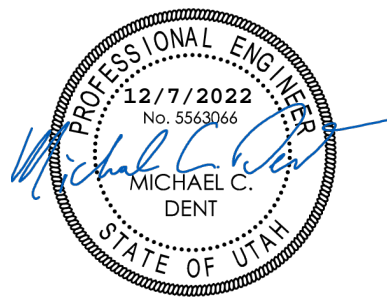




Structural Design  
(801) 876-3501



Structural Calculations

Jed Slama Bridge - Huntsville

Prepared For:

Jed Slama  
Jed Slama Construction

12/7/2022

12/7/2022

## STRUCTURAL CALCULATIONS

For: Jed Slama  
Plan #: Jed Slama Bridge - Huntsville  
Location: Huntsville Utah

From: York Engineering Inc.  
4883 Old Highway Rd. Suite A  
Morgan, Utah 84050  
(801) 876-3501

Design Criteria 2018 IBC/2015 IRC

### Roof Loads:

Roof Snow Load (psf): 40  
Roof Dead Load (psf): 15

### Floor Loads:

Floor Live Load (psf): 40  
Floor Dead Load (psf): 12  
Seismic Design Category: D  
Wind Speed: 115 mph for Exposure C

### Material Properties:

Concrete ( $f_c'$ ): 3000 psi (foundation) to 4000 psi (suspended slab)  
Concrete Reinforcement: ASTM A615 Grade 60  
Site Conditions: Dry & stable granular based, 1500 psf bearing capacity, granular based  
Backfill: KH = 35 pcf, slope not to exceed 20%  
Setback: See IRC section R403.1.7  
Dimensional Lumber: Doug Fir #2 or better  
Posts and Timbers: Doug Fir #1 or better  
Steel: ASTM Grade 50

Use straps and tie downs, and meet nailing, reinforcement and other structural requirements as noted on the drawing and within the pages of this document. These structural calculations are based on conditions and assumptions listed above. If the conditions listed herein are not met or are different, contractor shall notify York Engineering prior to construction. Prefab trusses to be engineered by the supplier. This engineering assumes that the building site is dry and stable, a high water table or adverse soils such as plastic clays, fills etc. could cause future flooding, settlement, site instability, or other adverse conditions. Verification of and liability for the soil bearing pressure, site stability, and all other site conditions, including site engineering as required, is the responsibility of others. This engineering assumes that the site is stable having no global stability concerns or hazards. If this is not true, contact soils engineer and provide soils/slope stability report to York Engineering for review and further design. These calculations and engineering are for the new building structure only and do not provide any engineering analysis of or liability/warranty for the non-structural portions of the building, or the site itself. York Engineering Inc. does not assume the role of "Registered Design Professional in Responsible Charge" on this project. The purpose of these calculations and engineering is to help reduce structural damage and loss of life due to seismic activity and/or high wind conditions. York Engineering liability is limited to five times the fee collected for services. The contractor(s) must read, understand, and accept all York Engineering documents applicable to this design prior to utilizing the design. By using the design, the owner/contractor accepts the design, assumed loads, and limits on liability stated. If any discrepancies occur between the structural and other project documents, notify York Engineering of the discrepancy prior to construction.

**The following general requirements shall be followed during construction:**

1. Attach (2) ply headers together with (3) 16d at 12" O.C. [(2) 16d OK for 2x6 headers], use (3) 16d at 12" O.C. each side of (3) ply headers [use (4) 16d when header height is greater than 11"]. Attach (4) ply headers together with (2) 1/2" through bolts at 16" O.C. or (2) SDS 1/4" x 6" screws at 16" O.C. each side of header U.N.O., see plan.
2. Contractor shall assure that all materials are used per manufactures recommendations.
3. Site engineering and liability shall be provided by the owner/builder as required.
4. Contractor shall assure that footings are properly drained, soil is dry, footings rest on undisturbed native soil, building horizontal clearance from footings to adjacent slopes is per IRC Section R403.1.7.2. If setback requirements of R403.1.7.2 cannot be met then contact engineer for further design requirements.
5. The contractor shall conform to all building codes and practices as per the current IRC
6. Provide solid blocking through structure down to footing for all load paths
7. Builder shall follow all recommendations found in all applicable geotechnical reports.
8. Stacking of two sill plates is permitted with 5/8" J-Bolts through both plates. Stacking more than two plates is not permitted without special engineering.
9. All footings, foundations, and interior slabs shall be normal wt. concrete with a compressive strength of 2,500 PSI min. U.N.O. to meet strength requirements (see calcs., no special inspections required U.N.O., see plan) however, per IRC 402.2 use 3000 PSI concrete for durability purposes.

Plan: Jed Slama Bridge - Huntsville  
 Date: 06/21/2021  
 Location: Huntsville Utah

PASS	
	W8x13 Steel
	Moment: 1.04
	DL+0.75LL+0.75S
Controlling Load Case	BRIDGE
Name	Steel
Grade	
<b>LOADING PARAMETERS</b>	
Floor Live Load (psf)	40
Floor Total Load (psf)	52
Roof Live Load (psf)	40
Roof Total Load (psf)	55
Wall Load (psf)	20
<b>BEAM SPECIFICATIONS</b>	
Beam Span (ft)	2'11" max unbraced
Beam Weight (plf)	8
	13.00
<b>BEAM SIZING</b>	
Beam Depth (in)	8
Beam Width/Weight	13
<b>UNIFORM LOADING</b>	
Floor Span (ft)	0
Roof Span (ft)	0
Wall Height (ft)	0
Total Uniform Floor Load (plf)	0
Total Live Floor Load (plf)	0
Total Uniform Roof Load (plf)	0
Total Live Roof Load (plf)	0
Total Uniform Wall Load (plf)	0
<b>PARTIALLY UNIFORM LOADING</b>	
Partially Uniform Load 1	
1 Span/Height (ft)	----
1 Start Point (ft)	0
1 End Point (ft)	0
1 Total Partially Uniform Load (plf)	0
Partially Uniform Load 2	
2 Span/Height (ft)	----
2 Start Point (ft)	0
2 End Point (ft)	0
2 Total Partially Uniform Load (plf)	0
Partially Uniform Load 3	
3 Span/Height (ft)	----
3 Start Point (ft)	0
3 End Point (ft)	0
3 Total Partially Uniform Load (plf)	0
Partially Uniform Load 4	
4 Span/Height (ft)	----
4 Start Point (ft)	0
4 End Point (ft)	0
4 Total Partially Uniform Load (plf)	0
<b>POINT LOADS</b>	
Point Load 1	
1 Location (ft)	Floor
1 Total Load (lb)	4
1 Total Load (lb)	14000
Point Load 2	
2 Location (ft)	---
2 Total Load (lb)	0
Point Load 3	
3 Location (ft)	---
3 Total Load (lb)	0
Point Load 4	
4 Location (ft)	---
4 Total Load (lb)	0
<b>REACTIONS &amp; MOMENT</b>	
Duration Increase	1.00
Left Reaction (lb)	7052
Right Reaction (lb)	7052
Max Moment (lb-ft)	27404
Max Shear (lb)	7052
C <sub>v</sub>	1.00
C <sub>t</sub>	1.00
Area (in <sup>2</sup> )	---
Moment of Inertia I (in <sup>4</sup> )	40
Maximum Bending Stress (psi)	33217
Allowable Bending Stress (psi)	47500
Allowable Moment (lb-ft)	28443
<b>MOMENT FS</b>	
Allowable Shear Stress (psi)	1.04
Maximum Shear Capacity (lb)	---
60000	
<b>SHEAR FS</b>	
Bearing Required	8.51
Elastic Modulus (psi)	---
29,000,000	
Live Load Deflection (in)	0.17
Live Load Deflection Limit	360
Allowable Live Load Deflection (in)	0.27
<b>LIVE LOAD DEFLECTION FS</b>	
Total Load Deflection (in)	1.53
Total Load Deflection Limit	0.23
240	
Allowable Total Load Deflection (in)	0.40
<b>TOTAL LOAD DEFLECTION FS</b>	
1.75	
<b>SELECTION</b>	
	Steel
	W8x13

TRUCK WEIGHT (PER COUNTY) FOR DESIGN = 78,000 LB

SIZE OF BRIDGE WILL ONLY ALLOW ONE AXLE GROUP ON BRIDGE AT A TIME THEREFORE, LOAD ON BRIDGE FOR DESIGN = 40,000 LB (APPROX.)

(4) STEEL BEAMS SPAN 8'-0" TO SUPPORT BRIDGE LOAD.  
 (2) BEAMS EACH SIDE, LOAD PER BEAM - 40,000 LB/4 = 10,000 LB PER BEAM. ONE BEAM GOOD FOR 14,000 LB (SEE CALC.) **THEREFORE, BRIDGE BEAMS OK.**