (in):           | .99 Z <sub>vv</sub> (in <sup>3</sup> ):                                                                  | 4.75                                                        | r <sub>T</sub> (in):                                                               | 1.61                                     |
| t <sub>f</sub> (in):           | .26 Z <sub>zz</sub> (in <sup>3</sup> ):                                                                  | 10.8                                                        | J (in⁴):                                                                           | 0.101                                    |
| t <sub>w</sub> (in):           | .23 C <sub>w</sub> (in <sup>6</sup> ):                                                                   | 76.5                                                        | k <sub>det</sub> (in):                                                             | 0.75                                     |
| I <sub>yy</sub> (in⁴):         | .32 W <sub>no</sub> (in <sup>2</sup> ):                                                                  | 8.58                                                        | k <sub>des</sub> (in):                                                             | 0.51                                     |
| $I_{zz}(in^4)$ :               | 9.1                                                                                                      |                                                             |                                                                                    |                                          |
| Design Properties:             |                                                                                                          |                                                             |                                                                                    |                                          |
| L <sub>b v-v</sub> (in):       | Α Κ <sub>ν-ν</sub> :                                                                                     | 1                                                           | Max Defl Ratio:                                                                    | L/103                                    |
| L <sub>b z-z</sub> (in): N/    | A K <sub>z-z</sub> :                                                                                     | 1                                                           | Max Defl Location:                                                                 | 0                                        |
| L <sub>comp top</sub> (in):    | y y sway:                                                                                                | No                                                          | Span:                                                                              | N/A                                      |
| L <sub>comp bot</sub> (in): N/ | A z sway:                                                                                                | No                                                          |                                                                                    |                                          |
| L <sub>torque</sub> (in): N/   | A Function:                                                                                              | Latera                                                      |                                                                                    |                                          |
| C <sub>b</sub> :               | 1 Seismic DR:                                                                                            | None                                                        |                                                                                    |                                          |
|                                | DI                                                                                                       | RIVE POST                                                   |                                                                                    |                                          |

D1





| 0.001 at 0 in        | 153.044 at 90 in<br>142.009 at 0 in |                              |
|----------------------|-------------------------------------|------------------------------|
|                      |                                     | -0.822 at 90 in              |
|                      |                                     | -0.882 at 0 in               |
| Torsion (kip-in)     | z-z Moment (kip-in)                 | y-y Moment (kip-in)          |
| 0.537 at 0 in        | 16.02 at 90 in                      |                              |
| 0.512 at 90          | D in 14.905 at 0 in                 |                              |
|                      |                                     | -14.905 at 0 in              |
|                      |                                     | -16.02 at 90 in              |
| Axial Stress ( ksi ) | Bending Compression Stress (ksi)    | Bending Tension Stress (ksi) |

| Limit State                                        | Required     | Available    | Unity Check | Result |
|----------------------------------------------------|--------------|--------------|-------------|--------|
| Applied Loading - Bending/Axial                    |              |              |             |        |
| Applied Loading - Shear + Torsion                  | -            | -            | -           | -      |
| Axial Tension Analysis                             | 0.000 k      | 132.635 k    | -           | -      |
| Axial Compression Analysis                         | 2.267 k      | 100.092 k    | -           | -      |
| Flexural Analysis (Strong Axis)                    | 153.044 k-in | 298.256 k-in | -           | -      |
| Flexural Analysis (Weak Axis)                      | 0.836 k-in   | 130.007 k-in | -           | -      |
| Shear Analysis (Major Axis y)                      | 0.125 k      | 27.554 k     | 0.005       | Pass   |
| Shear Analysis (Minor Axis z)                      | 0.006 k      | 55.954 k     | 0.000       | Pass   |
| Bending & Axial Interaction Check (UC Bending Max) | -            | -            | 0.531       | Pass   |



| Detail Report: IDLER POST 2       |                  | Unity Check: 0.17                                                                                                   | /3 (axial/bending)                                                 | Load Comb                                                                          | ination: LC 2: IBC 16-10                      |
|-----------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------|
| , y<br>, z                        | x<br>x<br>x<br>z | put Data:<br>Shape:<br>Member Type:<br>Length (in):<br>Material Type:<br>Design Rule:<br>Number of Internal Section | W6X7<br>Column<br>99.513<br>Hot Rolled Steel<br>Typical<br>ns: 191 | l Node:<br>J Node:<br>I Release:<br>J Release:<br>I Offset (in):<br>J Offset (in): | N597<br>N598<br>Fixed<br>Custom<br>N/A<br>N/A |
| Material Properties:              |                  |                                                                                                                     |                                                                    |                                                                                    |                                               |
| Material:                         | A992             | Therm. Coeff. (1e⁵°F⁻¹):                                                                                            | 0.65                                                               | R:                                                                                 | 1.1                                           |
| E (ksi):                          | 29000            | Density (k/ft <sup>3</sup> ):                                                                                       | 0.49                                                               | F (ksi):                                                                           | 65                                            |
| G (ksi):                          | 11154            | F., (ksi):                                                                                                          | 50                                                                 | R.:                                                                                | 1.1                                           |
| Nu:                               | 0.3              | y ¢                                                                                                                 |                                                                    | t                                                                                  |                                               |
| Shape Properties:                 |                  |                                                                                                                     |                                                                    |                                                                                    |                                               |
| d (in):                           | 5.772            | Area (in <sup>2</sup> ):                                                                                            | 2.002                                                              | S,,,(in⁴):                                                                         | 0.898                                         |
| b <sub>ℓ</sub> (in):              | 3.94             | $Z_{,nr}(in^3)$ :                                                                                                   | 1.303                                                              | $r_{\tau}(in)$ :                                                                   | 1.047                                         |
| t <sub>f</sub> (in):              | 0.165            | $Z_{77}(in^3)$ :                                                                                                    | 4.6                                                                | J (in <sup>4</sup> ):                                                              | 0.016                                         |
| t <sub>w</sub> (in):              | 0.129            | C <sub>w</sub> (in <sup>6</sup> ):                                                                                  | 13.227                                                             | k <sub>det</sub> (in):                                                             | 0.69                                          |
| $I_{\rm var}(in^4)$ :             | 1.683            | $W_{no}(in^2)$ :                                                                                                    | 5.523                                                              | k <sub>doc</sub> (in):                                                             | 0.46                                          |
| $I_{zz}^{yy}$ (in <sup>4</sup> ): | 11.955           |                                                                                                                     |                                                                    |                                                                                    |                                               |
| Design Properties:                |                  |                                                                                                                     |                                                                    |                                                                                    |                                               |
| L <sub>b v=v</sub> (in):          | N/A              | К <sub>у-у</sub> :                                                                                                  | 1                                                                  | Max Defl Ratio:                                                                    | L/10000                                       |
| $L_{h,z-z}$ (in):                 | N/A              | K <sub>z-z</sub> :                                                                                                  | 1                                                                  | Max Defl Location:                                                                 | 0                                             |
| L <sub>comp top</sub> (in):       | Lbyy             | y sway:                                                                                                             | No                                                                 | Span:                                                                              | N/A                                           |
| L <sub>comp bot</sub> (in):       | N/A              | z sway:                                                                                                             | No                                                                 |                                                                                    |                                               |
| L <sub>torque</sub> (in):         | N/A              | Function:                                                                                                           | Latera                                                             |                                                                                    |                                               |
| C <sub>b</sub> :                  | 1                | Seismic DR:                                                                                                         | None                                                               |                                                                                    |                                               |
|                                   |                  | l                                                                                                                   | DLER POST 2                                                        |                                                                                    |                                               |
| N597                              |                  |                                                                                                                     |                                                                    |                                                                                    | •<br>•                                        |
| 16201                             |                  |                                                                                                                     |                                                                    |                                                                                    | 05611                                         |
| Diagrams:                         |                  |                                                                                                                     |                                                                    |                                                                                    |                                               |
|                                   |                  |                                                                                                                     |                                                                    |                                                                                    |                                               |
|                                   |                  |                                                                                                                     |                                                                    |                                                                                    |                                               |
|                                   |                  |                                                                                                                     |                                                                    |                                                                                    |                                               |







| Limit State                                        | Required   | Available   | Unity Check | Result |
|----------------------------------------------------|------------|-------------|-------------|--------|
| Applied Loading - Bending/Axial                    |            |             |             |        |
| Applied Loading - Shear + Torsion                  | -          | -           | -           | -      |
| Axial Tension Analysis                             | 0.000 k    | 59.947 k    | -           | -      |
| Axial Compression Analysis                         | 4.394 k    | 25.331 k    | -           | -      |
| Flexural Analysis (Strong Axis)                    | 0.000 k-in | 92.729 k-in | -           | -      |
| Flexural Analysis (Weak Axis)                      | 0.000 k-in | 35.079 k-in | -           | -      |
| Shear Analysis (Major Axis y)                      | 0.000 k    | 14.892 k    | 0.000       | Pass   |
| Shear Analysis (Minor Axis z)                      | 0.000 k    | 23.357 k    | 0.000       | Pass   |
| Bending & Axial Interaction Check (UC Bending Max) | -          | -           | 0.173       | Pass   |

| z k<br>x     | HAHHHHHHHHHHH      |                                                  |
|--------------|--------------------|--------------------------------------------------|
| Solv Inc.    | North Silver Brook | SK-10                                            |
| טאט<br>17010 |                    | Apr 13, 2023<br>22_0912 - 1x53 TDP 2.0 55°- Trin |

| Loads: BLC 2, Solar Panels |                    |                                                  |
|----------------------------|--------------------|--------------------------------------------------|
| Solv Inc.                  | North Silver Brook | SK-11                                            |
| JRD<br>17010               |                    | Apr 13, 2023<br>22_0912 - 1x53 TDP 2.0 55°- Trin |

| Loads: BLC 3, Snow                 |                                                                        |
|------------------------------------|------------------------------------------------------------------------|
| JRD Apr 13, 2023                   | Loads: BLC 3, Snow                                                     |
| JRD Apr 13, 2023                   | Loads: BLC 3, Snow<br>Solv Inc. North Silver Brook SK-12               |
|                                    | Loads: BLC 3, Snow Solv Inc. IRD North Silver Brook SK-12 Apr 13, 2023 |
| JRD Apr 13, 2023                   | Loads: BLC 3, Snow<br>Solv Inc. North Silver Brook SK-12               |
|                                    | Loads: BLC 3, Snow                                                     |
| Solv Inc. North Silver Brook SK-12 | Loads: BLC 3, Snow                                                     |
|                                    | Loads: BLC 3, Snow                                                     |



| Z. K.                   | HATTING            | HHHH                             |
|-------------------------|--------------------|----------------------------------|
| Loads: BLC 5, Seismic Z |                    |                                  |
| Solv Inc.               | North Silver Brook | SK-14                            |
| JRD                     |                    | Apr 13, 2023                     |
| 17010                   |                    | 22_0912 - 1x53 TDP 2.0 55°- Trin |

| Loads: BLC 6 Wind Uplift - Static | 17 pst             |                                  |
|-----------------------------------|--------------------|----------------------------------|
| Solv Inc                          | North Silver Brook | SK-15                            |
| JRD                               |                    | Apr 13, 2023                     |
| 17010                             |                    | 22 0912 - 1x53 TDP 2.0 55°- Trin |



|           | Narth Silver Dreck | OK 17                            |
|-----------|--------------------|----------------------------------|
| Solv Inc. | North Silver Brook | SK-17<br>Apr 13, 2023            |
| 17010     |                    | Apr 13, 2023                     |
| 17010     |                    | 22 0912 - 1x53 TDP 2.0 55°- Trin |

| Loads: BLC 9, Wind Downforce - Dy | 8,19 psf         Image: Constrained of the second of the |                                  |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Solv Inc.                         | North Silver Brook                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SK-18                            |
| JRD                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Apr 13, 2023                     |
| 17010                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 22_0912 - 1x53 TDP 2.0 55°- Trin |

| : Solv Inc. | : JRD    | · : 17010  | e : North Silver Brook |  |
|-------------|----------|------------|------------------------|--|
| Company     | Designer | Job Number | Model Name             |  |
|             |          |            | A NEMETSCHEK COMPANY   |  |

I

4/13/2023 12:02:48 PM Checked By : JS

I

# Envelope AISC 14th (360-10): ASD Steel Code Checks

I

| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 59.947 35.079 92.729 1 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| LC         Shear Check         Loc[in]         Dir         LC         Pnc/om [k]         Mny/om [k-in]         Mnzz/om [k-in]           4         0.027         99.513         y         4         25.331         59.947         35.079         92.729           4         0.027         99.513         y         4         25.331         59.947         35.079         92.729           4         0.026         99.513         y         4         25.331         59.947         35.079         92.729           4         0.026         99.513         y         4         25.331         59.947         35.079         92.729           4         0.026         99.513         y         4         25.331         59.947         35.079         92.729           4         0.026         99.513         y         4         11.498         84.078         106.058         139.548           4         0.435         6.031         z         4         116.058         139.548           4         0.01         49.737         y         3         106.058         139.548           4         0.025         99.513         y         4         25.331         59.947 <td>59.947 35.079 92.729</td> | 59.947 35.079 92.729   |
| LC         Shear Check         Loc[in]         Dir         LC         Pnc/om [k]         Mnyy/om [k-in]           4         0.027         99.513         y         4         25.331         59.947         35.079           4         0.027         99.513         y         4         25.331         59.947         35.079           4         0.026         99.513         y         4         25.331         59.947         35.079           4         0.436         6.263         z         4         11.498         84.078         106.058           4         0.43         6.031         z         4         11.498         84.078         106.058           4         0.01         49.737         y         3         100.092         132.635         130.007           4         0.025         99.513         y                                                  | 59.947 35.079          |
| LC         Shear Check         Loc[in]         Dir         LC         Pnt/om [k]         Pnt/om [k]           4         0.027         99.513         y         4         25.331         59.947           4         0.027         99.513         y         4         25.331         59.947           4         0.027         99.513         y         4         25.331         59.947           4         0.026         99.513         y         4         25.331         59.947           4         0.446         6.263         z         4         11.498         84.078           4         0.43         6.031         z         4         11.498         84.078           4         0.025         99.513         y         4         25.331         59.947           4         0.026         99.513         y         4         26.331 <t< td=""><td>59.947</td></t<>                                              | 59.947                 |
| LC         Shear Check         Loc[in]         Dir         LC         Pnc/om [k]           4         0.027         99.513         y         4         25.331           4         0.027         99.513         y         4         25.331           4         0.027         99.513         y         4         25.331           4         0.026         99.513         y         4         25.331           4         0.026         99.513         y         4         25.331           4         0.026         99.513         y         4         25.331           4         0.466         6.263         z         4         11.498           4         0.43         6.031         z         4         11.498           4         0.01         49.737         y         3         100.092           4         0.025         99.513         y         4         25.331           4         0.024         99.513         y         4         25.331                                                                                                                                                                                                                                                      |                        |
| LC         Shear Check         Loc[in]         Dir         LC           4         0.027         99.513         Y         4           4         0.027         99.513         Y         4           4         0.026         99.513         Y         4           4         0.466         6.263         Z         4           4         0.011         49.737         Y         4           4         0.011         49.737         Y         4           4         0.025         99.513         Y         4           4         0.018         99.513         Y         4                                                                                                                                                                                                                                                                                                                                                                               | 25.331                 |
| LC         Shear Check         Loc[in]         Dir           4         0.027         99.513         y           4         0.027         99.513         y           4         0.026         99.513         y           4         0.466         6.263         z           4         0.43         6.031         z           4         0.01         49.737         y           4         0.015         99.513         y           4         0.025         99.513         y           4         0.018         99.513         y                                                                                                                                                                                                                                                                                                                                                                                                               | 4                      |
| LC         Shear Check         Loc[in]           4         0.027         99.513           4         0.027         99.513           4         0.026         99.513           4         0.026         99.513           4         0.026         99.513           4         0.026         99.513           4         0.026         99.513           4         0.026         99.513           4         0.026         99.513           4         0.026         99.513           4         0.026         99.513           4         0.014         49.737           4         0.018         99.513                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | >                      |
| LC Shear Check<br>4 0.027<br>4 4 0.027<br>4 4 0.026<br>4 0.026<br>4 0.026<br>4 0.026<br>4 0.013<br>4 0.018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 99.513                 |
| 1     4     4     4     4     4     4     4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.017                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4                      |
| Loc[in]<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                      |
| Code Check<br>0.458<br>0.454<br>0.442<br>0.442<br>0.442<br>0.442<br>0.442<br>0.447<br>0.417<br>0.417<br>0.417<br>0.309                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.281                  |
| Shape<br>W6X7<br>W6X7<br>W6X7<br>W6X7<br>5X4X0.134<br>5X4X0.134<br>5X4X0.134<br>M6X15<br>W6X7<br>W6X7<br>W6X7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | W6X7                   |
| Member       1     IDLER POST 4       2     IDLER POST 2       3     IDLER POST 7       4     IDLER POST 7       5     TUBE 1       7     DRIVE POST 3       9     IDLER POST 3       0     IDLER POST 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | M424                   |

| Detail Report: TUBE 1        |             | Unity Check: 0.446 (                                                                                                   | shear)                                                              | Load Combination: LC 4: IBC 16-12 (B                                               |                                            |
|------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------|
|                              | y<br>x<br>z | nput Data:<br>Shape:<br>Member Type:<br>Length (in):<br>Material Type:<br>Design Rule:<br>Number of Internal Sections: | 5X4X0.134<br>Beam<br>1189.953<br>Hot Rolled Steel<br>Typical<br>191 | l Node:<br>J Node:<br>I Release:<br>J Release:<br>I Offset (in):<br>J Offset (in): | GA<br>VX1E<br>Fixed<br>Fixed<br>N/A<br>N/A |
| Material Properties:         |             |                                                                                                                        |                                                                     |                                                                                    |                                            |
| Material:                    | A500 Gr. 60 | Therm. Coeff. (1e⁵°F⁻¹):                                                                                               | 0.65                                                                | R,,:                                                                               | 1.5                                        |
| E (ksi):                     | 29000       | Density (k/ft <sup>3</sup> ):                                                                                          | 0.49                                                                | F, (ksi):                                                                          | 70                                         |
| G (ksi):                     | 11154       | F <sub>v</sub> (ksi):                                                                                                  | 60                                                                  | R <sub>t</sub> :                                                                   | 1.2                                        |
| Nu:                          | 0.3         | ,                                                                                                                      |                                                                     |                                                                                    |                                            |
| Shape Properties:            |             |                                                                                                                        |                                                                     |                                                                                    |                                            |
| d (in):                      | 5           | I <sub>vv</sub> (in⁴):                                                                                                 | 6.17                                                                | Area (in²):                                                                        | 2.34                                       |
| b <sub>f</sub> (in):         | 4           | $I_{zz}^{y}$ (in <sup>4</sup> ):                                                                                       | 8.714                                                               | J (in <sup>4</sup> ):                                                              | 10.861                                     |
| t (in):                      | 0.134       |                                                                                                                        |                                                                     |                                                                                    |                                            |
| Design Properties:           |             |                                                                                                                        |                                                                     |                                                                                    |                                            |
| L <sub>b v-v</sub> (in):     | 284         | K <sub>v-v</sub> :                                                                                                     | 1                                                                   | Max Defl Ratio:                                                                    | L/1693                                     |
| L <sub>b z-z</sub> (in):     | 284         | K <sub>z-z</sub> :                                                                                                     | 1                                                                   | Max Defl Location:                                                                 | 983.277                                    |
| L <sub>comp top</sub> (in):  | Lbyy        | y sway:                                                                                                                | No                                                                  | Span:                                                                              | 1                                          |
| L <sub>comp bot</sub> (in) : | Lbyy        | z sway:                                                                                                                | No                                                                  |                                                                                    |                                            |
| L <sub>torque</sub> (in):    | N/A         | Function:                                                                                                              | Lateral                                                             |                                                                                    |                                            |
| C <sub>b</sub> :             | 1           | Seismic DR:                                                                                                            | None                                                                |                                                                                    |                                            |
|                              |             | TUBE 1                                                                                                                 |                                                                     |                                                                                    |                                            |



Axial Force (kips)



y Shear Force (kips)

z Shear Force (kips)



| Limit State                                        | Required    | Available    | Unity Check | Result |
|----------------------------------------------------|-------------|--------------|-------------|--------|
| Applied Loading - Bending/Axial                    |             |              |             |        |
| Applied Loading - Shear + Torsion                  | -           | -            | -           | -      |
| Axial Tension Analysis                             | 0.000 k     | 84.078 k     | -           | -      |
| Axial Compression Analysis                         | 0.000 k     | 11.498 k     | -           | -      |
| Flexural Analysis (Strong Axis)                    | 11.006 k-in | 139.548 k-in | -           | -      |
| Flexural Analysis (Weak Axis)                      | 14.778 k-in | 106.058 k-in | -           | -      |
| Shear Analysis (Major Axis y)                      | 11.838 k    | 26.564 k     | 0.446       | Pass   |
| Shear Analysis (Minor Axis z)                      | 9.269 k     | 20.787 k     | 0.446       | Pass   |
| Bending & Axial Interaction Check (UC Bending Max) | -           | -            | 0.43        | Pass   |
| Torsional Analysis                                 | 47.002 k-in | 108.481 k-in | 0.433       | Pass   |



| Detail Report: VP 3               |                     | Unity Check: 0.325 (a                                                                                                   | axial/bending)                                                                | Load Combination: LC 4: IBC 16-12 (B)                                              |                                            |  |
|-----------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------|--|
| ↓<br>↓<br>↓<br>↓<br>↓<br>↓        | N<br>> <sup>z</sup> | Input Data:<br>Shape:<br>Member Type:<br>Length (in):<br>Material Type:<br>Design Rule:<br>Number of Internal Sections: | V-HU-2.25X0.055X1.25<br>Beam<br>55.118<br>Cold Formed Steel<br>Typical<br>191 | l Node:<br>J Node:<br>I Release:<br>J Release:<br>I Offset (in):<br>J Offset (in): | V3B<br>V3C<br>Fixed<br>Fixed<br>N/A<br>N/A |  |
| Material Properties:              |                     |                                                                                                                         |                                                                               |                                                                                    |                                            |  |
| Material:                         | A653 Grade 50       | Nu:                                                                                                                     | 0.3                                                                           | F <sub>v</sub> (ksi):                                                              | 50                                         |  |
| E (ksi):                          | 29500               | Therm. Coeff. (1e⁵°F⁻¹):                                                                                                | 0.65                                                                          | F <sub>u</sub> (ksi):                                                              | 70                                         |  |
| G (ksi):                          | 11346               | Density (k/ft³):                                                                                                        | 0.49                                                                          |                                                                                    |                                            |  |
| Shape Properties:                 |                     |                                                                                                                         |                                                                               |                                                                                    |                                            |  |
| D (in):                           | 2.25                | J (in <sup>4</sup> ):                                                                                                   | 0.000432                                                                      | r <sub>v</sub> (in):                                                               | N/A                                        |  |
| B (in):                           | 1.25                | C <sub>w</sub> (in <sup>6</sup> ):                                                                                      | 0.21                                                                          | x <sub>0</sub> (in):                                                               | -1.446                                     |  |
| t(in):                            | 0.055               | r <sub>o</sub> (in):                                                                                                    | 1.875                                                                         | S <sub>97</sub> (in <sup>3</sup> ):                                                | N/A                                        |  |
| R (in):                           | 0.112               | X <sub>c</sub> (in):                                                                                                    | 1.274                                                                         | $S_{f_7}^{e,2}$ (in <sup>3</sup> ):                                                | N/A                                        |  |
| d (in):                           | 1.25                | m (in):                                                                                                                 | 0.172                                                                         | S <sub>c</sub> , (in <sup>3</sup> ):                                               | N/A                                        |  |
| I,,, (in⁴):                       | 0.308               | j (in):                                                                                                                 | 1.589                                                                         | $S_{0,1}^{(2)}$ (in <sup>3</sup> ):                                                | N/A                                        |  |
| L <sub></sub> (in <sup>4</sup> ): | 0.303               | r_ (in):                                                                                                                | N/A                                                                           | $S_{4,i}$ (in <sup>3</sup> ):                                                      | N/A                                        |  |
| Area (in <sup>2</sup> ):          | 0.428               | 2                                                                                                                       |                                                                               | (y · · ·                                                                           |                                            |  |
| Design Properties:                |                     |                                                                                                                         |                                                                               |                                                                                    |                                            |  |
| L <sub>by y</sub> (in):           | N/A                 | К,, ,:                                                                                                                  | 1                                                                             | Max Defl Ratio:                                                                    | L/10000                                    |  |
| $L_{h_{7-7}}$ (in):               | N/A                 | у-у<br>К <sub>7-7</sub> :                                                                                               | 1                                                                             | Max Defl Location:                                                                 | 0                                          |  |
| L                                 | Lbvv                | R:                                                                                                                      | N/A                                                                           | Span:                                                                              | N/A                                        |  |
| L (in) :                          | N/A                 | v swav:                                                                                                                 | No                                                                            |                                                                                    |                                            |  |
|                                   | 1                   | z sway:                                                                                                                 | No                                                                            |                                                                                    |                                            |  |
| с.                                | N/A                 | a (in):                                                                                                                 | N/A                                                                           |                                                                                    |                                            |  |
| C <sub>m z-z</sub> :              | N/A                 | - ()                                                                                                                    |                                                                               |                                                                                    |                                            |  |
|                                   |                     | VP 3                                                                                                                    | 3                                                                             |                                                                                    |                                            |  |
| V3B                               |                     |                                                                                                                         |                                                                               |                                                                                    | •<br>V3C                                   |  |
| Diagrams:                         |                     | 0.126 at 0 in                                                                                                           |                                                                               |                                                                                    | 6.351 at 55.118 in                         |  |
|                                   |                     |                                                                                                                         | -0.077 at 55.118 in                                                           | -7.046 at 0 in                                                                     |                                            |  |
|                                   |                     | y Deflection                                                                                                            | ( in )                                                                        | z Deflecti                                                                         | on (in)                                    |  |
| 0.                                | .031 at 25.238 in   | 1.287e-04 at 0 in                                                                                                       |                                                                               | 0.03 at 29.88 ir                                                                   | •<br>•                                     |  |
| -0.031 at 29 88 i                 | in                  |                                                                                                                         |                                                                               |                                                                                    | 007 at 25 220 in                           |  |
| 0.001 at 20.001                   |                     | – –1.285e–04 at 29.88 in                                                                                                |                                                                               |                                                                                    | .097 at 25.238 In                          |  |
| Axial Ford                        | ce ( kips )         | y Shear Force                                                                                                           | ( kips )                                                                      | z Shear For                                                                        | ce (kips)                                  |  |





### AISI S100-12: ASD Code Check

| Max Bending Loc:<br>Equation:<br>Gov Φ Equation:<br>R (D6.1.1)<br>Max Shear Loc:<br>Max Defl Ratio:<br>Location:<br>Span: | 25.238 in<br>C5.2.1-3<br>C3.1.1<br>Not Used<br>25.238 in<br>L/10000<br>0 in<br>N/A | Cm (y-y):<br>Cm (z-z):<br>Cb:<br>KL/r (y-y):<br>KL/r (z-z):<br>L Comp Flange:<br>L Torque: | 0.85<br>0.6<br>1<br>64.983<br>55.118 in<br>55.118 in |          | Ae (Fy):<br>Ae (Fn):<br>Iy eff:<br>Sy eff (L):<br>Sy eff (R):<br>Iz eff:<br>Sz eff (T):<br>Sz eff (B): | 0.373 in <sup>2</sup><br>0.428 in <sup>2</sup><br>0.308 in <sup>4</sup><br>0.237 in <sup>3</sup><br>0.325 in <sup>3</sup><br>0.247 in <sup>4</sup><br>0.13 in <sup>3</sup><br>0.142 in <sup>3</sup> |        |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Limit State                                                                                                               |                                                                                    |                                                                                            |                                                      | Required | Available                                                                                              | Unity Check                                                                                                                                                                                         | Result |
| Axial Tension Analy                                                                                                       | /sis                                                                               |                                                                                            |                                                      | -        | 12.829 k                                                                                               | -                                                                                                                                                                                                   | -      |
| Axial Compression                                                                                                         | Analysis                                                                           |                                                                                            |                                                      | -        | 2.992 k                                                                                                | -                                                                                                                                                                                                   | -      |
| Flexural Analysis (S                                                                                                      | strong Axis)                                                                       |                                                                                            |                                                      | -        | 3.903 k-in                                                                                             | -                                                                                                                                                                                                   | -      |
| Flexural Analysis (V                                                                                                      | Veak Axis)                                                                         |                                                                                            |                                                      | -        | 7.094 k-in                                                                                             | -                                                                                                                                                                                                   | -      |
| Shear Analysis (Ma                                                                                                        | jor Axis y)                                                                        |                                                                                            |                                                      | -        | 0.945 k                                                                                                | -                                                                                                                                                                                                   | -      |
| Shear Analysis (Mir                                                                                                       | nor Axis z)                                                                        |                                                                                            |                                                      | -        | 3.952 k                                                                                                | 0.025                                                                                                                                                                                               | Pass   |
| Bending & Axial Interaction Check (UC Bending Max)                                                                        |                                                                                    |                                                                                            | -                                                    | -        | 0.325                                                                                                  | Pass                                                                                                                                                                                                |        |



| Detail Report: DRIVE POST           |                                       | Unity Check: 0.417 (a)                                                         | xia <b>l</b> /bending)                   | Load Combination: LC 4: IBC 16-12 (B)                        |                              |
|-------------------------------------|---------------------------------------|--------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------|------------------------------|
|                                     | Input Data:<br>Shape:<br>Member Type: |                                                                                | W6X15<br>Column                          | l Node:<br>J Node:                                           | D1<br>D2                     |
| <sup>z</sup>                        | > <sup>z</sup>                        | Length (in):<br>Material Type:<br>Design Rule:<br>Number of Internal Sections: | 90<br>Hot Rolled Steel<br>Typical<br>191 | l Release:<br>J Release:<br>l Offset (in):<br>J Offset (in): | Fixed<br>Fixed<br>N/A<br>N/A |
| Material Properties:                |                                       |                                                                                |                                          |                                                              |                              |
| Material:                           | A992                                  | Therm. Coeff. (1e <sup>5</sup> °F <sup>-1</sup> ):                             | 0.65                                     | R <sub>v</sub> :                                             | 1.1                          |
| E (ksi):                            | 29000                                 | Density (k/ft³):                                                               | 0.49                                     | F <sub>u</sub> (ksi):                                        | 65                           |
| G (ksi):                            | 11154                                 | F <sub>v</sub> (ksi):                                                          | 50                                       | R <sub>t</sub> :                                             | 1.1                          |
| Nu:                                 | 0.3                                   | ,                                                                              |                                          | -                                                            |                              |
| Shape Properties:                   |                                       |                                                                                |                                          |                                                              |                              |
| d (in):                             | 5.99                                  | Area (in²):                                                                    | 4.43                                     | S <sub>w</sub> (in⁴):                                        | 3.34                         |
| b <sub>f</sub> (in):                | 5.99                                  | $Z_{yy}$ (in <sup>3</sup> ):                                                   | 4.75                                     | r <sub>τ</sub> (in):                                         | 1.61                         |
| t <sub>f</sub> (in):                | 0.26                                  | $Z_{zz}^{\gamma\gamma}$ (in <sup>3</sup> ):                                    | 10.8                                     | J (in <sup>4</sup> ):                                        | 0.101                        |
| t <sub>w</sub> (in):                | 0.23                                  | C <sub>w</sub> (in <sup>6</sup> ):                                             | 76.5                                     | k <sub>det</sub> (in):                                       | 0.75                         |
| $I_{yy}^{''}$ (in <sup>4</sup> ):   | 9.32                                  | $W_{no}(in^2)$ :                                                               | 8.58                                     | k <sub>des</sub> (in):                                       | 0.51                         |
| I <sub>zz</sub> (in <sup>4</sup> ): | 29.1                                  |                                                                                |                                          |                                                              |                              |
| Design Properties:                  |                                       |                                                                                |                                          |                                                              |                              |
| L <sub>bv-v</sub> (in):             | N/A                                   | К <sub>v-v</sub> :                                                             | 1                                        | Max Defl Ratio:                                              | L/131                        |
| $L_{b,z-z}$ (in):                   | N/A                                   | К <sub>7-7</sub> :                                                             | 1                                        | Max Defl Location:                                           | 0                            |
| L <sub>comp top</sub> (in):         | Lbyy                                  | y sway:                                                                        | No                                       | Span:                                                        | N/A                          |
| L <sub>comp bot</sub> (in):         | N/A                                   | z sway:                                                                        | No                                       |                                                              |                              |
| L <sub>torque</sub> (in):           | N/A                                   | Function:                                                                      | Latera                                   |                                                              |                              |
| C <sub>b</sub> :                    | 1                                     | Seismic DR:                                                                    | None                                     |                                                              |                              |
|                                     |                                       | DRIV                                                                           | 'E POST                                  |                                                              |                              |
| •<br>D1                             |                                       |                                                                                |                                          |                                                              | D2                           |
| Diagrams:                           |                                       |                                                                                | 0.684 at 90 in                           |                                                              |                              |
| Diagrams.                           |                                       |                                                                                |                                          |                                                              |                              |
|                                     |                                       |                                                                                |                                          |                                                              |                              |
|                                     |                                       |                                                                                |                                          |                                                              | -0.007 at 90 in              |
|                                     |                                       | y Deflection (                                                                 | ( in )                                   | z Deflection                                                 | ( in )                       |
| 1.189 at 0 in                       |                                       |                                                                                |                                          | 1.275e-04 at 0 in                                            |                              |
|                                     | 1.076 at 90 in                        |                                                                                |                                          |                                                              |                              |

Axial Force (kips)

z Shear Force (kips)





| Limit State                                        | Required     | Available    | Unity Check | Result |
|----------------------------------------------------|--------------|--------------|-------------|--------|
| Applied Loading - Bending/Axial                    |              |              |             |        |
| Applied Loading - Shear + Torsion                  | -            | -            | -           | -      |
| Axial Tension Analysis                             | 0.000 k      | 132.635 k    | -           | -      |
| Axial Compression Analysis                         | 1.189 k      | 100.092 k    | -           | -      |
| Flexural Analysis (Strong Axis)                    | 121.775 k-in | 298.256 k-in | -           | -      |
| Flexural Analysis (Weak Axis)                      | 0.372 k-in   | 130.007 k-in | -           | -      |
| Shear Analysis (Major Axis y)                      | 0.271 k      | 27.554 k     | 0.01        | Pass   |
| Shear Analysis (Minor Axis z)                      | 0.005 k      | 55.954 k     | 0.000       | Pass   |
| Bending & Axial Interaction Check (UC Bending Max) | -            | -            | 0.417       | Pass   |

| Detail Report: IDLER POST 4         |                | Unity Check: 0.458 (axia                           | l/bending)       | Load Combination: LC 4: IBC 16-12 (B) |             |  |
|-------------------------------------|----------------|----------------------------------------------------|------------------|---------------------------------------|-------------|--|
| AN AN                               | Ir             | nput Data:                                         |                  |                                       |             |  |
|                                     | X              | Shape:<br>Mombor Typo:                             | W6X7             | l Node:                               | I4A         |  |
| _                                   | -              | Length (in):                                       | 99.513           | l Release:                            | Fixed       |  |
|                                     | > <sup>∠</sup> | Material Type:                                     | Hot Rolled Steel | J Release:                            | Custom      |  |
|                                     |                | Design Rule:                                       | Typical          | l Offset (in):                        | N/A         |  |
|                                     |                | Number of Internal Sections:                       | 191              | J Offset (in):                        | N/A         |  |
| Material Properties:                |                |                                                    |                  |                                       |             |  |
| Material:                           | A992           | Therm. Coeff. (1e <sup>5</sup> °F <sup>-1</sup> ): | 0.65             | R <sub>v</sub> :                      | 1.1         |  |
| E (ksi):                            | 29000          | Density (k/ft³):                                   | 0.49             | F <sub>u</sub> (ksi):                 | 65          |  |
| G (ksi):                            | 11154          | F <sub>v</sub> (ksi):                              | 50               | R <sub>t</sub> :                      | 1.1         |  |
| Nu:                                 | 0.3            | ,                                                  |                  | -                                     |             |  |
| Shape Properties:                   |                |                                                    |                  |                                       |             |  |
| d (in):                             | 5.772          | Area (in²):                                        | 2.002            | S " (in⁴):                            | 0.898       |  |
| b <sub>f</sub> (in):                | 3.94           | $Z_{yy}$ (in <sup>3</sup> ):                       | 1.303            | $r_{\tau}$ (in):                      | 1.047       |  |
| t <sub>f</sub> (in):                | 0.165          | Z <sub>77</sub> (in <sup>3</sup> ):                | 4.6              | J (in <sup>4</sup> ):                 | 0.016       |  |
| t <sub>w</sub> (in):                | 0.129          | C <sub>w</sub> (in <sup>6</sup> ):                 | 13.227           | k <sub>det</sub> (in):                | 0.69        |  |
| $I_{vv}$ (in <sup>4</sup> ):        | 1.683          | W <sub>no</sub> (in <sup>2</sup> ):                | 5.523            | k <sub>des</sub> (in):                | 0.46        |  |
| I <sub>zz</sub> (in <sup>4</sup> ): | 11.955         |                                                    |                  |                                       |             |  |
| Design Properties:                  |                |                                                    |                  |                                       |             |  |
| L <sub>bv-v</sub> (in):             | N/A            | К <sub>v-v</sub> :                                 | 1                | Max Defl Ratio:                       | L/203       |  |
| L <sub>b z-z</sub> (in):            | N/A            | K <sub>z-z</sub> :                                 | 1                | Max Defl Location:                    | 0           |  |
| L <sub>comp top</sub> (in):         | Lbyy           | y sway:                                            | No               | Span:                                 | N/A         |  |
| L <sub>comp bot</sub> (in):         | N/A            | z sway:                                            | No               |                                       |             |  |
| L <sub>torque</sub> (in):           | N/A            | Function:                                          | Lateral          |                                       |             |  |
| C <sub>b</sub> :                    | 1              | Seismic DR:                                        | None             |                                       |             |  |
|                                     |                | IDLER F                                            | POST 4           |                                       | ۵           |  |
| •<br> 4A                            |                |                                                    |                  |                                       | ())●<br>I4B |  |
|                                     |                |                                                    |                  |                                       |             |  |





| Limit State                                        | Required    | Available   | Unity Check | Result |
|----------------------------------------------------|-------------|-------------|-------------|--------|
| Applied Loading - Bending/Axial                    |             |             |             |        |
| Applied Loading - Shear + Torsion                  | -           | -           | -           | -      |
| Axial Tension Analysis                             | 0.000 k     | 59.947 k    | -           | -      |
| Axial Compression Analysis                         | 0.972 k     | 25.331 k    | -           | -      |
| Flexural Analysis (Strong Axis)                    | 40.703 k-in | 92.729 k-in | -           | -      |
| Flexural Analysis (Weak Axis)                      | 0.000 k-in  | 35.079 k-in | -           | -      |
| Shear Analysis (Major Axis y)                      | 0.409 k     | 14.892 k    | 0.027       | Pass   |
| Shear Analysis (Minor Axis z)                      | 0.000 k     | 23.357 k    | 0.000       | Pass   |
| Bending & Axial Interaction Check (UC Bending Max) | -           | -           | 0.458       | Pass   |