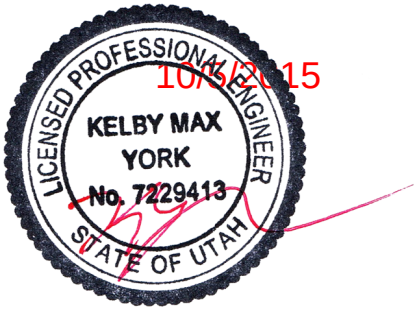
York Engineering

Structural Design
(801) 876-3501



Structural Calculations

Zollinger
6785 E. Via Cortina

Prepared For:

Creative Line L.L.C.
Custom Home Solutions

Ashlie Hull
Creative Line LLC
(801) 628-7041

10/5/2015

10/5/2015

STRUCTURAL CALCULATIONS

For: Ashlie Hull
Plan #: Zollinger
Location: 6785 E. Via Cortina

From: York Engineering Inc.
2329 West Spring Hollow Road
Morgan, Utah 84050
(801) 876-3501

Design Criteria 2012 IBC:

Roof Loads:

Roof Snow Load (psf):	45
Roof Dead Load (psf):	15

Floor Loads:

Floor Live Load (psf):	40
Floor Dead Load (psf):	10
Seismic Design Category:	D
Wind Speed:	115 mph for Exposure C 150 mph for Exposure B

Material Properties:

Concrete (f_c'):	3000 psi
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 from slopes is min. 25'
Dimensional Lumber:	Doug Fir #2 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 it shall be brought to the attention of the engineer. Prefrab roof 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. 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.

The following general requirements shall be followed during construction:

1. Contractor to verify all dimensions, spans, & conditions and notify engineer of any errors, omissions, or discrepancies prior to construction.
2. If discrepancies are found, the more stringent specification shall be followed.
3. All 2-ply and 3-ply beams and headers to be nailed using 16d two rows @ 12" O.C.
4. Contractor shall assure that all materials are used per manufactures recommendations.
5. Site engineering and liability shall be provided by the owner/builder as required.
6. 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 be a minimum of 25 feet, and that the intent of IRC Section R403.1.7.2 is met. If setback requirements of R403.1.7.2 cannot be met then contact engineer for further design requirements.
7. The contractor shall conform to all building codes and practices as per the 2012 IRC
8. Use balloon framing method when connecting floors in split level designs.
9. Provide solid blocking through structure down to footing for all load paths
10. Builder shall follow all recommendations found in all applicable geotechnical reports.
11. Stacking of two sill plates is permitted with 5/8" J-Bolts through both plates. Stacking more than
12. two plates is not permitted without special engineering.
13. Minimum strength requires 2,500 PSI concrete; however, as per IRC 402.2 3,000 PSI conrete shall
14. be used. Use 4,000 PSI concrete for suspended slabs with live loads over 40lb/ft^2. 4,000 PSI
15. concrete recommened for all exterior flatwork
16. All exterior walls shall be sheathed with 7/16" APA rated structural wood panel.
17. Block all horizontal edges 1 1/2" nominal or wider.
18. Sheathing shall extend continuous from floor to top plate and be nailed at least 4" O.C. along sill plate. Nails shall be placed not less than 1/2" from edge of panel and driven flush but shall not fracture the surface of the sheathing. Extend sheathing over gable end to wall joints and over rim joist between floors and nail to rim and wall plates at 6" O.C.

Plan: Zollinger
Date: 22 Sep 2015
Location: 6785 E. Via Cortina

Uplift Calculations

Location	**Master Bath**	**Entry**	**Laundry**	**Mudroom**	**3rd car**	**Main Gar**	**Garage**	**Great Room**	**Master**	**Garage**	**Kitchen**	**A**
	Front side	Front side	Front side	Front side	Front side	Front side	Back side	Back side	Back side	Left side	Left side	Right side
Floor	1	1	1	1	1	1	1	1	1	1	1	1
Seismic (lb)	319	125	152	155	125	229	271	222	146	358	313	1074
Wind (lb)	1433	561	684	696	561	1029	1216	997	655	3985	3487	11956
Wall Length (ft)	35	12	13	14	16	22	26	22	16	32	14	48
Wall Height (ft)	9	9	9	9	9	9	9	9	9	9	9	9
Floor Span (ft)	16	16	16	16	16	16	33	33	33	4	4	4
Roof Span (ft)	35	35	35	35	35	35	35	35	35	4	4	4
Wall Load (plf)	180	180	180	180	180	180	180	180	180	180	180	180
Total DL (plf)	314	314	314	314	314	314	365	365	365	138	138	138
Seis.Uplift (lbs)	**0**	**0**	**0**	**0**	**-**	**-**	**0**	**0**	**0**	**0**	**0**	**0**
Wind Uplift (lbs)	**0**	**0**	**0**	**0**	**-**	**-**	**0**	**0**	**0**	**0**	**1276**	**0**

Plan: Zollinger
Date: 22 Sep 2015
Location: 6785 E. Via Cortina

LEFT AND RIGHT

Wind Loading Calculations using Main Windforce-Resisting System (MWFRS)
Longitudinal Direction
Table 27.5-1 Steps to Determine MWFRS Loads Enclosed Simple Diaphram Buildings

Risk Category	**II**	Table 1.5-1
Wind speed	**115**	Figure 26.5-1 A-B or C
Exposure Category	**C**	Section 26.7
L/B upper floor	0.50	
L/B main floor	0.50	
Roof Height	8.17	
Mean roof Height	25.1	
Truss Span	**28**	
Roof Slope	7 /12	
Roof Angle (deg)	30.26	Sine = 0.5039
Lower Truss Span	**37**	
Lower roof Slope	**7** /12	
Lower roof Angle (deg)	30.26	Sine = 0.5039
Load combination factor	0.6	(ASCE 7-10 2.4.1)
Upper floor, p_h	28.4	Table 27.6-1
Upper floor, p_o	28.3	Table 27.6-1
Main floor, p_h	28.3	
Main floor, p_o	28.2	
Basement floor, p_h	28.2	
Basement floor, p_o	27.6	

				Relative positioning	
Upper Floor (psf)					
Net Pressure	17.0	Windward	10.5	Left	9.2
		Leeward	6.5	Right	9.2
Main Floor (psf)					
Net Pressure	16.9	Windward	10.5	Left	9.2
		Leeward	6.4	Right	9.2
Basement Floor (psf)					
Net Pressure	16.7	Windward	10.3	Left	9.1
		Leeward	6.4	Right	9.1

Roof (psf)	Zone 1	Zone 2	Exposure Adj. Factor	1.000
Load Case 1	-7.7	-11.2		
Load Case 2	7.5	-5.4		

Lower Roof (psf)		
Load Case 1	-7.0	-10.2
Load Case 2	6.9	-4.9

Roof Load

Roof Height	Length	Area (ft^2)	Horizontal Force (lbs)
8.17	102.00	833.0	10761

Lower Roof Load

Low Roof Height	Upper Length	Lower length	Low Roof Length(ft)	Area (ft^2)	Horizontal Force (lbs)
10.8	102	112	10	107.9	1270.0

Wall Load	**Basement**	(height) 1	**1st floor**	(height) 10	**2nd floor**	(height) 10
	ft^2	force (lbs)	ft^2	force (lbs)	ft^2	force (lbs)
Windward	112	1154.5	1120	11747.0	1020	10741.3
Leeward	112	719.4	1120	7223.2	1020	6604.7

2nd Floor Diaphragm Shear

Total Shear (lbs)	19434
Right Wall Length	See Shear Page
Left Wall Length	See Shear Page

1st Floor Diaphragm Shear

Total Shear (lbs)	38862
Right Wall Length	See Shear Page
Left Wall Length	See Shear Page

Basement Diaphragm Shear

Total Shear (lbs)	49285
Right Wall Length	See Shear Page
Left Wall Length	See Shear Page

Base Wind Shear 50222

Hurricane Ties

		Factors of Safety	
Uplift	(lbs)	H1	H2.5
Roof (per truss)	13.2	**44.29**	**45.42**
Low roof (per truss)	-15.2	**-26.39**	**-35.30**
Lateral	(lbs)	H1	H2.5
Roof (per truss)	6.0	**130.14**	**67.97**
Low roof (per truss)	0.3	**2462.57**	**1286.18**

Plan: Zollinger
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FRONT AND BAC

Wind Loading Calculations using Main Windforce-Resisting System (MWFRS)
Transverse Direction
Table 27.5-1 Steps to Determine MWFRS Loads Enclosed Simple Diaphram Buildings

Risk Category	**II**	Table 1.5-1
Wind speed	**115**	Figure 26.5-1 A-B or C
Exposure Category	**C**	Section 26.7
L/B upper floor	2.00	
L/B main floor	2.00	
Roof Height	8.17	
Mean roof Height	25.1	
Truss Span	**28**	
Roof Slope	7 /12	
Roof Angle (deg)	30.26	Sine = 0.5039
Lower Truss Span	**37**	
Lower roof Slope	**7** /12	
Lower roof Angle (deg)	30.26	Sine = 0.5039
Load combination factor	0.6	(ASCE 7-10 2.4.1)
Upper floor, p_h	24.5	Table 27.6-1
Upper floor, p_o	24.4	Table 27.6-1
Main floor, p_h	24.4	
Main floor, p_o	24.2	
Basement floor, p_h	24.2	
Basement floor, p_o	23.8	

Upper Floor (psf)				Relative positioning	
Net Pressure	14.7	Windward	10.7	Left	9.4
		Leeward	4.0	Right	9.4
Main Floor (psf)					
Net Pressure	14.6	Windward	10.6	Left	9.4
		Leeward	3.9	Right	9.4
Basement Floor (psf)					
Net Pressure	14.4	Windward	10.5	Left	9.3
		Leeward	3.9	Right	9.3

Roof (psf)	Zone 1	Zone 2	Exposure Adj. Factor	1.000
Load Case 1	-7.7	-11.2		
Load Case 2	7.5	-5.4		

Lower Roof (psf)		
Load Case 1	-7.0	-10.2
Load Case 2	6.9	-4.9

Roof Load

Roof Height	Length	Area (ft^2)	Horizontal Force (lbs)
8.17	44.00	359.3333333	4642

Lower Roof Load

Lower Roof Height	Upper Length	Lower length	Low Roof Length(ft)	Area (ft^2)	Horizontal Force (lbs)
10.8	44	51	7	75.541667	889.0

Wall Load	**Basement**	(height) 1	**1st floor**	(height) 10	**2nd floor**	(height) 10
	ft^2	force (lbs)	ft^2	force (lbs)	ft^2	force (lbs)
Windward	51	534.6	510	5420.2	440	4705.5
Leeward	51	200.1	510	2013.3	440	1747.8

2nd Floor Diaphragm Shear

Total Shear (lbs)	7869
Front Wall Length	See Shear Page
Back Wall Length	See Shear Page

1st Floor Diaphragm Shear

Total Shear (lbs)	15701
Front Wall Length	See Shear Page
Back Wall Length	See Shear Page

Basement Diaphragm Shear

Total Shear (lbs)	19785
Front Wall Length	See Shear Page
Back Wall Length	See Shear Page

Base Wind Shear 20153

Hurricane Ties

		Factors of Safety	
Uplift	(lbs)	H1	H2.5
Roof (per truss)	13.2	**44.29**	**45.42**
Low roof (per truss)	-15.2	**-26.39**	**-35.30**
Lateral	(lbs)	H1	H2.5
Roof (per truss)	105.5	**7.44**	**3.89**
Low roof (per truss)	17.4	**45.03**	**23.52**

Plan: Zollinger
Date: 22 Sep 2015
Location: 6785 E. Via Cortina

	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	Sawn (2) 2X10's	LVL (2) 9 1/2"	LVL (2) 11 7/8"	LVL (2) 7 1/4"	Steel W10x26	LVL (2) 11 7/8"	Steel W10x26	LVL (2) 11 7/8"	LVL (1) 11 7/8"
	Moment: 1.72	Shear: 2.59	Moment: 1.78	Shear: 2.13	LL Deflection: L/592	Moment: 2.96	LL Deflection: L/743	Moment: 2.66	Shear: 4.15
Name	FB-32	FB-33	FB-34	FB-35	FB-36	FB-38	FB-37	FB-39	FB-40
Grade	Sawn	LVL	LVL	LVL	Steel	LVL	Steel	LVL	LVL
LOADING PARAMETERS									
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	50	50	50	50	50	50	50	50	50
Roof Live Load (psf)	45	45	45	45	45	45	45	45	45
Roof Total Load (psf)	60	60	60	60	60	60	60	60	60
Wall Load (psf)	20	20	20	20	20	20	20	20	20
BEAM SPECIFICATIONS									
Beam Span (ft)	**5**	**2.5**	**11**	**5**	**21.5**	**10**	**15.5**	**10**	**5**
Beam Weight (plf)	5.55	9.64	12.06	7.36	26.00	12.06	26.00	12.06	6.03
BEAM SIZING									
Beam Depth (in)	**9.25**	**9.5**	**11.88**	**7.25**	**10**	**11.88**	**10**	**11.88**	**11.88**
Beam Width/Weight	**3**	**3.5**	**3.5**	**3.5**	**26**	**3.5**	**26**	**3.5**	**1.75**
UNIFORM LOADING									
Floor Span (ft)	2	32	2	36	0	2	10	21	15
Roof Span (ft)	8	26	8	0	0	2	0	0	0
Wall Height (ft)	18	18	18	0	0	18	0	0	0
Total Uniform Floor Load (plf)	50	800	50	900	0	50	250	525	375
Total Uniform Roof Load (plf)	240	780	240	0	0	60	0	0	0
Total Uniform Wall Load (plf)	360	360	360	0	0	360	0	0	0
PARTIALLY UNIFORM LOADING									
Partially Uniform Load 1	Roof	-----	-----	Floor	Roof	-----	Floor	-----	-----
1 Span/Height (ft)	0	0	0	0	0	0	22	0	0
1 Start Point (ft)	0	0	0	0	0	0	8.5	0	0
1 End Point (ft)	0	0	0	0	0	0	15.5	0	0
1 Totally Partially Uniform Load (plf)	0	0	0	0	0	0	550	0	0
Partially Uniform Load 2	Roof	-----	-----	-----	-----	-----	-----	-----	-----
2 Span/Height (ft)	0	0	0	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0
Partially Uniform Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Span/Height (ft)	0	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0
POINT LOADS									
Point Load 1	Roof	-----	-----	-----	-----	-----	-----	-----	-----
1 Location (ft)	0	0	0	0	0	0	8.5	0	0
1 Total Load (lb)	0	0	0	0	0	0	2430	0	0
Point Load 2	Roof	-----	-----	-----	-----	-----	-----	-----	-----
2 Location (ft)	0	0	0	0	0	0	12	0	0
2 Total Load (lb)	0	0	0	0	0	0	1925	0	0
Point Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Location (ft)	0	0	0	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0	0	0	0
TAPERED LOADS									
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	21.5	0	8.5	0	0
Tapered Load at Start (plf)	0	0	0	0	50	0	300	0	0
Tapered Load at End (plf)	0	0	0	0	500	0	50	0	0
REACTIONS & MOMENT									
Duration Increase	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	1639	2437	3641	2268	2430	2410	5717	2685	953
Right Reaction (lb)	1639	2437	3641	2268	4042	2410	8253	2685	953
Max Moment (lb-ft)	2049	1521	10014	2835	29796	6026	35873	6713	1191
Max Shear (lb)	1639	2437	3641	2268	4042	2410	8253	2685	953
C_v	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C_r	1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Area (in^2)	27.75	33.25	41.58	25.38	---	41.58	---	41.58	20.79
Moment of Inertia I (in^4)	198	250	489	111	144	489	144	489	245
Maximum Bending Stress (lb-ft)	575	347	1460	1110	12415	878	14947	979	347
Allowable Bending Stress (lb-ft)	990	2684	2604	2784	130417	2604	130417	2604	2604
Allowable Moment (lb-ft)	3529	11775	17862	7115	78094	17862	78094	17862	8931
MOMENT FS	**1.72**	**7.74**	**1.78**	**2.51**	**2.62**	**2.96**	**2.18**	**2.66**	**7.50**
Allowable Shear Stress (psi)	198	285	285	285	---	285	---	285	285
Maximum Shear Capacity (lb)	3663	6318	7900	4821	75000	7900	75000	7900	3950
SHEAR FS	**2.24**	**2.59**	**2.17**	**2.13**	**18.56**	**3.28**	**9.09**	**2.94**	**4.15**
Bearing Required	1.35	0.93	1.39	0.86	---	0.92	---	1.02	0.73
Elastic Modulus (psi)	1,600,000	2,000,000	2,000,000	2,000,000	29,000,000	2,000,000	29,000,000	2,000,000	2,000,000
Live Load Deflection (in)	0.01	0.00	0.07	0.05	0.44	0.02	0.25	0.10	0.01
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.17	0.08	0.37	0.17	0.72	0.33	0.52	0.33	0.17
LIVE LOAD DEFLECTION FS	**16.89**	**38.40**	**4.90**	**3.62**	**1.64**	**16.88**	**2.06**	**3.42**	**19.13**
Total Load Deflection (in)	0.03	0.00	0.23	0.06	0.61	0.11	0.33	0.12	0.01
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.25	0.13	0.55	0.25	1.08	0.50	0.78	0.50	0.25
TOTAL LOAD DEFLECTION FS	**8.50**	**36.19**	**2.44**	**4.31**	**1.76**	**4.46**	**2.34**	**4.01**	**22.59**

Plan: Zollinger
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	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	Sawn (2) 2X8's	LVL (2) 7 1/4"	LVL (3) 11 7/8"	LVL (2) 9 1/2"	Sawn (2) 2X8's	LVL (3) 11 7/8"	LVL (3) 11 7/8"	LVL (3) 11 7/8"	LVL (2) 9 1/2"	LVL (2) 9 1/2"
	Shear: 4.22	Shear: 1.04	Shear: 1.2	Moment: 2.16	Moment: 2.13	Shear: 1.2	Shear: 1.64	Shear: 1.75	Shear: 2.14	Shear: 1.33
Name	FB-23	FB-24	FB-23	FB-25	FB-26	FB-27	FB-28	FB-29	FB-30	FB-31
Grade	Sawn	LVL	LVL	LVL	Sawn	LVL	LVL	LVL	LVL	LVL
LOADING PARAMETERS										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	50	50	50	50	50	50	50	50	50	50
Roof Live Load (psf)	45	45	45	45	45	45	45	45	45	45
Roof Total Load (psf)	60	60	60	60	60	60	60	60	60	60
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
BEAM SPECIFICATIONS										
Beam Span (ft)	**3**	**4**	**9**	**9**	**4**	**9**	**6**	**9**	**6**	**5**
Beam Weight (plf)	4.35	7.36	18.09	9.64	4.35	18.09	18.09	18.09	9.64	9.64
BEAM SIZING										
Beam Depth (in)	**7.25**	**7.25**	**11.88**	**9.5**	**7.25**	**11.88**	**11.88**	**11.88**	**9.5**	**9.5**
Beam Width/Weight	**3**	**3.5**	**5.25**	**3.5**	**3**	**5.25**	**5.25**	**5.25**	**3.5**	**3.5**
UNIFORM LOADING										
Floor Span (ft)	2	28	22	2	22	32	38	33	15	30
Roof Span (ft)	8	42	42	4	0	34	36	10	8	26
Wall Height (ft)	10	18	18	18	0	18	18	18	18	18
Total Uniform Floor Load (plf)	50	700	550	50	550	800	950	825	375	750
Total Uniform Roof Load (plf)	240	1260	1260	120	0	1020	1080	300	240	780
Total Uniform Wall Load (plf)	200	360	360	360	0	360	360	360	360	360
PARTIALLY UNIFORM LOADING										
Partially Uniform Load 1	Roof	-----	-----	Floor	Roof	-----	-----	-----	-----	-----
1 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
1 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
1 End Point (ft)	0	0	0	0	0	0	0	0	0	0
1 Totally Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 2	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
POINT LOADS										
Point Load 1	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
1 Location (ft)	0	0	0	0	0	0	0	0	0	0
1 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 2	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Location (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Location (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
TAPERED LOADS										
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	0	0	0	0	0	0
Tapered Load at End (plf)	0	0	0	0	240	0	0	0	0	0
REACTIONS & MOMENT										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	742	4655	9846	2428	1109	9891	7224	6764	2954	4749
Right Reaction (lb)	742	4655	9846	2428	1109	9891	7224	6764	2954	4749
Max Moment (lb-ft)	556	4655	22154	5464	1109	22256	10836	15219	4431	5936
Max Shear (lb)	742	4655	9846	2428	1109	9891	7224	6764	2954	4749
C_v	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C_r	1.20	1.00	1.00	1.00	1.20	1.00	1.00	1.00	1.00	1.00
Area (in^2)	21.75	25.38	62.37	33.25	21.75	62.37	62.37	62.37	33.25	33.25
Moment of Inertia I (in^4)	95	111	734	250	95	734	734	734	250	250
Maximum Bending Stress (lb-ft)	254	1822	2153	1245	506	2163	1053	1479	1010	1353
Allowable Bending Stress (lb-ft)	1080	2784	2604	2684	1080	2604	2604	2604	2684	2684
Allowable Moment (lb-ft)	2365	7115	26793	11775	2365	26793	26793	26793	11775	11775
MOMENT FS	**4.25**	**1.53**	**1.21**	**2.16**	**2.13**	**1.20**	**2.47**	**1.76**	**2.66**	**1.98**
Allowable Shear Stress (psi)	216	285	285	285	216	285	285	285	285	285
Maximum Shear Capacity (lb)	3132	4821	11850	6318	3132	11850	11850	11850	6318	6318
SHEAR FS	**4.22**	**1.04**	**1.20**	**2.60**	**2.82**	**1.20**	**1.64**	**1.75**	**2.14**	**1.33**
Bearing Required	0.61	1.77	2.50	0.93	0.91	2.51	1.83	1.72	1.13	1.81
Elastic Modulus (psi)	1,600,000	2,000,000	2,000,000	2,000,000	1,600,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Live Load Deflection (in)	0.00	0.04	0.14	0.04	0.02	0.14	0.03	0.09	0.03	0.03
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.10	0.13	0.30	0.30	0.13	0.30	0.20	0.30	0.20	0.17
LIVE LOAD DEFLECTION FS	**37.64**	**3.39**	**2.13**	**7.74**	**7.94**	**2.10**	**6.35**	**3.34**	**7.08**	**4.95**
Total Load Deflection (in)	0.01	0.06	0.22	0.16	0.02	0.22	0.05	0.15	0.06	0.05
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.15	0.20	0.45	0.45	0.20	0.45	0.30	0.45	0.30	0.25
TOTAL LOAD DEFLECTION FS	**25.13**	**3.28**	**2.02**	**2.80**	**9.45**	**2.01**	**6.21**	**2.95**	**5.17**	**4.63**

Plan: Zollinger
Date: 22 Sep 2015
Location: 6785 E. Via Cortina

	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	Sawn (2) 2X8's	LVL (1) 11 7/8"	LVL (1) 11 7/8"	LVL (2) 9 1/2"	GLB 5 1/8" x 13.5"	GLB 5 1/8" x 13.5"	Sawn (2) 2X12's	Sawn (2) 2X12's	Sawn (2) 2X12's	GLB 3 1/8" x 12"
	Shear: 4.22	Shear: 2.76	Shear: 2.77	Shear: 1.79	Moment: 2.72	Moment: 3.46	Moment: 2.2	Moment: 1.79	Moment: 77.87	Moment: 2.16
Name	FB-13	FB-14	FB-15	FB-16	FB-17	FB-18	FB-19	FB-20	FB-21	FB-22
Grade	Sawn	LVL	LVL	LVL	GLB	GLB	Sawn	Sawn	Sawn	GLB
LOADING PARAMETERS										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	50	50	50	50	50	50	50	50	50	50
Roof Live Load (psf)	45	45	45	45	45	45	45	45	45	45
Roof Total Load (psf)	60	60	60	60	60	60	60	60	60	60
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
BEAM SPECIFICATIONS										
Beam Span (ft)	**3**	**4**	**6**	**6**	**14**	**14**	**7.5**	**7**	**8.5**	**11**
Beam Weight (plf)	4.35	6.03	6.03	9.64	16.80	16.80	6.75	6.75	6.75	9.12
BEAM SIZING										
Beam Depth (in)	**7.25**	**11.88**	**11.88**	**9.5**	**13.5**	**13.5**	**11.25**	**11.25**	**11.25**	**12**
Beam Width/Weight	**3**	**1.75**	**1.75**	**3.5**	**5.125**	**5.125**	**3**	**3**	**3**	**3.13**
UNIFORM LOADING										
Floor Span (ft)	2	2	2	9	18	14	12	17	0	18
Roof Span (ft)	8	16	8	10	0	0	0	0	0	0
Wall Height (ft)	10	9	9	9	0	0	0	0	0	0
Total Uniform Floor Load (plf)	50	50	50	225	450	350	300	425	0	450
Total Uniform Roof Load (plf)	240	480	240	300	0	0	0	0	0	0
Total Uniform Wall Load (plf)	200	180	180	180	0	0	0	0	0	0
PARTIALLY UNIFORM LOADING										
Partially Uniform Load 1	Roof	-----	-----	Floor	Roof	-----	-----	-----	-----	-----
1 Span/Height (ft)	0	0	0	12	0	0	0	0	0	0
1 Start Point (ft)	0	0	0	3	0	0	0	0	0	0
1 End Point (ft)	0	0	0	6	0	0	0	0	0	0
1 Totally Partially Uniform Load (plf)	0	0	0	300	0	0	0	0	0	0
Partially Uniform Load 2	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
POINT LOADS										
Point Load 1	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
1 Location (ft)	0	0	0	3	0	0	0	0	0	0
1 Total Load (lb)	0	0	0	1428	0	0	0	0	0	0
Point Load 2	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Location (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Location (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
TAPERED LOADS										
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	0	0	0	0	0	0
Tapered Load at End (plf)	0	0	0	0	240	0	0	0	0	0
REACTIONS & MOMENT										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	742	1432	1428	3083	3268	2568	1150	1511	29	2525
Right Reaction (lb)	742	1432	1428	3533	3268	2568	1150	1511	29	2525
Max Moment (lb-ft)	556	1432	2142	5961	11437	8987	2156	2644	61	6944
Max Shear (lb)	742	1432	1428	3533	3268	2568	1150	1511	29	2525
C_v	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C_r	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Area (in^2)	21.75	20.79	20.79	33.25	69.19	69.19	33.75	33.75	33.75	37.56
Moment of Inertia I (in^4)	95	245	245	250	1051	1051	356	356	356	451
Maximum Bending Stress (lb-ft)	254	417	624	1359	882	693	409	501	12	1109
Allowable Bending Stress (lb-ft)	1080	2604	2604	2684	2400	2400	900	900	900	2400
Allowable Moment (lb-ft)	2365	8931	8931	11775	31134	31134	4746	4746	4746	15024
MOMENT FS	**4.25**	**6.24**	**4.17**	**1.98**	**2.72**	**3.46**	**2.20**	**1.79**	**77.87**	**2.16**
Allowable Shear Stress (psi)	216	285	285	285	265	265	180	180	180	265
Maximum Shear Capacity (lb)	3132	3950	3950	6318	12223	12223	4050	4050	4050	6636
SHEAR FS	**4.22**	**2.76**	**2.77**	**1.79**	**3.74**	**4.76**	**3.52**	**2.68**	**141.18**	**2.63**
Bearing Required	0.61	1.09	1.09	1.35	0.98	0.77	0.95	1.24	0.02	1.24
Elastic Modulus (psi)	1,600,000	2,000,000	2,000,000	2,000,000	1,800,000	1,800,000	1,600,000	1,600,000	1,600,000	1,800,000
Live Load Deflection (in)	0.00	0.00	0.01	0.05	0.17	0.13	0.03	0.03	0.00	0.15
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.10	0.13	0.20	0.20	0.47	0.47	0.25	0.23	0.28	0.37
LIVE LOAD DEFLECTION FS	**37.64**	**28.02**	**15.10**	**4.19**	**2.81**	**3.61**	**8.25**	**7.16**	**100.00**	**2.48**
Total Load Deflection (in)	0.01	0.01	0.03	0.07	0.22	0.17	0.04	0.04	0.00	0.19
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.15	0.20	0.30	0.30	0.70	0.70	0.38	0.35	0.43	0.55
TOTAL LOAD DEFLECTION FS	**25.13**	**23.48**	**10.46**	**4.09**	**3.25**	**4.13**	**9.69**	**8.46**	**302.34**	**2.92**

Plan: Zollinger
Date: 22 Sep 2015
Location: 6785 E. Via Cortina

	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	LVL (2) 11 7/8"	Sawn (2) 2X8's	LVL (2) 9 1/2"	LVL (2) 9 1/2"	LVL (1) 11 7/8"	LVL (1) 11 7/8"	Sawn (2) 2X8's	Sawn (2) 2X8's	Sawn (3) 2X8's	Sawn (2) 2X8's
	Shear: 1.57	Shear: 4.14	Moment: 2.99	Shear: 2.08	Moment: 1.92	Shear: 7.23	Moment: 2.01	Shear: 3.32	Moment: 1.93	Shear: 4.6
Name	FB-3	FB-4	FB-5	FB-6	FB-7	FB-8	FB-9	FB-10	FB-11	FB-12
Grade	LVL	Sawn	LVL	LVL	LVL	LVL	Sawn	Sawn	Sawn	Sawn
LOADING PARAMETERS										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	50	50	50	50	50	50	50	50	50	50
Roof Live Load (psf)	45	45	45	45	45	45	45	45	45	45
Roof Total Load (psf)	60	60	60	60	60	60	60	60	60	60
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
BEAM SPECIFICATIONS										
Beam Span (ft)	**6.5**	**3**	**7.5**	**6**	**11**	**7**	**3.5**	**3**	**5**	**3**
Beam Weight (plf)	12.06	4.35	9.64	9.64	6.03	6.03	4.35	4.35	6.53	4.35
BEAM SIZING										
Beam Depth (in)	**11.88**	**7.25**	**9.5**	**9.5**	**11.88**	**11.88**	**7.25**	**7.25**	**7.25**	**7.25**
Beam Width/Weight	**3.5**	**3**	**3.5**	**3.5**	**1.75**	**1.75**	**3**	**3**	**4.5**	**3**
UNIFORM LOADING										
Floor Span (ft)	13	16	10	9	8	6	17	25	18	18
Roof Span (ft)	0	0	4	20	0	0	4	0	0	0
Wall Height (ft)	2	5	9	9	0	0	11	0	9	0
Total Uniform Floor Load (plf)	325	400	250	225	200	150	425	625	450	450
Total Uniform Roof Load (plf)	0	0	120	600	0	0	120	0	0	0
Total Uniform Wall Load (plf)	40	100	180	180	0	0	220	0	180	0
PARTIALLY UNIFORM LOADING										
Partially Uniform Load 1	Roof	-----	-----	-----	Roof	-----	-----	-----	-----	-----
1 Span/Height (ft)	36	0	0	0	0	0	0	0	0	0
1 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
1 End Point (ft)	1	0	0	0	0	0	0	0	0	0
1 Totally Partially Uniform Load (plf)	1080	0	0	0	0	0	0	0	0	0
Partially Uniform Load 2	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Span/Height (ft)	36	0	0	0	0	0	0	0	0	0
2 Start Point (ft)	5.5	0	0	0	0	0	0	0	0	0
2 End Point (ft)	6.5	0	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	1080	0	0	0	0	0	0	0	0	0
Partially Uniform Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
POINT LOADS										
Point Load 1	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
1 Location (ft)	1	0	0	0	0	0	0	0	0	0
1 Total Load (lb)	2724	0	0	0	0	0	0	0	0	0
Point Load 2	Roof	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Location (ft)	5.5	0	0	0	0	0	0	0	0	0
2 Total Load (lb)	2724	0	0	0	0	0	0	0	0	0
Point Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Location (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
TAPERED LOADS										
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	5	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	120	0	0	0	0	0
Tapered Load at End (plf)	0	0	0	0	240	0	0	0	0	0
REACTIONS & MOMENT										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	5029	757	2099	3044	1806	546	1346	944	1591	682
Right Reaction (lb)	5029	757	2099	3044	1360	546	1346	944	1591	682
Max Moment (lb-ft)	5119	567	3934	4566	4654	956	1177	708	1989	511
Max Shear (lb)	5029	757	2099	3044	1806	546	1346	944	1591	682
C_v	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C_r	1.00	1.20	1.00	1.00	1.00	1.00	1.20	1.20	1.30	1.20
Area (in^2)	41.58	21.75	33.25	33.25	20.79	20.79	21.75	21.75	32.63	21.75
Moment of Inertia I (in^4)	489	95	250	250	245	245	95	95	143	95
Maximum Bending Stress (lb-ft)	746	259	897	1041	1357	279	537	323	605	233
Allowable Bending Stress (lb-ft)	2604	1080	2684	2684	2604	2604	1080	1080	1170	1080
Allowable Moment (lb-ft)	17862	2365	11775	11775	8931	8931	2365	2365	3844	2365
MOMENT FS	**3.49**	**4.17**	**2.99**	**2.58**	**1.92**	**9.35**	**2.01**	**3.34**	**1.93**	**4.63**
Allowable Shear Stress (psi)	285	216	285	285	285	285	216	216	234	216
Maximum Shear Capacity (lb)	7900	3132	6318	6318	3950	3950	3132	3132	5090	3132
SHEAR FS	**1.57**	**4.14**	**3.01**	**2.08**	**2.19**	**7.23**	**2.33**	**3.32**	**3.20**	**4.60**
Bearing Required	1.92	0.62	0.80	1.16	1.38	0.42	1.11	0.78	0.87	0.56
Elastic Modulus (psi)	2,000,000	1,600,000	2,000,000	2,000,000	2,000,000	2,000,000	1,600,000	1,600,000	1,600,000	1,600,000
Live Load Deflection (in)	0.03	0.00	0.04	0.04	0.16	0.01	0.01	0.01	0.02	0.00
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.22	0.10	0.25	0.20	0.37	0.23	0.12	0.10	0.17	0.10
LIVE LOAD DEFLECTION FS	**6.48**	**25.88**	**6.00**	**5.39**	**2.27**	**17.43**	**12.14**	**16.56**	**7.45**	**23.00**
Total Load Deflection (in)	0.05	0.01	0.08	0.06	0.21	0.02	0.02	0.01	0.04	0.01
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.33	0.15	0.38	0.30	0.55	0.35	0.18	0.15	0.25	0.15
TOTAL LOAD DEFLECTION FS	**7.09**	**24.63**	**4.66**	**5.02**	**2.62**	**20.10**	**10.18**	**19.74**	**6.32**	**27.34**

Plan: Zollinger
Date: 22 Sep 2015
Location: 6785 E. Via Cortina

	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	Sawn (3) 2X10's	Sawn (3) 2X10's	Sawn (2) 2X8's	Sawn (2) 2X10's	LVL (3) 11 7/8"	Sawn (2) 2X8's	Sawn (3) 2X10's	Sawn (2) 2X10's	Sawn (2) 2X8's	LVL (1) 11 7/8"
	Moment: 2.43	Moment: 1.3	Moment: 2.66	Moment: 1.62	LL Deflection: L/412	Shear: 16.79	Moment: 2.26	Shear: 18.84	Shear: 13.53	Shear: 5.55
Name	RB-11	RB-12	RB-3	RB-14	RB-15	RB-16	RB-17	RB-18	FB-1	FB-2
Grade	Sawn	Sawn	Sawn	Sawn	LVL	Sawn	Sawn	Sawn	Sawn	LVL
LOADING PARAMETERS										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	50	50	50	50	50	50	50	50	50	50
Roof Live Load (psf)	45	45	45	45	45	45	45	45	45	45
Roof Total Load (psf)	60	60	60	60	60	60	60	60	60	60
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
BEAM SPECIFICATIONS										
Beam Span (ft)	**6**	**9**	**5**	**9**	**15.5**	**3**	**5**	**2.5**	**3**	**4**
Beam Weight (plf)	8.33	8.33	4.35	5.55	18.09	4.35	8.33	5.55	4.35	6.03
BEAM SIZING										
Beam Depth (in)	**9.25**	**9.25**	**7.25**	**9.25**	**11.88**	**7.25**	**9.25**	**9.25**	**7.25**	**11.88**
Beam Width/Weight	**4.5**	**4.5**	**3**	**3**	**5.25**	**3**	**4.5**	**3**	**3**	**1.75**
UNIFORM LOADING										
Floor Span (ft)	0	0	0	0	0	0	0	6	6	14
Roof Span (ft)	16	11	6	7	0	4	27	0	0	0
Wall Height (ft)	2	5	5	0	0	0	0	0	0	0
Total Uniform Floor Load (plf)	0	0	0	0	0	0	0	150	150	350
Total Uniform Roof Load (plf)	480	330	180	210	0	120	810	0	0	0
Total Uniform Wall Load (plf)	40	100	100	0	0	0	0	0	0	0
PARTIALLY UNIFORM LOADING										
Partially Uniform Load 1	-----	-----	-----	-----	Roof	-----	-----	-----	-----	-----
1 Span/Height (ft)	0	0	0	0	16	0	0	0	0	0
1 Start Point (ft)	0	0	0	0	5	0	0	0	0	0
1 End Point (ft)	0	0	0	0	15.5	0	0	0	0	0
1 Totally Partially Uniform Load (plf)	0	0	0	0	480	0	0	0	0	0
Partially Uniform Load 2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
POINT LOADS										
Point Load 1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1 Location (ft)	0	0	0	0	5	0	0	0	0	0
1 Total Load (lb)	0	0	0	0	2880	0	0	0	0	0
Point Load 2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Location (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Location (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
TAPERED LOADS										
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	5	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	120	0	0	0	0	0
Tapered Load at End (plf)	0	0	0	0	240	0	0	0	0	0
REACTIONS & MOMENT										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	1585	1972	711	970	4537	187	2046	194	232	712
Right Reaction (lb)	1585	1972	711	970	4563	187	2046	194	232	712
Max Moment (lb-ft)	2377	4438	889	2182	20969	140	2557	121	174	712
Max Shear (lb)	1585	1972	711	970	4563	187	2046	194	232	712
C_v	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C_r	1.20	1.20	1.20	1.10	1.00	1.20	1.20	1.10	1.20	1.00
Area (in^2)	41.63	41.63	21.75	27.75	62.37	21.75	41.63	27.75	21.75	20.79
Moment of Inertia I (in^4)	297	297	95	198	734	95	297	198	95	245
Maximum Bending Stress (lb-ft)	445	830	406	612	2038	64	478	34	79	208
Allowable Bending Stress (lb-ft)	1080	1080	1080	990	2604	1080	1080	990	1080	2604
Allowable Moment (lb-ft)	5775	5775	2365	3529	26793	2365	5775	3529	2365	8931
MOMENT FS	**2.43**	**1.30**	**2.66**	**1.62**	**1.28**	**16.91**	**2.26**	**29.09**	**13.62**	**12.54**
Allowable Shear Stress (psi)	216	216	216	198	285	216	216	198	216	285
Maximum Shear Capacity (lb)	5994	5994	3132	3663	11850	3132	5994	3663	3132	3950
SHEAR FS	**3.78**	**3.04**	**4.41**	**3.78**	**2.60**	**16.79**	**2.93**	**18.84**	**13.53**	**5.55**
Bearing Required	0.87	1.08	0.59	0.80	1.16	0.15	1.12	0.16	0.19	0.54
Elastic Modulus (psi)	1,600,000	1,600,000	1,600,000	1,600,000	2,000,000	1,600,000	1,600,000	1,600,000	1,600,000	2,000,000
Live Load Deflection (in)	0.02	0.08	0.01	0.07	0.45	0.00	0.02	0.00	0.00	0.00
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.20	0.30	0.17	0.30	0.52	0.10	0.17	0.08	0.10	0.13
LIVE LOAD DEFLECTION FS	**8.96**	**3.86**	**13.25**	**4.04**	**1.14**	**92.01**	**9.17**	**248.14**	**69.01**	**40.03**
Total Load Deflection (in)	0.03	0.14	0.03	0.10	0.62	0.00	0.02	0.00	0.00	0.00
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.30	0.45	0.25	0.45	0.78	0.15	0.25	0.13	0.15	0.20
TOTAL LOAD DEFLECTION FS	**9.16**	**3.27**	**9.44**	**4.43**	**1.25**	**99.89**	**10.21**	**287.14**	**80.48**	**47.22**

Plan: Zollinger
Date: 22 Sep 2015
Location: 6785 E. Via Cortina

	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	GLB 3 1/8" x 27"	LVL (2) 9 1/2"	Sawn (2) 2X8's	LVL (2) 9 1/2"	Sawn (2) 2X10's	LVL (3) 11 7/8"	LVL (2) 9 1/2"	Sawn (2) 2X10's	Sawn (2) 2X10's	Sawn (3) 2X10's
	Shear: 1.17	Moment: 4.49	Moment: 2.76	Shear: 2.32	Moment: 2.23	Moment: 1.32	Shear: 1.39	Shear: 13.46	Shear: 5.74	Moment: 1.25
Name	RB-1	RB-2	RB-3	RB-4	RB-5	RB-6	RB-7	RB-8	RB-9	RB-10
Grade	GLB	LVL	Sawn	LVL	Sawn	LVL	LVL	Sawn	Sawn	Sawn
LOADING PARAMETERS										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	50	50	50	50	50	50	50	50	50	50
Roof Live Load (psf)	45	45	45	45	45	45	45	45	45	45
Roof Total Load (psf)	60	60	60	60	60	60	60	60	60	60
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
BEAM SPECIFICATIONS										
Beam Span (ft)	**18**	**10**	**5**	**5**	**7.5**	**12**	**7**	**3.5**	**3**	**8**
Beam Weight (plf)	20.52	9.64	4.35	9.64	5.55	18.09	9.64	5.55	5.55	8.33
BEAM SIZING										
Beam Depth (in)	**27**	**9.5**	**7.25**	**9.5**	**9.25**	**11.88**	**9.5**	**9.25**	**9.25**	**9.25**
Beam Width/Weight	**3.13**	**3.5**	**3**	**3.5**	**3**	**5.25**	**3.5**	**3**	**3**	**4.5**
UNIFORM LOADING										
Floor Span (ft)	16	4	2	0	0	0	0	6	0	0
Roof Span (ft)	32	0	4	36	4	37	43	0	14	19
Wall Height (ft)	2	5	5	0	5	0	0	0	0	0
Total Uniform Floor Load (plf)	400	100	50	0	0	0	0	150	0	0
Total Uniform Roof Load (plf)	960	0	120	1080	120	1110	1290	0	420	570
Total Uniform Wall Load (plf)	40	100	100	0	100	0	0	0	0	0
PARTIALLY UNIFORM LOADING										
Partially Uniform Load 1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
1 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
1 End Point (ft)	0	0	0	0	0	0	0	0	0	0
1 Totally Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
POINT LOADS										
Point Load 1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1 Location (ft)	0	0	0	0	0	0	0	0	0	0
1 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
2 Location (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3 Location (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
TAPERED LOADS										
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	0	0	0	0	0	0
Tapered Load at End (plf)	0	0	0	0	0	0	0	0	0	0
REACTIONS & MOMENT										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	12785	1048	686	2724	846	6769	4549	272	638	2313
Right Reaction (lb)	12785	1048	686	2724	846	6769	4549	272	638	2313
Max Moment (lb-ft)	57531	2621	857	3405	1586	20306	7960	238	479	4627
Max Shear (lb)	12785	1048	686	2724	846	6769	4549	272	638	2313
C_v	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C_r	1.00	1.00	1.20	1.00	1.10	1.00	1.00	1.10	1.10	1.20
Area (in^2)	84.51	33.25	21.75	33.25	27.75	62.37	33.25	27.75	27.75	41.63
Moment of Inertia I (in^4)	5134	250	95	250	198	734	250	198	198	297
Maximum Bending Stress (lb-ft)	1815	597	391	776	445	1973	1814	67	134	865
Allowable Bending Stress (lb-ft)	2400	2684	1080	2684	990	2604	2684	990	990	1080
Allowable Moment (lb-ft)	76059	11775	2365	11775	3529	26793	11775	3529	3529	5775
MOMENT FS	**1.32**	**4.49**	**2.76**	**3.46**	**2.23**	**1.32**	**1.48**	**14.83**	**7.37**	**1.25**
Allowable Shear Stress (psi)	265	285	216	285	198	285	285	198	198	216
Maximum Shear Capacity (lb)	14930	6318	3132	6318	3663	11850	6318	3663	3663	5994
SHEAR FS	**1.17**	**6.03**	**4.57**	**2.32**	**4.33**	**1.75**	**1.39**	**13.46**	**5.74**	**2.59**
Bearing Required	6.28	0.40	0.56	1.04	0.70	1.72	1.73	0.22	0.53	1.27
Elastic Modulus (psi)	1,800,000	2,000,000	1,600,000	2,000,000	1,600,000	2,000,000	2,000,000	1,600,000	1,600,000	1,600,000
Live Load Deflection (in)	0.27	0.04	0.01	0.02	0.02	0.27	0.11	0.00	0.00	0.08
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.60	0.33	0.17	0.17	0.25	0.40	0.23	0.12	0.10	0.27
LIVE LOAD DEFLECTION FS	**2.23**	**9.17**	**13.76**	**7.25**	**12.23**	**1.50**	**2.21**	**90.34**	**54.60**	**3.18**
Total Load Deflection (in)	0.37	0.10	0.03	0.03	0.05	0.36	0.14	0.00	0.00	0.11
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.90	0.50	0.25	0.25	0.38	0.60	0.35	0.18	0.15	0.40
TOTAL LOAD DEFLECTION FS	**2.45**	**5.25**	**9.78**	**8.08**	**7.32**	**1.66**	**2.47**	**104.54**	**60.62**	**3.53**

Plan: Zollinger
Date: 22 Sep 2015
Location: 6785 E. Via Cortina

	PASS FS: 1.88	PASS FS: 1.25	PASS FS: 1.67
INPUT			
Location:	2	2	2
Callout	S-24	S-24	S-36
Load (lb)	3,200	4,800	8,100
SPECS			
Soil Bearing Pressure (psf)	1500	1500	1500
Footing Width/Diameter (in)	24	24	36
Footing Length/Diameter (in)	24	24	36
Footing Depth (in)	10	10	10
CALCULATIONS			
Area Required (ft^2)	2.13	3.20	5.40
Area Provided (ft^2)	4.00	4.00	9.00
SELECTION	**S-24 24" Square by 10" Deep Concrete Footing with (2) #4 Bars Each Way**	**S-24 24" Square by 10" Deep Concrete Footing with (2) #4 Bars Each Way**	**S-36 36" Square by 10" Deep Concrete Footing with (4) #4 Bars Each Way**