



February 21, 2021

Bellah Homes  
Attn: Paul Miller

Re: 1032 SW Armie Street (Lot 93, New Longview)

Vista Structural Engineering, LLC, was asked to address the following rough-in inspection item for the house being built at 1032 SW Armie Street:

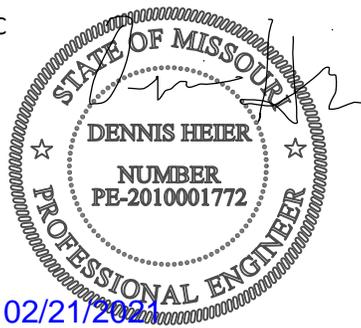
- 1) **Wire penetration less than 2" from bottom edge of double joist.** *Per the attached calculations, the joist with the hole for wire is adequate without any required repair. A picture is attached on the following page, for reference.*
- 2) **Plans call for four king studs at front window header in upper media area. One king stud and three trimmers with strapping were installed.** *Because the header is at the top of the wall, against the bottom of the double top plate, three trimmers and one king stud are acceptable at this location. We recommend approval of the current framing. A picture is included on the following page, for reference.*
- 3) **Plans call for double 2x12 header over side patio door. Framers installed double 2x10.** *Per the attached calculations, we recommend approval of the double 2x10's.*
- 4) **Framers notched exterior wall 2x4 studs to install horizontal 2x4's to straighten bowed studs. Please provide solution.** *Each of the 2x4 studs that is notched shall be strapped over the notch with Simpson CS16 strap, with the strap to extend a minimum of 13 inches above and below the notch, and fastened with (11) 8d nails into each end length above and below the notch. A picture with a sketch explaining strap installation is attached.*
- 5) **Ceiling joist near stairwell is notched. Please verify if ok, or provide solution.** *We recommend the installation of one additional ceiling joist within a maximum of 8" of the notched ceiling joist. A picture with the location of the new joist is attached.*
- 6) **Please address rafters bearing on blocking above top plate.** *We recommend nailing each of the ceiling joists to the adjacent rafter with (3) 10d nails, in addition to installing (2) Simpson SDWC15600 screws (or equivalent 6"-long framing screws) up through the top plate, into the blocking, in each bay between rafters. A picture has been attached for clarification.*

Our firm appreciates the opportunity to serve you. If you have any questions or if you need anything further, please feel free to contact us.

Sincerely,

Vista Structural Engineering, LLC

Dennis Heier, P.E.

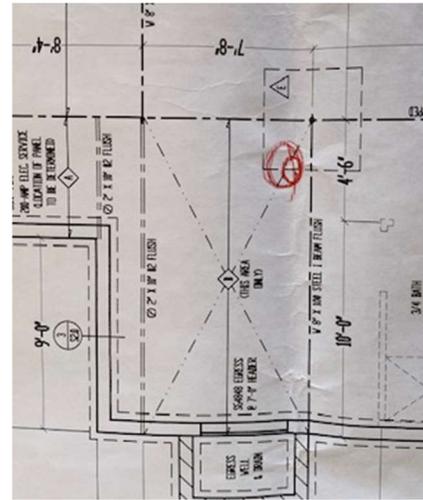


02/21/2021

# VISTA STRUCTURAL ENGINEERING, LLC

14718 NW DELIA STREET  
PORTLAND, OREGON 97229

PHONE: 971.645.0901  
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Item #1 – picture of joist and location on partial plan view

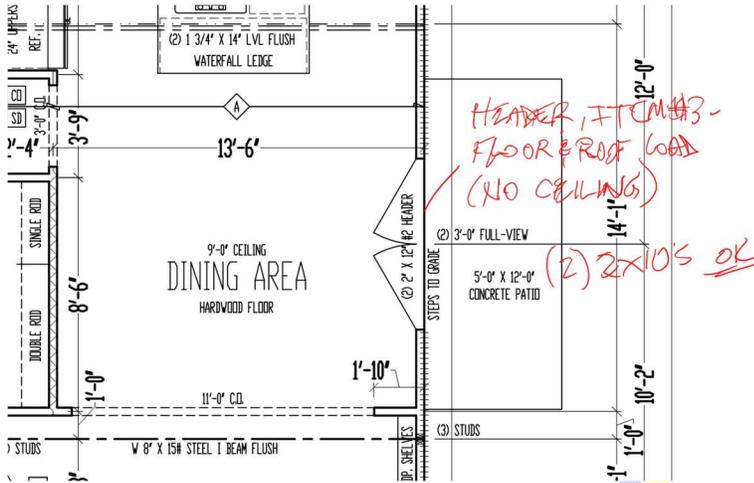


Item #2 – picture of triple trimmer and single king stud

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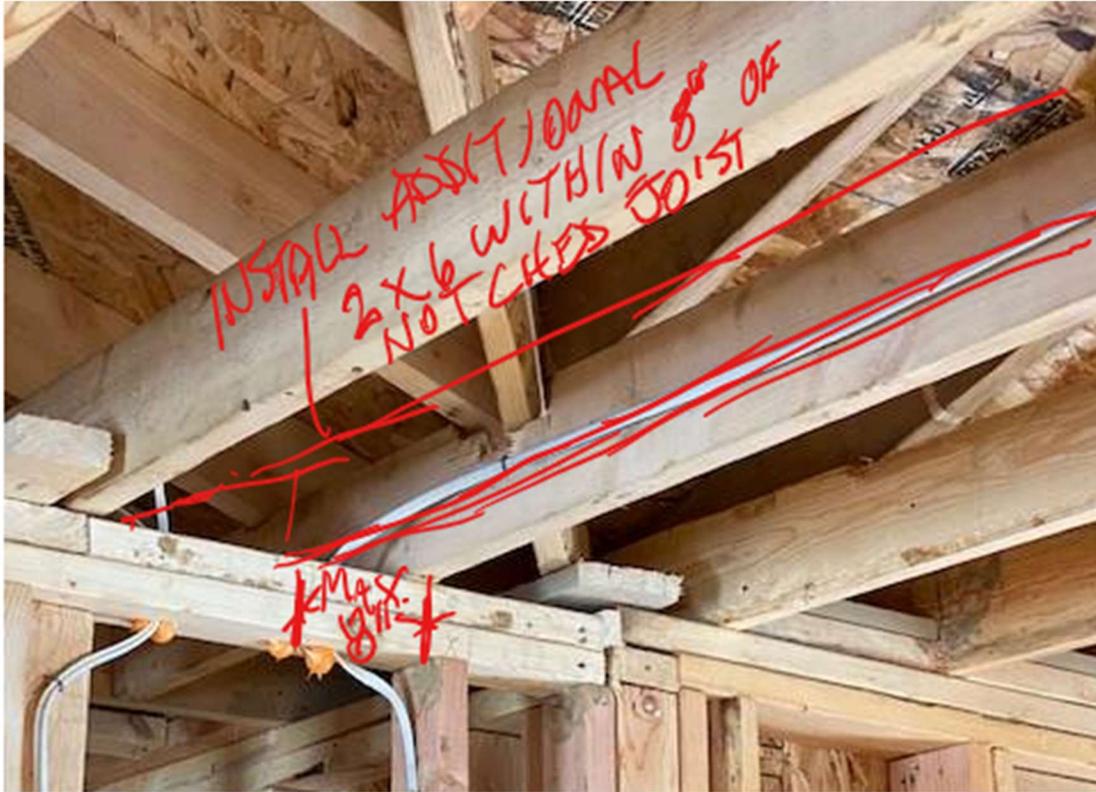


Item #3 – header above exterior door; per attached calculation, (2) 2x10's ok.



Item #4 – strap studs that were notched

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Item #5 – install additional joist within 8" of notched joist

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FASTEN EACH  
CEILING JOIST TO  
RAFTER W/ (3)  
10d NAILS

INSTALL (2)  
SIMPSON  
SDWC15600  
SCREWS UP THRU  
TOP PLATE, INTO  
BLOCKING AT  
EACH BAY

Item #6 – Fasten each ceiling joist to rafter with (3) 10d nails, and install (2) Simpson SDWC15600 (or equivalent 6"-long screws) up through wall top plate, into blocking at each bay.

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Vista Structural Engineering, LLC  
 14718 NW Delia Street  
 Portland, Oregon 97229  
 971.233.6099  
 www.vistastructural.com

Project Title:  
 Engineer:  
 Project ID:  
 Project Descr:

## General Section Property Calculator

File: NLV093 (Viewpoint).ec6  
 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.5.31  
 Vista Structural Engineering, LLC

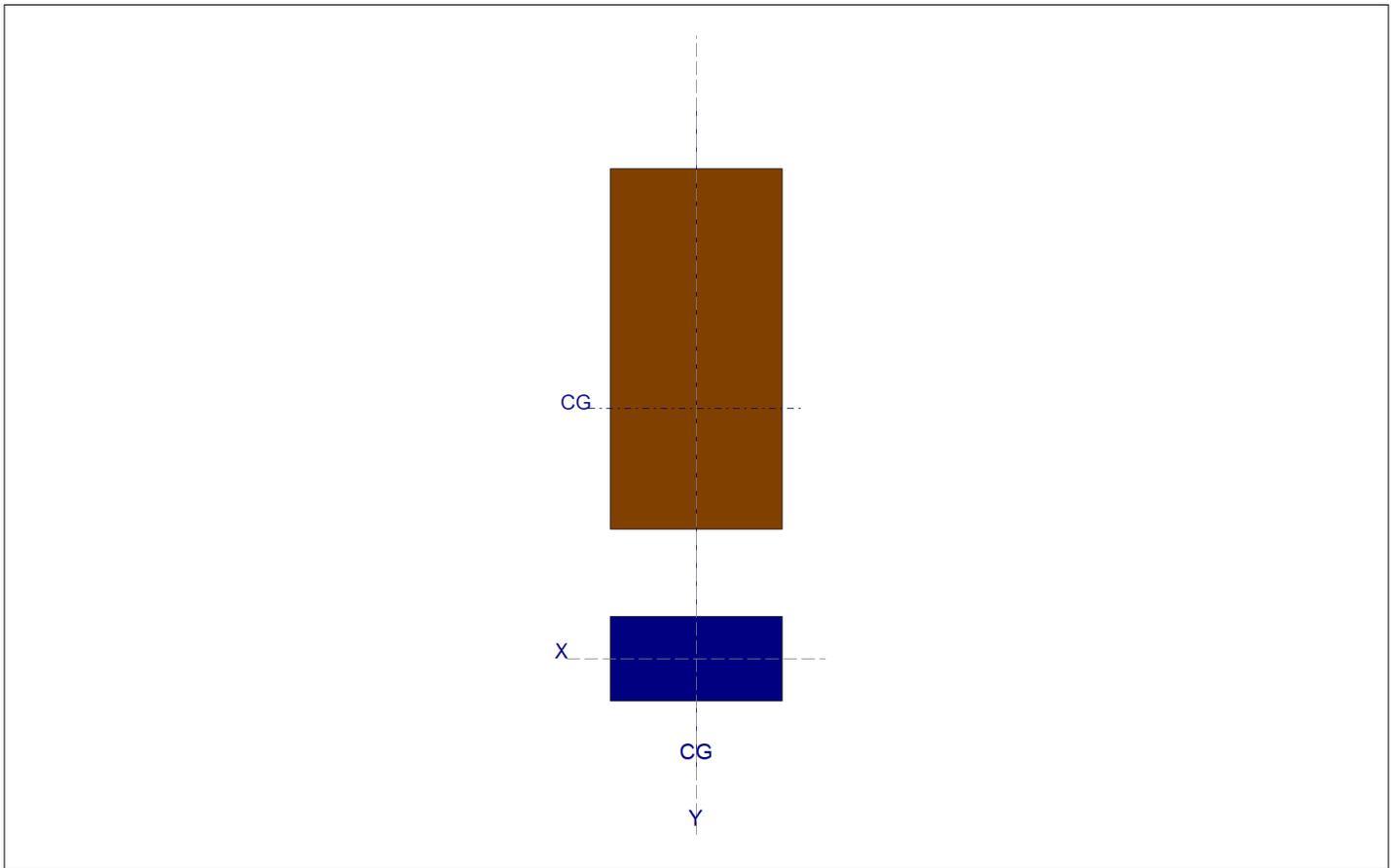
Lic. # : KW-06010523

DESCRIPTION: joist with hole 1 1/2" above bottom, 3' in from end

### Final Section Properties

|   |   |                        |     |   |                         |           |   |                        |
|---|---|------------------------|-----|---|-------------------------|-----------|---|------------------------|
| Total Area                                  | : | 23.250 in <sup>2</sup> | Ixx | : | 166.721 in <sup>4</sup> | Sxx : - Y | : | 32.789 in <sup>3</sup> |
| Calculated final C.G. distance from Datum : |   |                        | Iyy | : | 17.436 in <sup>4</sup>  | Sxx : +Y  | : | 40.026 in <sup>3</sup> |
| X cg Dist.                                  | : | 0.0 in                 | Zxx | : | 51.797 in <sup>3</sup>  | Syy : - X | : | 11.624 in <sup>3</sup> |
| Y cg Dist.                                  | : | 4.335 in               | Zyy | : | 17.438 in <sup>3</sup>  | Syy : +X  | : | 11.624 in <sup>3</sup> |
| Edge Distances from CG. :                   |   |                        |     |   |                         | r xx      | : | 2.678 in               |
| +X  | : | 1.50 in                | +Y  | : | 4.165 in                | r yy      | : | 0.8660 in              |
| -X  | : | -1.50 in               | -Y  | : | in                      |           |   |                        |

Rotation of All Components @ Angle : 0.00 deg CCW



### Rectangular & Circular Shapes

|                       |          |                       |         |          |            |           |
|-----------------------|----------|-----------------------|---------|----------|------------|-----------|
| Rectangular Shape : 1 | Height = | 1.500 in              | Width = | 3.000 in | Rotation = | 0 deg CCW |
|                       | Area =   | 4.500 in <sup>2</sup> | Xcg =   | 0.000 in | Ycg =      | 0.000 in  |



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## General Section Property Calculator

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Vista Structural Engineering, LLC

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DESCRIPTION: joist with hole 1 1/2" above bottom, 3' in from end

|                       |          |                        |         |          |            |           |
|-----------------------|----------|------------------------|---------|----------|------------|-----------|
| Rectangular Shape : 2 | Height = | 6.250 in               | Width = | 3.000 in | Rotation = | 0 deg CCW |
|                       | Area =   | 18.750 in <sup>2</sup> | Xcg =   | 0.000 in | Ycg =      | 5.375 in  |



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## Wood Beam

Lic. # : KW-06010523

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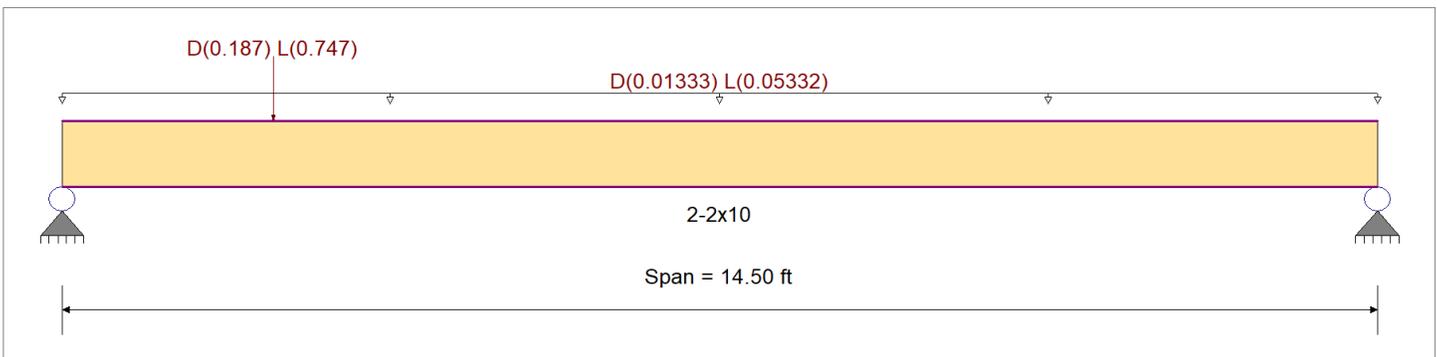
DESCRIPTION: item #1 - joist analysis

### CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10  
 Load Combination Set : IBC 2018

### Material Properties

|  |           |             |                                   |
|--|-----------|-------------|-----------------------------------|
| Analysis Method : Allowable Stress Design                              | Fb +      | 900.0 psi   | E : Modulus of Elasticity         |
| Load Combination IBC 2018  | Fb -      | 900.0 psi   | Ebend- xx                         |
| Wood Species : Douglas Fir-Larch                                       | Fc - Prll | 1,350.0 psi | Eminbend - xx                     |
| Wood Grade : No.2  | Fc - Perp | 625.0 psi   | Density                           |
| Beam Bracing : Beam is Fully Braced against lateral-torsional buckling | Fv        | 180.0 psi   | Repetitive Member Stress Increase |
|  | Ft        | 575.0 psi   |                                   |



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.010, L = 0.040 ksf, Tributary Width = 1.333 ft  
 Point Load : D = 0.1870, L = 0.7470 k @ 2.333 ft

### DESIGN SUMMARY

|                                   |   |                             |                             |
|-----------------------------------|---|-----------------------------|-----------------------------|
|                                   |   | <b>Design OK</b>            |                             |
| Maximum Bending Stress Ratio      | = | <b>0.742</b> 1              | Maximum Shear Stress Ratio  |
| Section used for this span        | = | <b>2-2x10</b>               | Section used for this span  |
|                                   | = | 844.45 psi                  |                             |
|                                   | = | 1,138.50 psi                |                             |
| Load Combination                  | = | +D+L                        | Load Combination            |
| Location of maximum on span       | = | 4.974 ft                    | Location of maximum on span |
| Span # where maximum occurs       | = | Span # 1                    | Span # where maximum occurs |
| Maximum Deflection                |   |                             |                             |
| Max Downward Transient Deflection |   | 0.291 in Ratio = 597 >= 360 |                             |
| Max Upward Transient Deflection   |   | 0.000 in Ratio = 0 < 360    |                             |
| Max Downward Total Deflection     |   | 0.364 in Ratio = 477 >= 180 |                             |
| Max Upward Total Deflection       |   | 0.000 in Ratio = 0 < 180    |                             |

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| +D+L             | 1    | 0.3640        | 6.880            |                  | 0.0000        | 0.000            |

### Vertical Reactions

| Load Combination | Support 1 | Support 2 |
|------------------|-----------|-----------|
| Overall MAXimum  | 1.267     | 0.633     |
| Overall MINimum  | 1.013     | 0.507     |
| D Only           | 0.254     | 0.127     |
| +D+L             | 1.267     | 0.633     |
| +D+0.750L        | 1.014     | 0.507     |
| +0.60D           | 0.152     | 0.076     |
| L Only           | 1.013     | 0.507     |

$S(\text{reduction}) = 32.8/42.8 = 0.77$

$S(\text{reduction}) > 0.742$

Notch OK



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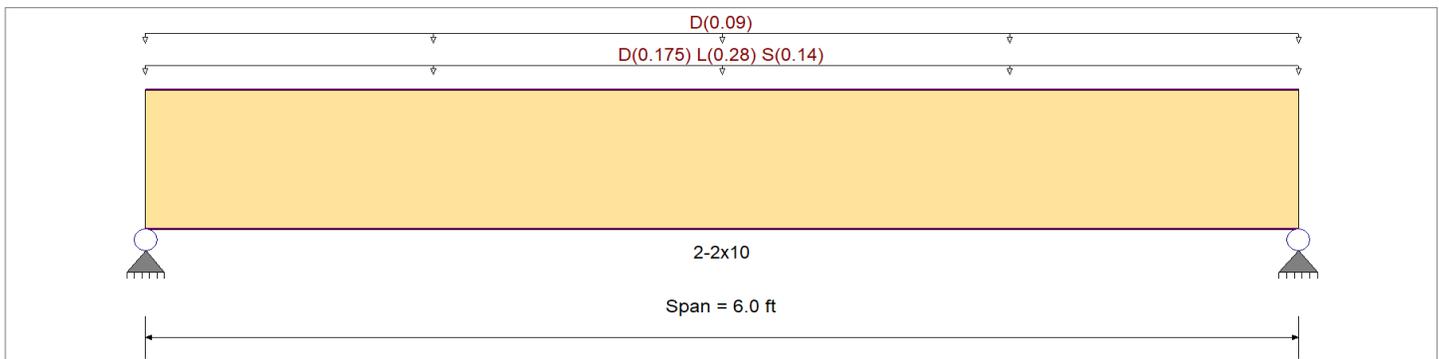
DESCRIPTION: header above exterior door at dining area

### CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10  
 Load Combination Set : IBC 2018

### Material Properties

|  |           |          |                           |           |
|--|-----------|----------|---------------------------|-----------|
| Analysis Method : Allowable Stress Design                              | Fb +      | 900 psi  | E : Modulus of Elasticity |           |
| Load Combination IBC 2018  | Fb -      | 900 psi  | Ebend- xx                 | 1600 ksi  |
|  | Fc - Prll | 1350 psi | Eminbend - xx             | 580 ksi   |
| Wood Species : Douglas Fir-Larch                                       | Fc - Perp | 625 psi  |                           |           |
| Wood Grade : No.2  | Fv        | 180 psi  |                           |           |
|  | Ft        | 575 psi  | Density                   | 31.21 pcf |
| Beam Bracing : Beam is Fully Braced against lateral-torsional buckling |           |          |                           |           |



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0250, L = 0.040, S = 0.020 ksf, Tributary Width = 7.0 ft  
 Uniform Load : D = 0.090, Tributary Width = 1.0 ft, (wall dead load)

### DESIGN SUMMARY

**Design OK**

|                                   |   |                  |                             |   |                  |
|-----------------------------------|---|------------------|-----------------------------|---|------------------|
| Maximum Bending Stress Ratio      | = | <b>0.695</b> : 1 | Maximum Shear Stress Ratio  | = | <b>0.366</b> : 1 |
| Section used for this span        | = | <b>2-2x10</b>    | Section used for this span  | = | <b>2-2x10</b>    |
|                                   | = | 687.92 psi       |                             | = | 65.80 psi        |
|                                   | = | 990.00 psi       |                             | = | 180.00 psi       |
| Load Combination                  | = | +D+L             | Load Combination            | = | +D+L             |
| Location of maximum on span       | = | 3.000ft          | Location of maximum on span | = | 0.000ft          |
| Span # where maximum occurs       | = | Span # 1         | Span # where maximum occurs | = | Span # 1         |
| <b>Maximum Deflection</b>         |   |                  |                             |   |                  |
| Max Downward Transient Deflection |   | 0.026 in         | Ratio =                     |   | 2775 >=360       |
| Max Upward Transient Deflection   |   | 0.000 in         | Ratio =                     |   | 0 <360           |
| Max Downward Total Deflection     |   | 0.054 in         | Ratio =                     |   | 1339 >=180       |
| Max Upward Total Deflection       |   | 0.000 in         | Ratio =                     |   | 0 <180           |

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| +D+0.750L+0.750S | 1    | 0.0537        | 3.022            |                  | 0.0000        | 0.000            |

### Vertical Reactions

Support notation : Far left is #1

Values in KIPS

| Load Combination | Support 1 | Support 2 |
|------------------|-----------|-----------|
| Overall MAXimum  | 1.740     | 1.740     |
| Overall MINimum  | 0.420     | 0.420     |
| D Only           | 0.795     | 0.795     |
| +D+L             | 1.635     | 1.635     |
| +D+S             | 1.215     | 1.215     |
| +D+0.750L        | 1.425     | 1.425     |
| +D+0.750L+0.750S | 1.740     | 1.740     |
| +0.60D           | 0.477     | 0.477     |
| L Only           | 0.840     | 0.840     |
| S Only           | 0.420     | 0.420     |