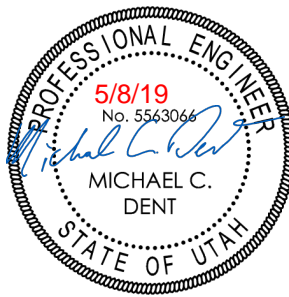




Structural Design  
(801) 876-3501



Structural Calculations

DAVIES  
Parcel C-876 East Rosefield Lane, Draper

Prepared For:



Landforms Design  
16 East 100 South  
Bountiful, UT 84010

5/8/2019

5/8/2019

## STRUCTURAL CALCULATIONS

For: Landforms Design  
Plan #: DAVIES  
Location: Parcel C-876 East Rosefield Lane, Draper

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

Design Criteria 2015 IBC:

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 = 58 pcf, slope not to exceed 20%, setback from slopes is min. 25'

Dimensional Lumber: Doug Fir #2 or better (No changes to foundation steel per York Eng.) mts

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 bring a request to the attention of the York Engineering prior to construction. Prefab 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 2015 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 two plates is not permitted without special engineering.
12. Minimum strength requires 2,500 PSI concrete; however, as per IRC 402.2 3,000 PSI concrete shall be used.
13. All exterior walls shall be sheathed with 7/16" APA rated structural wood panel.
14. Block all horizontal edges 1 1/2" nominal or wider.
15. 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.



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**SNOW CALCULATION:**

County: Salt Lake  
Elevation: 4500

$P_0$  43  
S 63  
 $A_0$  4.5  
 $P_g$  (psf) 43  
Ce 1  
 $C_t$  1  
I 1  
 $C_s$  1

**$P_f$  (psf) 40**

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

LOCATION	PASS	PASS	PASS	PASS	PASS
	Back FS: 1.46 DL+0.75LL+0.75S	Front FS: 1.61 DL+0.75LL+0.75S	Left FS: 1.78 DL+S	Right FS: 1.78 DL+S	Interior FS: 9.09 DL+0.75LL+0.75S
<b>SOIL SPECS</b>					
Density (pcf)	125	125	125	125	125
Soil Pressure (psf)	1500	1500	1500	1500	1500
Weight (k/ft)	0.04	0.04	0.04	0.04	0.04
<b>BUILDING LOADS</b>					
Roof Span (ft)	33	33	33	33	0
Floor Span (ft)	16	16	4	4	0
Wall Height (ft)	18	10	10	10	0
Suspended Slab Span (ft)	0	0	0	0	0
Total Load (k/ft)	1.44	1.28	1.13	1.13	0.00
<b>FOOTING SPECS</b>					
Footing Width (in)	20	20	20	20	20
Footing Height (in)	10	10	10	10	10
<b>FOUNDATION</b>					
Height Above Grade (ft)	0.67	0.67	0.67	0.67	0.67
Wall Thickness (ft)	0.67	0.67	0.67	0.67	0.67
Weight (k/ft)	0.07	0.07	0.07	0.07	0.07
<b>CONCRETE SPECS</b>					
Density (pcf)	150	150	150	150	150
Strength (psi)	2500	2500	2500	2500	2500
Clear Cover Thickness (in)	3	3	3	3	3
<b>CALCULATIONS</b>					
Total Weight on Soil (k/ft)	1.71	1.55	1.41	1.41	0.28
Soil Load (ksf)	1.03	0.93	0.84	0.84	0.17
<b>FOOTING SELECTION</b>	<b>F-20</b>	<b>F-20</b>	<b>F-20</b>	<b>F-20</b>	<b>F-20</b>

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

LOADING SUMMARY	
Roof Live Load (psf):	40
Roof Dead Load (psf):	15
Floor Live Load (psf):	40
Floor Dead Load (psf):	12
Exterior Wall Dead Load (psf):	20
Interior Wall Dead Load (psf):	10
Suspended Slab Dead Load (psf):	75
Suspended Slab Live Load (psf):	60
SNOW LOAD PARAMETERS	
Roof Slope (x/12):	8
Roof Pitch (θ):	33.69
Total Roof Load (psf):	55.00
SEISMIC LOAD PARAMETERS	
Site Class:	D
F <sub>a</sub> :	1.00
R:	6.5
S <sub>S</sub> :	1.491
S <sub>M5</sub> :	1.491
S <sub>D5</sub> :	0.993
C <sub>S</sub> :	0.153
Redundancy Factor, ρ :	1.30
ASD Load Combination Factor:	0.70
Factored C <sub>s</sub> :	0.139
SHEAR DISTRIBUTION	
Base Shear Force lb:	35,113
Floor 1 Lateral Force lb:	11,344
Floor 2 Lateral Force lb:	0
Roof Lateral Force lb:	23,769
Diaphragm Loading (plf):	149
<b>Diaphragm FS</b>	<b>1.14</b>

DIAPHRAGM LOADING									
	Avg. Length (ft)	Avg. Width (ft)	Wall Height (ft)	Dead Wgt. (psf)	Snow Wgt. (psf)	Diaphragm Weight (lb)	Wall Weight (lb)	Total Weight (lb)	Shear (lb)
<b>Roof</b>	91.3	66.4	---	15	8	139,433	31,540	170,973	23,769
<b>Floor 2</b>	91.3	66	0	12		0	31,540	0	0
<b>Floor 1</b>	91.3	66	10	12		40,596	41,002	81,598	11,344

SEISMIC FORCE DISTRIBUTION							
	H <sub>x</sub> (ft)	W <sub>x</sub> (kip)	H <sub>x</sub> x W <sub>x</sub>	% Force	Total Shear (kip)	F <sub>x</sub>	V <sub>x</sub>
<b>Roof</b>	18.00	170.97	3,078	93%	32.53	32.53	32.53
<b>Floor 2</b>	0.00	0.00	0	0%	32.53	0.00	32.53
<b>Floor 1</b>	3.00	81.60	245	7%	35.11	2.59	35.11
<b>TOTALS</b>	0.01	252.57	3,322	35.113	---	---	35.11

Plan: DAVIES  
Date: 5/8/2019  
Location: Parcel C-876 East Rosefield Lane, Draper

	Seismic (kips)		Wind (kips)		Shear Wall Allowable Loads (plf)			
	total	1	left/right	front/back	seismic	wind	seismic	wind
2nd Floor	0.0	0.0	0.0	0.0	T-1	240	336	
1st Floor	32.5	23.8	16.6		T-2	350	490	
Basement	2.6	12.8	8.8		T-3	450	630	
					T-4	585	819	

Location	Wardrobe	Laundry	airEntry/Mu	Autos	Autos Mid	3rd Car	RV	RV/Guest	Dining/Bath	Dining/Bath	Great	Great
	Front side	Front side	Front side	Front side	front/Back ml	Front side	Front side	Back side	Back side	Left side	Back side	Left side
Floor	1	1	1	1	1	1	1	1	1	1	1	1
Lines up w/	none	none	none	none	none	none	none	none	none	none	none	none
Width	16	7.66	30	23	23	17.5	14	30	0	0	0	0
Depth	40	29.33	32	24	62	55	58	56	0	0	0	0
Area (sqft)	320	112.3339	670	276	750	481.25	406	887.25	810	460	402.5	180
Force (lb)	1717	603	3595	1481	4024	2582	2178	4760	4346	2468	2159	966
Adj. Force	1793	630	3755	1547	4203	2697	2275	4973	4540	2558	2256	1001
% of floor	6%	2%	12%	5%	13%	8%	7%	15%	14%	8%	7%	3%
Fir. Diaphragm	0	0	0	0	0	0	0	0	0	0	0	0
Transferred Source	none	none	none	none	none	1-front-RV	none	none	Left-Dining/BI	none	1-Left-Great	none
Transferred Forces	0	0	0	0	4973	2275	0	0	3324	0	300	0
Forces from Upper	0	0	0	0	0	0	0	0	0	0	0	0
Total Seismic	1793	630	3755	1547	9176	4973	2275	4973	7863	2558	2556	1001
Wind (lb)	874	307	1830	754	2048	1314	1109	2423	2212	1805	1099	706
Adj. Force	913	321	1912	787	2140	1373	1158	2532	2311	1871	1148	732
% of total	6%	2%	12%	5%	13%	8%	7%	15%	14%	8%	7%	3%
Total Wind	913	321	1912	787	2140	2532	1158	2532	4742	1871	1368	732
Shear Wall	11	FTW	8	FTW	11.5	WSW24X12	Dragged	13	16	Transferred	Drag	Transferred
Aspect Ratio	1	(1)	0.84	(2)	1	x2	3rd Car	0.9	1	Dining/Bath	Dining/Bath	Great
PSW Adj. C <sub>o</sub>	0.8	1	1	1	1	1	1	1	0.8	1	1	1
Seis Load (plf)	163		469		798			383		491		
Wind Load (plf)	83.0		239.0		186.1			194.7		296.4		
Shear Wall	T-1	T-1	T-4		DBL T-3	WSW24X12		T-3		DBL T-2		

Uplift												
% Force on pier	100%	100%	50%	100%	61%	50%	100%	31%	100%	100%	100%	100%
Wall Length (ft)	16	FTW	4	FTW	7	2	Dragged	4	19	Transferred	Drag	Transferred
Wall Height (ft)	10	10	13	10	10	12	10	10	10	10	10	10
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Wall Load (plf)	200	200	260	200	200	240	200	200	200	200	200	200
Total DL (plf)	120	120	156	120	120	144	120	120	120	120	120	120
Seis. Uplift (lbs)	201	-	5790	-	7559	-	-	3585	3748	-	-	-
Wind Uplift (lbs)	0	-	2794	-	1441	-	-	1707	1695	-	-	-
(H5)HDU11 (H3)STHD14SEE CALCS H3(STHD14)(H3)STHD14												

Location	Sitting	Master Suite	Master	Autos	3rd Car MID	Autos	RV
	Back side	Back side	Left side	Left side	Left/Right mic	Right side	Right side
Floor	1	1	1	1	1	1	1
Lines up w/	none	none	none	none	none	none	none
Width	23	16	40	16	55	23	57
Depth	32	40	80	23	110	24	30
Area (sqft)	368	320	1390	314	2165	484	855
Force (lb)	1974	1717	7458	1685	11616	2597	4587
Adj. Force	2063	1793	7731	1746	12041	2692	4755
% of floor	6%	6%	24%	5%	37%	8%	15%
Fir. Diaphragm	0	0	0	0	0	0	0
Transferred Source	none	none	none	none	none	none	none
Transferred Forces	0	0	0	0	0	0	0
Forces from Upper	0	0	0	0	0	0	0
Total Seismic	2063	1793	7731	1746	12041	2692	4755
Wind (lb)	1005	874	5454	1232	8495	1899	3355
Adj. Force	1050	913	5654	1277	8806	1969	3478
% of total	6%	6%	24%	5%	37%	8%	15%
Total Wind	1050	913	5654	1277	8806	1969	3478
Shear Wall	FTW	7	17	14	27	Portal	41
Aspect Ratio	(3)	0.89	1	1	1	Frame	1
PSW Adj. C <sub>o</sub>	1	1	1	1	1	1	0.7
Seis Load (plf)	256		455		125		446
Wind Load (plf)	130.4		332.6		91.2		326.1
Shear Wall	T-2		T-4		T-1		T-3
Uplift							
% Force on pier	100%	50%	47%	100%	100%	100%	100%
Wall Length (ft)	FTW	3.5	8	14	27	23	57
Wall Height (ft)	10	10	10	10	10	10	10
Floor Span (ft)	0	0	0	0	0	0	0
Roof Span (ft)	0	0	0	0	0	0	0
Wall Load (plf)	200	200	200	200	200	200	200
Total DL (plf)	120	120	120	120	120	120	120
Seis. Uplift (lbs)	-	2352	4068	407	2840	-	0
Wind Uplift (lbs)	-	1094	2846	72	1641	-	0
(H2)STHD10 (H4)HTTS N/A (H1)LSTHD8 H3(sthd14)							

Location	Bunk	Rec	Rec
	Back side	Back side	Left side
Floor	0	0	0
Lines up w/	1-back-Sitting	none	none
Width	23	0	0
Depth	30	0	0
Area (sqft)	345	285	165
Force (lb)	147	122	70
Adj. Force	147	122	70
% of floor	6%	5%	3%
Fir. Diaphragm	24	20	11
Transferred Source	none	0-Left-Rec	none
Transferred Forces	0	475	0
Forces from Upper	2093	0	0
Total Seismic	2414	765	475
Wind (lb)	501	413	347
Adj. Force	501	413	347
% of total	6%	5%	3%
Total Wind	1550	761	347
Shear Wall	8.66	Transf	Transferred
Aspect Ratio	1	to	Rec
PSW Adj. C <sub>o</sub>	0.9	Fnd wall	
Seis Load (plf)	279		
Wind Load (plf)	179.0		
Shear Wall	T-2		
Uplift			
% Force on pier	100%	100%	100%
Wall Length (ft)	23	Transf	Transferred
Wall Height (ft)	8	8	8
Floor Span (ft)	0	0	0
Roof Span (ft)	0	0	0
Wall Load (plf)	160	160	160
Total DL (plf)	96	96	96
Seis. Uplift (lbs)	0	-	-
Wind Uplift (lbs)	0	-	-
(H1)LSTHD8			



Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

Laundry First Floor Front Side

**LOAD PARAMETERS**

Seismic Load (lb):	630
Wind Load (lb):	321

**SHEAR WALL SELECTION**

Shear Wall Callout:	T-1
Seismic Strength (lb/ft):	240
Edge Nailing (in o.c.):	6
Field Nailing (in o.c.):	12
<b>Seismic FS</b>	<b>1.43</b>
<b>Wind FS</b>	<b>3.93</b>

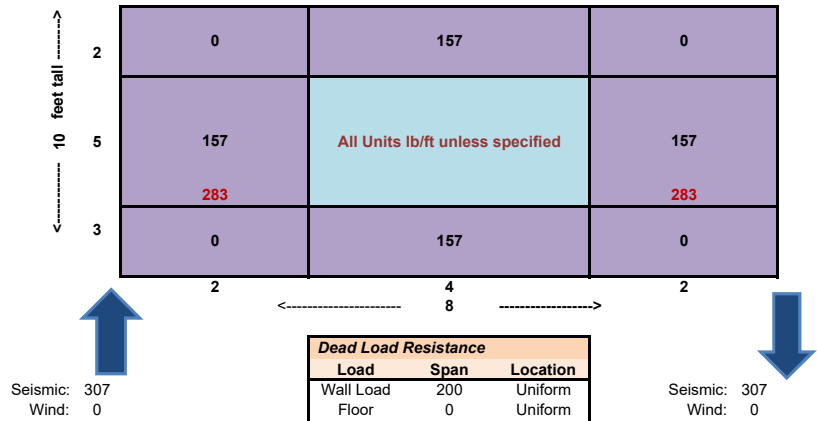
**ASPECT RATIO**

Left Aspect Ratio:	94%
Right Aspect Ratio:	94%

**CONNECTORS**

Force-Transfer Wall Location:	Interfloor
Tie-Down:	CS16X32
<b>Tie-Down Seismic FS</b>	<b>2.52</b>
<b>Tie-Down Wind FS</b>	<b>Not Needed</b>
Window Strap:	CS16
Window Strap Connector:	Nails
<b>Strap FS</b>	<b>6.02</b>
Bolt Diameter (in):	1/2
Bolt Spacing (in o.c.):	32
Bolt Capacity (plf):	390
<b>Bolt FS</b>	<b>4.96</b>
Stud Size:	2x4
Tension (lb):	551
Stress (psi):	113
F <sub>T</sub> (psi):	920
<b>Stud FS:</b>	<b>8.14</b>

**FORCE TRANSFER WALL**



FORCE TRANSFER WALL DESIGN	
Shear Wall:	T-1 --- 6" Edge Nailing and 12" Field Nailing
Tie-Down:	CS16X32
Straps:	CS16 --- Nails to Connect
Bolts:	1/2" Bolts @ 32" O.C.
Studs:	2x4 Studs

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

Autos First Floor Front Side

**LOAD PARAMETERS**

Seismic Load (lb):	773
Wind Load (lb):	394

**SHEAR WALL SELECTION**

Shear Wall Callout:	T-1
---------------------	-----

Seismic Strength (lb/ft):	240
Edge Nailing (in o.c.):	6
Field Nailing (in o.c.):	12
<b>Seismic FS</b>	<b>1.24</b>
<b>Wind FS</b>	<b>3.41</b>

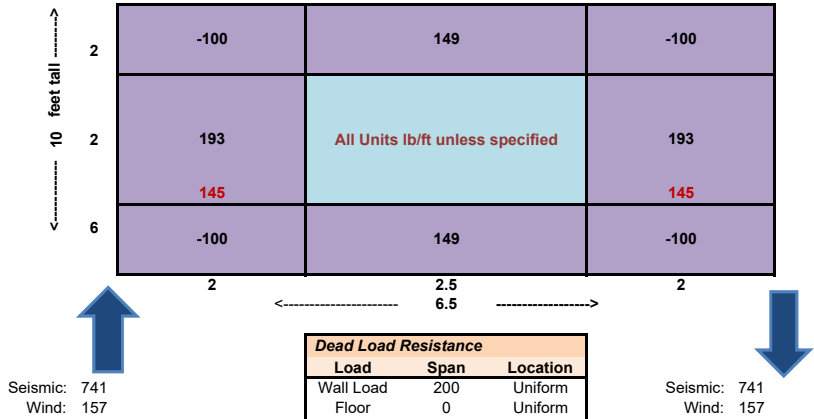
**ASPECT RATIO**

Left Aspect Ratio:	100%
Right Aspect Ratio:	100%

**CONNECTORS**

Force-Transfer Wall Location:	Corner
Tie-Down:	LSTHD8/RJ
<b>Tie-Down Seismic FS</b>	<b>2.63</b>
<b>Tie-Down Wind FS</b>	<b>14.75</b>
Window Strap:	CS16
Window Strap Connector:	Nails
<b>Strap FS</b>	<b>11.76</b>
Bolt Diameter (in):	1/2
Bolt Spacing (in o.c.):	32
Bolt Capacity (plf):	390
<b>Bolt FS</b>	<b>3.28</b>
Stud Size:	2x4
Tension (lb):	833
Stress (psi):	171
F <sub>T</sub> (psi)	920
<b>Stud FS:</b>	<b>5.38</b>

**FORCE TRANSFER WALL**



Dead Load Resistance		
Load	Span	Location
Wall Load	200	Uniform
Floor	0	Uniform
Roof	4	Uniform
Point Load	0	0

FORCE TRANSFER WALL DESIGN	
Shear Wall:	T-1 --- 6" Edge Nailing and 12" Field Nailing
Tie-Down:	LSTHD8/RJ
Straps:	CS16 --- Nails to Connect
Bolts:	1/2" Bolts @ 32" O.C.
Studs:	2x4 Studs

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

Sitting First Floor Back Side

**LOAD PARAMETERS**

Seismic Load (lb):	2,063
Wind Load (lb):	1,050

**SHEAR WALL SELECTION**

Shear Wall Callout:	T-2
---------------------	-----

Seismic Strength (lb/ft):	350
Edge Nailing (in o.c.):	4
Field Nailing (in o.c.):	12
<b>Seismic FS</b>	<b>1.10</b>
<b>Wind FS</b>	<b>3.03</b>

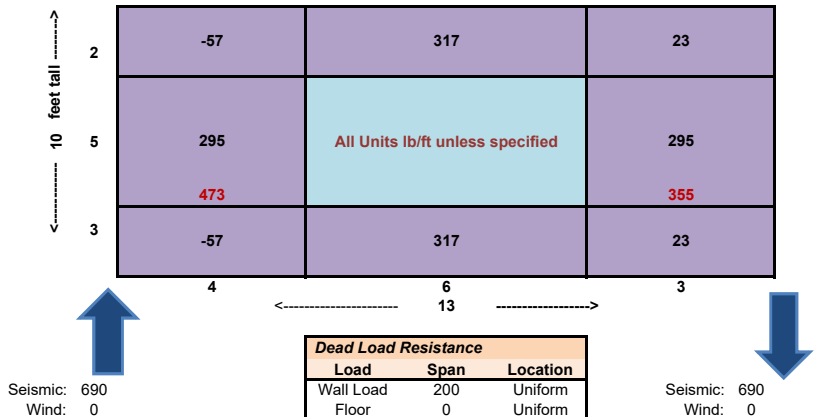
**ASPECT RATIO**

Left Aspect Ratio:	100%
Right Aspect Ratio:	100%

**CONNECTORS**

Force-Transfer Wall Location:	Interfloor
Tie-Down:	MST37
<b>Tie-Down Seismic FS</b>	<b>3.93</b>
<b>Tie-Down Wind FS</b>	<b>Not Needed</b>
Window Strap:	CS16
Window Strap Connector:	Nails
<b>Strap FS</b>	<b>3.60</b>
Bolt Diameter (in):	1/2
Bolt Spacing (in o.c.):	32
Bolt Capacity (plf):	390
<b>Bolt FS</b>	<b>2.46</b>
Stud Size:	2x4
Tension (lb):	1,111
Stress (psi):	228
F <sub>T</sub> (psi)	920
<b>Stud FS:</b>	<b>4.04</b>

**FORCE TRANSFER WALL**



Dead Load Resistance		
Load	Span	Location
Wall Load	200	Uniform
Floor	0	Uniform
Roof	4	Uniform
Point Load	0	0

FORCE TRANSFER WALL DESIGN	
Shear Wall:	T-2 --- 4" Edge Nailing and 12" Field Nailing
Tie-Down:	MST37
Straps:	CS16 --- Nails to Connect
Bolts:	1/2" Bolts @ 32" O.C.
Studs:	2x4 Studs

Plan: DAVIES  
Date: 5/8/2019

Location: Parcel C-876 East Rosefield Lane, Drap **LEFT AND RIGHT LOADING**

**Wind Loading Calculations using Main Windforce-Resisting System (MWFRS)**

**Longitudinal Direction**

**Table 27.5-1 Steps to Determine MWFRS Loads Enclosed Simple Diaphragm Buildings**

Risk Category	<b>II</b>	Table 1.5-1	
Wind speed	<b>115</b>	Figure 26.5-1 A-B or C	
Exposure Category	<b>C</b>	Section 26.7	
L/B upper floor	0.73		
L/B main floor	0.73		
Roof Height	10.00		
Mean roof Height	18.0		
<b>Truss Span</b>	<b>30</b>		
Roof Slope	8 /12		
Roof Angle (deg)	27.60	Sine = 0.4633	
<b>Lower Truss Span</b>	<b>30</b>		
Lower roof Slope	8 /12		
Lower roof Angle (deg)	27.60	Sine = 0.4633	
Load combination factor	0.6	(ASCE 7-10 2.4.1)	
Upper floor, p <sub>n</sub>	27.6	Table 27.6-1	
Upper floor, p <sub>o</sub>	27.6	Table 27.6-1	
Main floor, p <sub>n</sub>	27.6		
Main floor, p <sub>o</sub>	27.6		
Basement floor, p <sub>n</sub>	27.6		
Basement floor, p <sub>o</sub>	27.6		
<b>Upper Floor (psf)</b>			
Net Pressure	16.6	Windward	10.3
		Leeward	6.3
		Left	8.9
		Right	8.9
<b>Main Floor (psf)</b>			
Net Pressure	16.6	Windward	10.3
		Leeward	6.3
		Left	8.9
		Right	8.9
<b>Basement Floor (psf)</b>			
Net Pressure	16.6	Windward	10.3
		Leeward	6.3
		Left	8.9
		Right	8.9
<b>Roof (psf)</b>			
Load Case 1	Zone 1	Zone 2	Exposure Adj. Factor 1.000
Load Case 2	-6.0	-10.5	
	7.5	-5.0	
<b>Lower Roof (psf)</b>			
Load Case 1	-5.8	-10.1	
Load Case 2	7.2	-4.9	
<b>Roof Load</b>			
Roof Height	Length	Area (ft <sup>2</sup> )	Horizontal Force (lbs)
10.00	110.00	1100.0	13768
<b>Lower Roof Load</b>			
Low Roof Height	Upper Length	Lower length	Low Roof Length(ft)
0.0	110	110	0
		Area (ft <sup>2</sup> )	Horizontal Force (lbs)
		0.0	0.0
<b>Wall Load</b>			
	<b>Basement</b>	(height) 3	<b>1st floor</b>
		(height) 11	<b>2nd floor</b>
		(height) 0	
	ft <sup>2</sup>	force (lbs)	ft <sup>2</sup>
Windward	330	3388.2	1210
Leeward	330	2076.6	1210
		12423.3	0
		7614.3	0
		0	0.0
		0	0.0
<b>2nd Floor Diaphragm Shear</b>			
Total Shear (lbs)	13768		
Right Wall Length	0		
Left Wall Length	0		
<b>1st Floor Diaphragm Shear</b>			
Total Shear (lbs)	23786		
Right Wall Length	0		
Left Wall Length	0		
<b>Basement Diaphragm Shear</b>			
Total Shear (lbs)	36538		
Right Wall Length	0		
Left Wall Length	0		
<b>Base Wind Shear</b>	39270		
<b>Hurricane Ties</b>			
<b>Uplift</b>		<b>Factors of Safety</b>	
	(lbs)	H1	H2.5
Roof (per truss)	-22.0	<b>-26.64</b>	<b>-27.32</b>
Low roof (per truss)	-	-	-
<b>Lateral</b>			
	(lbs)	H1	H2.5
Roof (per truss)	2.3	<b>345.66</b>	<b>180.54</b>
Low roof (per truss)	0.0	-	-

Plan: DAVIES  
Date: 5/8/2019

Location: Parcel C-876 East Rosefield Lane, Drap **FRONT AND BACK LOADING**

**Wind Loading Calculations using Main Windforce-Resisting System (MWFRS)**

**Transverse Direction**

**Table 27.5-1 Steps to Determine MWFRS Loads Enclosed Simple Diaphragm Buildings**

Risk Category	<b>II</b>	Table 1.5-1	
Wind speed	<b>115</b>	Figure 26.5-1 A-B or C	
Exposure Category	<b>C</b>	Section 26.7	
L/B upper floor	1.38		
L/B main floor	1.38		
Roof Height	10.00		
Mean roof Height	9.0		
<b>Truss Span</b>	<b>30</b>		
Roof Slope		8 /12	
Roof Angle (deg)	27.60		Sine = 0.4633
<b>Lower Truss Span</b>	<b>30</b>		
Lower roof Slope		8 /12	
Lower roof Angle (deg)	27.60		Sine = 0.4633
Load combination factor	0.6	(ASCE 7-10 2.4.1)	
Upper floor, p <sub>n</sub>	26.2	Table 27.6-1	
Upper floor, p <sub>o</sub>	26.2	Table 27.6-1	
Main floor, p <sub>n</sub>	26.2		
Main floor, p <sub>o</sub>	26.2		
Basement floor, p <sub>n</sub>	26.2		
Basement floor, p <sub>o</sub>	26.2		
<b>Upper Floor (psf)</b>			
Net Pressure	15.7	Windward	10.4
		Leeward	5.3
		Left	7.9
		Right	7.9
<b>Main Floor (psf)</b>			
Net Pressure	15.7	Windward	10.4
		Leeward	5.3
		Left	7.9
		Right	7.9
<b>Basement Floor (psf)</b>			
Net Pressure	15.7	Windward	10.4
		Leeward	5.3
		Left	7.9
		Right	7.9
<b>Roof (psf)</b>			
Load Case 1	Zone 1	Zone 2	Exposure Adj. Factor 1.000
Load Case 2	-5.8	-10.1	
	7.2	-4.9	
<b>Lower Roof (psf)</b>			
Load Case 1	-5.8	-10.1	
Load Case 2	7.2	-4.9	
<b>Roof Load</b>			
Roof Height	Length	Area (ft <sup>2</sup> )	Horizontal Force (lbs)
10.00	80.00	800	9648
<b>Lower Roof Load</b>			
Lower Roof Height	Upper Length	Lower length	Low Roof Length(ft)
0.0	80	80	0
		Area (ft <sup>2</sup> )	Horizontal Force (lbs)
		0	0.0
<b>Wall Load</b>			
	<b>Basement</b>	(height) 3	<b>1st floor</b>
		(height) 11	<b>2nd floor</b>
		(height) 0	
	ft <sup>2</sup>	force (lbs)	ft <sup>2</sup>
Windward	240	2492.4	880
Leeward	240	1276.8	880
		ft <sup>2</sup>	force (lbs)
		9138.7	0
		0	0.0
		0	0.0
<b>2nd Floor Diaphragm Shear</b>			
Total Shear (lbs)	9648		
Front Wall Length	0		
Back Wall Length	0		
<b>1st Floor Diaphragm Shear</b>			
Total Shear (lbs)	16558		
Front Wall Length	0		
Back Wall Length	0		
<b>Basement Diaphragm Shear</b>			
Total Shear (lbs)	25353		
Front Wall Length	0		
Back Wall Length	0		
<b>Base Wind Shear</b>			
	27238		
<b>Hurricane Ties</b>			
		<b>Factors of Safety</b>	
<b>Uplift</b>	(lbs)	H1	H2.5
Roof (per truss)	-30.6	<b>-19.12</b>	<b>-19.61</b>
Low roof (per truss)	-	-	-
<b>Lateral</b>	(lbs)	H1	H2.5
Roof (per truss)	120.6	<b>6.51</b>	<b>3.40</b>
Low roof (per truss)	0.0	-	-

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

<b>PASS</b>	
	TL Deflection: 1.73
<b>JOIST SPECIFICATION</b>	<b>Boise Cascade</b>
Joist Type:	BCI
Joist Series:	90
Joist Depth (ft):	11.88
Joist Span (ft):	21.5
Joist Spacing (in):	16
<b>LOAD PARAMETERS</b>	
Floor Dead Load	12
Floor Live Load	40
Total Floor Load	52
<b>SIMPLE SPAN JOIST</b>	
Duration Increase	1
Joist Weight (plf)	3.9
Joist Loading (plf)	73
Max Reaction (lb)	787
Max Moment (ft-lb)	4232
<b>JOIST DETERMINATION</b>	
Max Moment 100% (ft-lb)	9550
<b>Moment FS</b>	<b>2.26</b>
Max Shear 100% (lb)	2150
<b>Shear FS</b>	<b>2.73</b>
Bearing Required (in)	2.00
Live Load Deflection Limit	240
Live Load Deflection (in)	0.45
Allowable Live Load Deflection (in)	1.08
<b>LL Deflection FS</b>	<b>2.37</b>
Total Load Deflection Limit	240
Total Load Deflection (in)	0.62
Allowable Total Load Deflection (in)	1.08
<b>TL Deflection FS</b>	<b>1.73</b>
1 3/4" Allowable Reaction (lb)	1425
3 1/2" Allowable Reaction (lb)	1800
<b>SELECTION</b>	<b>11 7/8" BCI 90 @ 16" O.C.</b>

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

**Beam Page 1**

RB-1 (2) 2X10's DF #2  
 RB-2 (2) 2X10's DF #2  
 RB-3 (2) 2X10's DF #2  
 RB-4 (2) 2X10's DF #2  
 RB-5 (2) 2X10's DF #2  
 RB-6 (3) 2X10's DF #2  
 RB-7 (2) 2X10's DF #2  
 RB-8 (2) 2X10's DF #2  
 RB-9 (2) 2X10's DF #2  
 RB-10 (2) 2X10's DF #2

**Beam Page 2**

RB-11 5 1/8" x 15" GLB 24F-V4  
 RB-12 (2) 9 1/2" LVL 2.0E 2600 Fb  
 RB-13 (2) 11 7/8" LVL 2.0E 2600 Fb  
 RB-14 (2) 2X10's DF #2  
 RB-15 (2) 2X10's DF #2  
 RB-16 (2) 2X10's DF #2  
 RB-17 (2) 9 1/2" LVL 2.0E 2600 Fb  
 RB-18 (2) 2X10's DF #2  
 RB-19 (2) 2X10's DF #2  
 RB-20 (2) 2X10's DF #2

**Beam Page 3**

RB-21 (2) 2X10's DF #2  
 RB-22 (2) 2X10's DF #2  
 RB-23 (2) 14" LVL 2.0E 2600 Fb  
 RB-24 (3) 11 7/8" LVL 2.0E 2600 Fb  
 RB-25 (3) 11 7/8" LVL 2.0E 2600 Fb  
 RB-26 W12x35 Steel Gr 50  
 RB-27 (2) 2X10's DF #2  
 RB-28 (3) 14" LVL 2.0E 2600 Fb  
 RB-29 (2) 9 1/2" LVL 2.0E 2600 Fb  
 RB-30 (2) 2X10's DF #2

**Beam Page 4**

RB-31 (2) 2X10's DF #2  
 RB-32 (2) 2X10's DF #2  
 RB-33 (2) 2X10's DF #2  
 RB-34 (3) 2X10's DF #2  
 RB-35 (2) 2X10's DF #2  
 RB-36 (2) 18" LVL 2.0E 2600 Fb  
 RB-37 (2) 2X10's DF #2  
 RB-38 (2) 2X10's DF #2  
 RB-39 (2) 2X10's DF #2  
 RB-40 (2) 2X10's DF #2

**Beam Page 5**

RB-41 (2) 9 1/2" LVL 2.0E 2600 Fb  
 RB-42 (2) 2X10's DF #2  
 RB-43 (2) 2X10's DF #2  
 RB-44 (2) 11 7/8" LVL 2.0E 2600 Fb

**Beam Page 6**

MFB-1 (2) 2X10's DF #2  
 MFB-2 (2) 2X10's DF #2  
 MFB-3 (2) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-4 (1) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-5 (2) 2X10's DF #2  
 MFB-6 W10x49 Steel Gr 50  
 MFB-7 (2) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-8 (2) 2X10's DF #2  
 MFB-9 (2) 2X10's DF #2  
 MFB-10 (2) 2X10's DF #2

**Beam Page 7**

MFB-11 (2) 2X10's DF #2  
 MFB-12 (2) 2X10's DF #2  
 MFB-13 (2) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-14 (2) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-15 (2) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-16 (2) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-17 W10x22 Steel Gr 50  
 MFB-18 (2) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-19 (3) 11 7/8" LVL 2.0E 2600 Fb  
 MFB-20 (2) 11 7/8" LVL 2.0E 2600 Fb

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

	PASS (2) 2X10's DF #2	PASS (2) 2X10's DF #2	PASS (2) 2X10's DF #2	PASS (2) 2X10's DF #2	PASS (2) 2X10's DF #2	PASS (3) 2X10's DF #2	PASS (2) 2X10's DF #2	PASS (2) 2X10's DF #2	PASS (2) 2X10's DF #2	PASS (2) 2X10's DF #2
Controlling Load Case	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S
Name	RB-1	RB-2	RB-3	RB-4	RB-5	RB-6	RB-7	RB-8	RB-9	RB-10
Grade	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2
Shear: 9.42	Shear: 3.91	Moment: 2.68	Shear: 1.75	Moment: 1.48	Moment: 1.38	Moment: 2.25	Moment: 3.52	Moment: 3.29	Moment: 2.29	
<b>LOADING PARAMETERS</b>										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	52	52	52	52	52	52	52	52	52	52
Roof Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Roof Total Load (psf)	55	55	55	55	55	55	55	55	55	55
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>										
Beam Span (ft)	3	3	6	4	9	6	6	5	5	6
Beam Weight (plf)	5.55	5.55	5.55	5.55	5.55	8.33	5.55	5.55	5.55	5.55
<b>BEAM SIZING</b>										
Beam Depth (in)	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25
Beam Width/Weight	3	3	3	3	3	4.5	3	3	3	3
<b>UNIFORM LOADING</b>										
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	4	19	9	33	4	32	11	10	5	5
Wall Height (ft)	6	2	2	2	6	2	2	2	10	10
Total Uniform Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Live Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Uniform Roof Load (plf)	110	522.5	247.5	907.5	110	880	302.5	275	137.5	137.5
Total Live Roof Load (plf)	80	380	180	660	80	640	220	200	100	100
Total Uniform Wall Load (plf)	120	40	40	40	120	40	40	40	200	200
<b>PARTIALLY UNIFORM LOADING</b>										
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 Total 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
<b>POINT LOADS</b>										
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
<b>TAPERED LOADS</b>										
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
<b>REACTIONS &amp; MOMENT</b>										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	353	852	879	1906	1060	2785	1044	801	858	1029
Right Reaction (lb)	353	852	879	1906	1060	2785	1044	801	858	1029
Max Moment (lb-ft)	265	639	1319	1906	2385	4177	1566	1002	1072	1544
Max Shear (lb)	353	852	879	1906	1060	2785	1044	801	858	1029
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Area (in <sup>2</sup> )	27.75	27.75	27.75	27.75	27.75	41.63	27.75	27.75	27.75	27.75
Moment of Inertia I (in <sup>4</sup> )	198	198	198	198	198	297	198	198	198	198
Maximum Bending Stress (lb-ft)	74	179	370	535	669	781	439	281	301	433
Allowable Bending Stress (lb-ft)	990	990	990	990	990	1080	990	990	990	990
Allowable Moment (lb-ft)	3529	3529	3529	3529	3529	5775	3529	3529	3529	3529
<b>MOMENT FS</b>	13.32	5.52	2.68	1.85	1.48	1.38	2.25	3.52	3.29	2.29
Allowable Shear Stress (psi)	180	180	180	180	180	180	180	180	180	180
Maximum Shear Capacity (lb)	3330	3330	3330	3330	3330	4995	3330	3330	3330	3330
<b>SHEAR FS</b>	9.42	3.91	3.79	1.75	3.14	1.79	3.19	4.16	3.88	3.24
Bearing Required	0.19	0.45	0.47	1.02	0.57	0.99	0.56	0.43	0.46	0.55
Elastic Modulus (psi)	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
Live Load Deflection (in)	0.00	0.00	0.02	0.01	0.04	0.04	0.02	0.01	0.00	0.01
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.10	0.10	0.20	0.13	0.30	0.20	0.20	0.17	0.17	0.20
<b>LIVE LOAD DEFLECTION FS</b>	214.98	45.26	11.94	10.99	5.04	7.96	9.77	18.57	37.15	21.50
Total Load Deflection (in)	0.00	0.00	0.03	0.02	0.11	0.06	0.03	0.01	0.02	0.03
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.15	0.15	0.30	0.20	0.45	0.30	0.30	0.25	0.25	0.30
<b>TOTAL LOAD DEFLECTION FS</b>	109.52	45.42	11.00	11.42	4.06	5.21	9.27	17.38	16.24	9.40
<b>SELECTION</b>	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2
	(2) 2X10's	(2) 2X10's	(2) 2X10's	(2) 2X10's	(2) 2X10's	(3) 2X10's	(2) 2X10's	(2) 2X10's	(2) 2X10's	(2) 2X10's



Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	5 1/8" x 15" GLB	(2) 9 1/2" LVL	(2) 11 7/8" LVL	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 9 1/2" LVL	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 2X10's DF #2
	Moment: 1.22	Shear: 9.37	Shear: 2.44	Shear: 7.07	Moment: 1.66	Moment: 1.19	LL Deflection: L/668	Moment: 3.33	Moment: 1.63	Shear: 11.31
Controlling Load Case	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S
Name	RB-11	RB-12	RB-13	RB-14	RB-15	RB-16	RB-17	RB-18	RB-19	RB-20
Grade	GLB	LVL	LVL	DF #2	DF #2	DF #2	LVL	DF #2	DF #2	DF #2
<b>LOADING PARAMETERS</b>										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	52	52	52	52	52	52	52	52	52	52
Roof Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Roof Total Load (psf)	55	55	55	55	55	55	55	55	55	55
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>										
Beam Span (ft)	16	5	8	4	7	7	13	6	6	2.5
Beam Weight (plf)	18.67	9.64	12.06	5.55	5.55	5.55	9.64	5.55	5.55	5.55
<b>BEAM SIZING</b>										
Beam Depth (in)	15	9.5	11.88	9.25	9.25	9.25	9.5	9.25	9.25	9.25
Beam Width/Weight	5.125	3.5	3.5	3	3	3	3.5	3	3	3
<b>UNIFORM LOADING</b>										
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	21	8	29	4	11	11	9	4	10	4
Wall Height (ft)	2	2	0	6	2	2	0	6	10	6
Total Uniform Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Live Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Uniform Roof Load (plf)	577.5	220	797.5	110	302.5	302.5	247.5	110	275	110
Total Live Roof Load (plf)	40	160	580	80	220	220	180	80	200	80
Total Uniform Wall Load (plf)	40	40	0	120	40	40	0	120	200	120
<b>PARTIALLY UNIFORM LOADING</b>										
Partially Uniform Load 1	Roof	----	----	----	----	----	----	----	----	----
1 Span/Height (ft)	-13	0	0	0	0	0	0	0	0	0
1 Start Point (ft)	12	0	0	0	0	0	0	0	0	0
1 End Point (ft)	16	0	0	0	0	0	0	0	0	0
1 Total Partially Uniform Load (plf)	-357.5	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
<b>POINT LOADS</b>										
Point Load 1	Roof	----	----	----	----	Roof	----	----	----	----
1 Location (ft)	7	0	0	0	0	1	0	0	0	0
1 Total Load (lb)	3238	0	0	0	0	1671	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
<b>TAPERED LOADS</b>										
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
<b>REACTIONS &amp; MOMENT</b>										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	6732	674	3238	471	1218	2651	1671	707	1442	294
Right Reaction (lb)	5255	674	3238	471	1218	1457	1671	707	1442	294
Max Moment (lb-ft)	31601	843	6476	471	2132	2966	5432	1060	2162	184
Max Shear (lb)	6732	674	3238	471	1218	2651	1671	707	1442	294
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Area (in <sup>2</sup> )	76.88	33.25	41.58	27.75	27.75	27.75	33.25	27.75	27.75	27.75
Moment of Inertia I (in <sup>4</sup> )	1441	250	489	198	198	198	250	198	198	198
Maximum Bending Stress (lb-ft)	1973	192	944	132	598	832	1238	297	607	52
Allowable Bending Stress (lb-ft)	2400	2684	2604	990	990	990	2684	990	990	990
Allowable Moment (lb-ft)	38438	11775	17862	3529	3529	3529	11775	3529	3529	3529
<b>MOMENT FS</b>	<b>1.22</b>	<b>13.97</b>	<b>2.76</b>	<b>7.49</b>	<b>1.66</b>	<b>1.19</b>	<b>2.17</b>	<b>3.33</b>	<b>1.63</b>	<b>19.21</b>
Allowable Shear Stress (psi)	265	285	285	180	180	180	285	180	180	180
Maximum Shear Capacity (lb)	13581	6318	7900	3330	3330	3330	6318	3330	3330	3330
<b>SHEAR FS</b>	<b>2.02</b>	<b>9.37</b>	<b>2.44</b>	<b>7.07</b>	<b>2.73</b>	<b>1.26</b>	<b>3.78</b>	<b>4.71</b>	<b>2.31</b>	<b>11.31</b>
Bearing Required	2.02	0.26	1.23	0.25	0.65	1.41	0.64	0.38	0.77	0.16
Elastic Modulus (psi)	1,800,000	2,000,000	2,000,000	1,600,000	1,600,000	1,600,000	2,000,000	1,600,000	1,600,000	1,600,000
Live Load Deflection (in)	0.35	0.00	0.06	0.00	0.04	0.06	0.23	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)	0.53	0.17	0.27	0.13	0.23	0.23	0.43	0.20	0.20	0.08
<b>LIVE LOAD DEFLECTION FS</b>	<b>1.52</b>	<b>36.68</b>	<b>4.83</b>	<b>90.70</b>	<b>6.15</b>	<b>4.02</b>	<b>1.86</b>	<b>26.87</b>	<b>10.75</b>	<b>372.21</b>
Total Load Deflection (in)	0.52	0.01	0.08	0.00	0.06	0.09	0.33	0.02	0.04	0.00
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.80	0.25	0.40	0.20	0.35	0.35	0.65	0.30	0.30	0.13
<b>TOTAL LOAD DEFLECTION FS</b>	<b>1.55</b>	<b>32.65</b>	<b>5.19</b>	<b>46.20</b>	<b>5.83</b>	<b>4.00</b>	<b>1.95</b>	<b>13.69</b>	<b>6.71</b>	<b>189.62</b>
<b>SELECTION</b>										
GLB		LVL	LVL	DF #2	DF #2	DF #2	LVL	DF #2	DF #2	DF #2
	5 1/8" x 15"	(2) 9 1/2"	(2) 11 7/8"	(2) 2X10's	(2) 2X10's	(2) 2X10's	(2) 9 1/2"	(2) 2X10's	(2) 2X10's	(2) 2X10's

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	PASS (2) 2X10's DF #2	PASS (2) 2X10's DF #2	PASS (2) 14" LVL	PASS (3) 11 7/8" LVL	PASS (3) 11 7/8" LVL	PASS W12x35 Steel	PASS (2) 2X10's DF #2	PASS (3) 14" LVL	PASS (2) 9 1/2" LVL	PASS (2) 2X10's DF #2
	Moment: 1.25	Shear: 4.57	Shear: 1.3	LL Deflection: L/438	LL Deflection: L/438	TL Deflection: L/441	Moment: 1.67	Moment: 1.48	Moment: 1.23	Shear: 9.42
	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S
Name	RB-21	RB-22	RB-23	RB-24	RB-25	RB-26	RB-27	RB-28	RB-29	RB-30
Grade	DF #2	DF #2	LVL	LVL	LVL	Steel	DF #2	LVL	LVL	DF #2
<b>LOADING PARAMETERS</b>										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	52	52	52	52	52	52	52	52	52	52
Roof Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Roof Total Load (psf)	55	55	55	55	55	55	55	55	55	55
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>										
Beam Span (ft)	7.5	3	8.5	17	17	23	5	13	10	3
Beam Weight (plf)	5.55	5.55	14.21	18.09	18.09	35.00	5.55	21.32	9.64	5.55
<b>BEAM SIZING</b>										
Beam Depth (in)	9.25	9.25	14	11.88	11.88	12	9.25	14	9.5	9.25
Beam Width/Weight	3	3	3.5	5.25	5.25	35	3	5.25	3.5	3
<b>UNIFORM LOADING</b>										
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	10	16	10	18	18	0	23	20	26	4
Wall Height (ft)	6	2	2	0	0	2	2	0	2	6
Total Uniform Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Live Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Uniform Roof Load (plf)	275	440	275	495	495	0	632.5	550	715	110
Total Live Roof Load (plf)	200	320	200	360	360	0	460	400	520	80
Total Uniform Wall Load (plf)	120	40	40	0	0	40	40	0	40	120
<b>PARTIALLY UNIFORM LOADING</b>										
Partially Uniform Load 1										
1 Span/Height (ft)	0	0	0	0	0	Roof	28	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	20	0	0	0	0
1 Total Partially Uniform Load (plf)	0	0	0	0	0	770	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
<b>POINT LOADS</b>										
Point Load 1										
1 Location (ft)	0	0	Roof	2	0	0	0	Roof	4.5	0
1 Total Load (lb)	0	0	7558	0	0	0	0	4743.75	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
<b>TAPERED LOADS</b>										
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
<b>REACTIONS &amp; MOMENT</b>										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	1502	728	7179	4361	4361	9567	1695	6815	3823	353
Right Reaction (lb)	1502	728	3178	4361	4361	7558	1695	5356	3823	353
Max Moment (lb-ft)	2816	546	13321	18535	18535	54156	2119	24647	9558	265
Max Shear (lb)	1502	728	7179	4361	4361	9567	1695	6815	3823	353
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.10	1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.10
Area (in <sup>2</sup> )	27.75	27.75	49.00	62.37	62.37	—	27.75	73.50	33.25	27.75
Moment of Inertia I (in <sup>4</sup> )	198	198	800	734	734	285	198	1201	250	198
Maximum Bending Stress (lb-ft)	790	153	1398	1801	1801	13682	594	1725	2179	74
Allowable Bending Stress (lb-ft)	990	990	2546	2604	2604	213333	990	2546	2684	990
Allowable Moment (lb-ft)	3529	3529	24258	26793	26793	127745	3529	36387	11775	3529
<b>MOMENT FS</b>										
Allowable Shear Stress (psi)	180	180	285	285	285	—	180	285	285	180
Maximum Shear Capacity (lb)	3330	3330	9310	11850	11850	67500	3330	13965	6318	3330
<b>SHEAR FS</b>										
Bearing Required	0.80	0.39	2.73	1.11	1.11	—	0.80	1.73	1.46	0.19
Elastic Modulus (psi)	1,600,000	1,600,000	2,000,000	2,000,000	2,000,000	29,000,000	1,600,000	2,000,000	2,000,000	1,600,000
Live Load Deflection (in)	0.05	0.00	0.07	0.47	0.47	0.41	0.02	0.21	0.24	0.00
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.25	0.10	0.28	0.57	0.57	0.77	0.17	0.43	0.33	0.10
<b>LIVE LOAD DEFLECTION FS</b>										
Total Load Deflection (in)	0.09	0.00	0.09	0.66	0.66	0.63	0.03	0.29	0.35	0.00
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.38	0.15	0.43	0.85	0.85	1.15	0.25	0.65	0.50	0.15
<b>TOTAL LOAD DEFLECTION FS</b>										
DF #2	4.12	53.13	4.81	1.28	1.28	1.84	8.22	2.22	1.44	109.52
SELECTION	(2) 2X10's	(2) 2X10's	(2) 14"	(3) 11 7/8"	(3) 11 7/8"	W12x35	(2) 2X10's	(3) 14"	(2) 9 1/2"	(2) 2X10's

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	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 2X10's DF #2	(3) 2X10's DF #2	(2) 2X10's DF #2	(2) 18" LVL	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 2X10's DF #2
	Moment: 2.85	Moment: 1.6	Shear: 1.8	Moment: 1.15	Moment: 1.02	Moment: 1.19	Shear: 9.42	Shear: 6.93	Moment: 3.52	Shear: 2.33
	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S
Name	RB-31	RB-32	RB-33	RB-34	RB-35	RB-36	RB-37	RB-38	RB-39	RB-40
Grade	DF #2	DF #2	DF #2	DF #2	DF #2	LVL	DF #2	DF #2	DF #2	DF #2
<b>LOADING PARAMETERS</b>										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	52	52	52	52	52	52	52	52	52	52
Roof Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Roof Total Load (psf)	55	55	55	55	55	55	55	55	55	55
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>										
Beam Span (ft)	6	8	4	12	10	18	3	3	5	3
Beam Weight (plf)	5.55	5.55	5.55	8.33	5.55	18.27	5.55	5.55	5.55	5.55
<b>BEAM SIZING</b>										
Beam Depth (in)	9.25	9.25	9.25	9.25	9.25	18	9.25	9.25	9.25	9.25
Beam Width/Weight	3	3	3	4.5	3	3.5	3	3	3	3
<b>UNIFORM LOADING</b>										
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	4	4	32	4	4	27	4	10	10	33
Wall Height (ft)	8	8	2	8	8	2	6	2	2	2
Total Uniform Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Live Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Uniform Roof Load (plf)	110	110	880	110	110	742.5	110	275	275	907.5
Total Live Roof Load (plf)	80	80	640	80	80	540	80	200	200	660
Total Uniform Wall Load (plf)	160	160	40	160	160	40	120	40	40	40
<b>PARTIALLY UNIFORM LOADING</b>										
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 Total 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
<b>POINT LOADS</b>										
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
<b>TAPERED LOADS</b>										
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
<b>REACTIONS &amp; MOMENT</b>										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	827	1102	1851	1670	1378	7207	353	481	801	1430
Right Reaction (lb)	827	1102	1851	1670	1378	7207	353	481	801	1430
Max Moment (lb-ft)	1240	2204	1851	5010	3444	32431	265	361	1002	1072
Max Shear (lb)	827	1102	1851	1670	1378	7207	353	481	801	1430
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.10	1.10	1.10	1.20	1.10	1.10	1.10	1.10	1.10	1.10
Area (in <sup>2</sup> )	27.75	27.75	27.75	41.63	27.75	63.00	27.75	27.75	27.75	27.75
Moment of Inertia I (in <sup>4</sup> )	198	198	198	297	198	1701	198	198	198	198
Maximum Bending Stress (lb-ft)	348	618	519	937	966	2059	74	101	281	301
Allowable Bending Stress (lb-ft)	990	990	990	1080	990	2461	990	990	990	990
Allowable Moment (lb-ft)	3529	3529	3529	5775	3529	38753	3529	3529	3529	3529
<b>MOMENT FS</b>										
Allowable Shear Stress (psi)	180	180	180	180	180	285	180	180	180	180
Maximum Shear Capacity (lb)	3330	3330	3330	4995	3330	11970	3330	3330	3330	3330
<b>SHEAR FS</b>										
Bearing Required	0.44	0.59	0.99	0.59	0.73	2.75	0.19	0.26	0.43	0.76
Elastic Modulus (psi)	1,600,000	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
Live Load Deflection (in)	0.01	0.02	0.01	0.08	0.06	0.38	0.00	0.00	0.01	0.00
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.20	0.27	0.13	0.40	0.33	0.60	0.10	0.10	0.17	0.10
<b>LIVE LOAD DEFLECTION FS</b>										
Total Load Deflection (in)	26.87	11.34	11.34	5.04	5.80	1.58	214.98	85.99	18.57	26.06
Total Load Deflection Limit	0.03	0.08	0.02	0.28	0.20	0.56	0.00	0.00	0.01	0.01
Allowable Total Load Deflection (in)	240	240	240	240	240	240	240	240	240	240
TOTAL LOAD DEFLECTION FS	11.70	4.94	11.76	2.17	2.53	1.60	109.52	80.48	17.38	27.07
<b>SELECTION</b>										
DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	LVL	DF #2	DF #2	DF #2	DF #2
(2) 2X10's	(2) 2X10's	(2) 2X10's	(3) 2X10's	(2) 2X10's	(2) 2X10's	(2) 18"	(2) 2X10's	(2) 2X10's	(2) 2X10's	(2) 2X10's

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	PASS (2) 9 1/2" LVL Moment: 1.32	PASS (2) 2X10's DF #2 Moment: 2.47	PASS (2) 2X10's DF #2 Moment: 4.79	PASS (2) 11 7/8" LVL Moment: 1.68
Controlling Load Case	DL+S	DL+S	DL+S	DL+S
Name	RB-41	RB-42	RB-43	RB-44
Grade	LVL	DF #2	DF #2	LVL
<b>LOADING PARAMETERS</b>				
Floor Live Load (psf)	40	40	40	40
Floor Total Load (psf)	52	52	52	52
Roof Live Load (psf)	40	40	40	40
Roof Total Load (psf)	55	55	55	55
Wall Load (psf)	20	20	20	20
<b>BEAM SPECIFICATIONS</b>				
Beam Span (ft)	6	5	5	12
Beam Weight (plf)	9.64	5.55	5.55	12.06
<b>BEAM SIZING</b>				
Beam Depth (in)	9.5	9.25	9.25	11.88
Beam Width/Weight	3.5	3	3	3.5
<b>UNIFORM LOADING</b>				
Floor Span (ft)	0	0	0	0
Roof Span (ft)	33	15	4	21
Wall Height (ft)	2	2	6	0
Total Uniform Floor Load (plf)	0	0	0	0
Total Live Floor Load (plf)	0	0	0	0
Total Uniform Roof Load (plf)	907.5	412.5	110	577.5
Total Live Roof Load (plf)	660	300	80	420
Total Uniform Wall Load (plf)	40	40	120	0
<b>PARTIALLY UNIFORM LOADING</b>				
Partially Uniform Load 1				
1 Span/Height (ft)	0	0	0	0
1 Start Point (ft)	0	0	0	0
1 End Point (ft)	0	0	0	0
1 Total Partially Uniform Load (plf)	0	0	0	0
Partially Uniform Load 2				
2 Span/Height (ft)	0	0	0	0
2 Start Point (ft)	0	0	0	0
2 End Point (ft)	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0
Partially Uniform Load 3				
3 Span/Height (ft)	0	0	0	0
3 Start Point (ft)	0	0	0	0
3 End Point (ft)	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0
<b>POINT LOADS</b>				
Point Load 1				
1 Location (ft)	Roof 3	---	---	---
1 Total Load (lb)	3162.5	0	0	0
Point Load 2				
2 Location (ft)	0	0	0	0
2 Total Load (lb)	0	0	0	0
Point Load 3				
3 Location (ft)	0	0	0	0
3 Total Load (lb)	0	0	0	0
<b>TAPERED LOADS</b>				
Tapered Load Starting Point (ft)	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0
Tapered Load at End (plf)	0	0	0	0
<b>REACTIONS &amp; MOMENT</b>				
Duration Increase	1	1	1	1
Left Reaction (lb)	4453	1145	589	3537
Right Reaction (lb)	4453	1145	589	3537
Max Moment (lb-ft)	8893	1431	736	10612
Max Shear (lb)	4453	1145	589	3537
C <sub>v</sub>	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.00	1.10	1.10	1.00
Area (in <sup>2</sup> )	33.25	27.75	27.75	41.58
Moment of Inertia I (in <sup>4</sup> )	250	198	198	489
Maximum Bending Stress (lb-ft)	2027	402	206	1547
Allowable Bending Stress (lb-ft)	2684	990	990	2604
Allowable Moment (lb-ft)	11775	3529	3529	17862
<b>MOMENT FS</b>				
Allowable Shear Stress (psi)	285	180	180	285
Maximum Shear Capacity (lb)	6318	3330	3330	7900
<b>SHEAR FS</b>				
Bearing Required	1.70	0.61	0.31	1.35
Elastic Modulus (psi)	2,000,000	1,600,000	1,600,000	2,000,000
Live Load Deflection (in)	0.07	0.01	0.00	0.20
Live Load Deflection Limit	360	360	360	360
Allowable Live Load Deflection (in)	0.20	0.17	0.17	0.40
<b>LIVE LOAD DEFLECTION FS</b>				
Total Load Deflection (in)	0.11	0.02	0.01	0.28
Total Load Deflection Limit	240	240	240	240
Allowable Total Load Deflection (in)	0.30	0.25	0.25	0.60
<b>TOTAL LOAD DEFLECTION FS</b>				
	2.83	12.17	23.66	2.11
<b>SELECTION</b>				
	LVL	DF #2	DF #2	LVL
	(2) 9 1/2"	(2) 2X10's	(2) 2X10's	(2) 11 7/8"

Plan: DAVIES  
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	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 11 7/8" LVL	(1) 11 7/8" LVL	(2) 2X10's DF #2	W10x49 Steel	(2) 11 7/8" LVL	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 2X10's DF #2
	Shear: 2.38	Moment: 1.65	Moment: 2.52	Shear: 8.98	Moment: 1.82	LL Deflection: L/385 DL+0.75LL+0.75S	Moment: 1.25	Shear: 3.26	Moment: 1.27	Moment: 3.65
	DL+LL	DL+LL	DL+LL	DL+LL	DL+LL		DL+LL	DL+LL	DL+LL	DL+LL
Name	MFB-1	MFB-2	MFB-3	MFB-4	MFB-5	MFB-6	MFB-7	MFB-8	MFB-9	MFB-10
Grade	DF #2	DF #2	LVL	LVL	DF #2	Steel	LVL	DF #2	DF #2	DF #2
<b>LOADING PARAMETERS</b>										
Floor Live Load (psf)	40	40	40	40	40	35	40	40	40	40
Floor Total Load (psf)	52	52	52	52	52	47	52	52	52	52
Roof Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Roof Total Load (psf)	55	55	55	55	55	55	55	55	55	55
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>										
Beam Span (ft)	3	5.33	11.5	8	5	20	12	3	3	5
Beam Weight (plf)	5.55	5.55	12.06	6.03	5.55	49.00	12.06	5.55	5.55	5.55
<b>BEAM SIZING</b>										
Beam Depth (in)	9.25	9.25	11.88	11.88	9.25	10	11.88	9.25	9.25	9.25
Beam Width/Weight	3	3	3.5	1.75	3	49	3.5	3	3	3
<b>UNIFORM LOADING</b>										
Floor Span (ft)	28	23	16	4	16	21	30	26	20	4
Roof Span (ft)	0	0	0	0	0	0	0	0	0	0
Wall Height (ft)	10	0	0	0	10	0	0	0	0	10
Total Uniform Floor Load (plf)	728	598	416	104	416	401.625	780	676	520	104
Total Live Floor Load (plf)	560	460	320	80	320	275.625	600	520	400	80
Total Uniform Roof Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Live Roof Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Uniform Wall Load (plf)	200	0	0	0	200	0	0	0	0	200
<b>PARTIALLY UNIFORM LOADING</b>										
Partially Uniform Load 1	----	----	----	----	----	Floor	----	----	----	----
1 Span/Height (ft)	0	0	0	0	0	11	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	20	0	0	0	0
1 Total Partially Uniform Load (plf)	0	0	0	0	0	210.375	0	0	0	0
Partially Uniform Load 2	----	----	----	----	----	Roof	----	----	----	----
2 Span/Height (ft)	0	0	0	0	0	30	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	6	0	0	0	0
2 End Point (ft)	0	0	0	0	0	20	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	675	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
<b>POINT LOADS</b>										
Point Load 1	----	----	----	----	----	Roof	----	----	Floor	----
1 Location (ft)	0	0	0	0	0	6	0	0	1.5	0
1 Total Load (lb)	0	0	0	0	0	9567	0	0	3120	0
Point Load 2	----	----	----	----	----	Floor	----	----	----	----
2 Location (ft)	0	0	0	0	0	15	0	0	0	0
2 Total Load (lb)	0	0	0	0	0	3108	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
<b>TAPERED LOADS</b>										
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
<b>REACTIONS &amp; MOMENT</b>										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	1400	1608	2461	440	1554	17391	4752	1022	2349	774
Right Reaction (lb)	1400	1608	2461	440	1554	17953	4752	1022	2349	774
Max Moment (lb-ft)	1050	2143	7076	880	1942	98499	14257	767	2776	967
Max Shear (lb)	1400	1608	2461	440	1554	17953	4752	1022	2349	774
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.10	1.10	1.00	1.00	1.10	1.00	1.10	1.10	1.10	1.10
Area (in <sup>2</sup> )	27.75	27.75	41.58	20.79	27.75	---	41.58	27.75	27.75	27.75
Moment of Inertia I (in <sup>4</sup> )	198	198	489	245	198	272	489	198	198	198
Maximum Bending Stress (lb-ft)	295	601	1031	257	545	21728	2078	215	779	271
Allowable Bending Stress (lb-ft)	990	990	2604	2604	990	251667	2604	990	990	990
Allowable Moment (lb-ft)	3529	3529	17862	8931	3529	150699	17862	3529	3529	3529
<b>MOMENT FS</b>	<b>3.36</b>	<b>1.65</b>	<b>2.52</b>	<b>10.15</b>	<b>1.82</b>	<b>1.53</b>	<b>1.25</b>	<b>4.60</b>	<b>1.27</b>	<b>3.65</b>
Allowable Shear Stress (psi)	180	180	285	285	180	---	285	180	180	180
Maximum Shear Capacity (lb)	3330	3330	7900	3950	3330	93750	7900	3330	3330	3330
<b>SHEAR FS</b>	<b>2.38</b>	<b>2.07</b>	<b>3.21</b>	<b>8.98</b>	<b>2.14</b>	<b>5.22</b>	<b>1.66</b>	<b>3.26</b>	<b>1.42</b>	<b>4.30</b>
Bearing Required	0.75	0.86	0.94	0.34	0.83	---	1.81	0.55	1.25	0.41
Elastic Modulus (psi)	1,600,000	1,600,000	2,000,000	2,000,000	1,600,000	29,000,000	2,000,000	1,600,000	1,600,000	1,600,000
Live Load Deflection (in)	0.00	0.03	0.13	0.02	0.01	0.62	0.29	0.00	0.01	0.00
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.10	0.18	0.38	0.27	0.17	0.67	0.40	0.10	0.10	0.17
<b>LIVE LOAD DEFLECTION FS</b>	<b>30.71</b>	<b>6.67</b>	<b>2.95</b>	<b>17.51</b>	<b>11.61</b>	<b>1.07</b>	<b>1.38</b>	<b>33.07</b>	<b>10.24</b>	<b>46.44</b>
Total Load Deflection (in)	0.01	0.03	0.17	0.02	0.03	0.91	0.38	0.00	0.01	0.01
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.15	0.27	0.58	0.40	0.25	1.00	0.60	0.15	0.15	0.25
<b>TOTAL LOAD DEFLECTION FS</b>	<b>27.63</b>	<b>7.62</b>	<b>3.31</b>	<b>19.10</b>	<b>8.97</b>	<b>1.09</b>	<b>1.57</b>	<b>37.85</b>	<b>11.78</b>	<b>18.00</b>
<b>SELECTION</b>										
DF #2	DF #2	DF #2	LVL	LVL	DF #2	Steel	LVL	DF #2	DF #2	DF #2
(2) 2X10's	(2) 2X10's	(2) 11 7/8"	(1) 11 7/8"	(2) 2X10's	W10x49	(2) 11 7/8"	(2) 2X10's	(2) 2X10's	(2) 2X10's	(2) 2X10's

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	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	(2) 2X10's DF #2	(2) 2X10's DF #2	(2) 11 7/8" LVL	(2) 11 7/8" LVL	(2) 11 7/8" LVL	(2) 11 7/8" LVL	W10x22 Steel	(2) 11 7/8" LVL	(3) 11 7/8" LVL	(2) 11 7/8" LVL
	Moment: 2.49	Moment: 1.82	Shear: 2.64	Shear: 3.99	Moment: 1.76	Moment: 1.6	LL Deflection: L/875	Shear: 4.15	Moment: 1.28	TL Deflection: L/795
	DL+S	DL+LL	DL+S	DL+LL	DL+S	DL+S	DL+LL	DL+LL	DL+LL	DL+LL
	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2	DF #2
Controlling Load Case										
Name	MFB-11	MFB-12	MFB-13	MFB-14	MFB-15	MFB-16	MFB-17	MFB-18	MFB-19	MFB-20
Grade							Steel			
<b>LOADING PARAMETERS</b>										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	52	52	52	52	52	52	52	52	52	52
Roof Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Roof Total Load (psf)	55	55	55	55	55	55	55	55	55	55
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>										
Beam Span (ft)	6	5	6.5	5	13	12	16	5	12	20
Beam Weight (plf)	5.55	5.55	12.06	12.06	12.06	12.06	22.00	12.06	18.09	12.06
<b>BEAM SIZING</b>										
Beam Depth (in)	9.25	9.25	11.88	11.88	11.88	11.88	10	11.88	11.88	11.88
Beam Width/Weight	3	3	3.5	3.5	3.5	3.5	22	3.5	5.25	3.5
<b>UNIFORM LOADING</b>										
Floor Span (ft)	0	16	23	30	18	4	2.66	20	20	2.66
Roof Span (ft)	4	0	10	0	0	14	0	4	4	0
Wall Height (ft)	10	10	10	0	0	10	0	10	10	0
Total Uniform Floor Load (plf)	0	416	483	780	468	24	69.16	520	520	69.16
Total Live Floor Load (plf)	0	320	345	600	360	0	53.2	400	400	53.2
Total Uniform Roof Load (plf)	110	0	225	0	0	385	0	30	30	0
Total Live Roof Load (plf)	80	0	150	0	0	280	0	0	0	0
Total Uniform Wall Load (plf)	200	200	200	0	0	200	0	200	200	0
<b>PARTIALLY UNIFORM LOADING</b>										
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 Total 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
<b>POINT LOADS</b>										
Point Load 1	----	----	----	----	----	----	Floor	----	Roof	----
1 Location (ft)	0	0	0	0	0	0	4	0	2.5	0
1 Total Load (lb)	0	0	0	0	0	0	5703	0	5255	0
Point Load 2	----	----	----	----	----	----	Floor	----	----	----
2 Location (ft)	0	0	0	0	0	0	8	0	0	0
2 Total Load (lb)	0	0	0	0	0	0	1905	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
<b>TAPERED LOADS</b>										
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
<b>REACTIONS &amp; MOMENT</b>										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	947	1554	2990	1980	3120	3726	5959	1905	8769	812
Right Reaction (lb)	947	1554	2990	1980	3120	3726	3108	1905	5703	812
Max Moment (lb-ft)	1420	1942	4858	2475	10141	11179	22623	2381	20911	4061
Max Shear (lb)	947	1554	2990	1980	3120	3726	5959	1905	8769	812
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.10	1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Area (in <sup>2</sup> )	27.75	27.75	41.58	41.58	41.58	41.58	---	41.58	62.37	41.58
Moment of Inertia I (in <sup>4</sup> )	198	198	489	489	489	489	118	489	734	489
Maximum Bending Stress (lb-ft)	398	545	708	361	1478	1629	11605	347	2032	592
Allowable Bending Stress (lb-ft)	990	990	2604	2604	2604	2604	108333	2604	2604	2604
Allowable Moment (lb-ft)	3529	3529	17862	17862	17862	17862	64870	17862	26793	17862
<b>MOMENT FS</b>	<b>2.49</b>	<b>1.82</b>	<b>3.68</b>	<b>7.22</b>	<b>1.76</b>	<b>1.60</b>	<b>2.84</b>	<b>7.50</b>	<b>1.28</b>	<b>4.40</b>
Allowable Shear Stress (psi)	180	180	285	285	285	285	---	285	285	285
Maximum Shear Capacity (lb)	3330	3330	7900	7900	7900	7900	75000	7900	11850	7900
<b>SHEAR FS</b>	<b>3.52</b>	<b>2.14</b>	<b>2.64</b>	<b>3.99</b>	<b>2.63</b>	<b>2.12</b>	<b>12.59</b>	<b>4.15</b>	<b>1.35</b>	<b>9.73</b>
Bearing Required	0.50	0.83	1.14	0.75	1.19	1.42	---	0.73	2.23	0.31
Elastic Modulus (psi)	1,600,000	1,600,000	2,000,000	2,000,000	2,000,000	2,000,000	29,000,000	2,000,000	2,000,000	2,000,000
Live Load Deflection (in)	0.01	0.01	0.02	0.01	0.24	0.13	0.22	0.01	0.23	0.20
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.20	0.17	0.22	0.17	0.43	0.40	0.53	0.17	0.40	0.67
<b>LIVE LOAD DEFLECTION FS</b>	<b>26.87</b>	<b>11.61</b>	<b>10.56</b>	<b>19.13</b>	<b>1.81</b>	<b>2.97</b>	<b>2.43</b>	<b>28.69</b>	<b>1.77</b>	<b>3.37</b>
Total Load Deflection (in)	0.03	0.03	0.04	0.01	0.32	0.30	0.29	0.01	0.38	0.30
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.30	0.25	0.33	0.25	0.65	0.60	0.80	0.25	0.60	1.00
<b>TOTAL LOAD DEFLECTION FS</b>	<b>10.22</b>	<b>8.97</b>	<b>8.52</b>	<b>21.74</b>	<b>2.04</b>	<b>2.01</b>	<b>2.71</b>	<b>22.59</b>	<b>1.58</b>	<b>3.31</b>
<b>SELECTION</b>										
DF #2	DF #2	DF #2	LVL	LVL	LVL	LVL	Steel	LVL	LVL	LVL
	(2) 2X10's	(2) 2X10's	(2) 11 7/8"	(2) 11 7/8"	(2) 11 7/8"	(2) 11 7/8"	W10x22	(2) 11 7/8"	(3) 11 7/8"	(2) 11 7/8"

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

	PASS	PASS	PASS	PASS	PASS
	<b>6x6 POST</b> FS: 2.09	<b>4x6 POST</b> FS: 1.27	<b>(4) 2x4</b> FS: 1.11	<b>(3) 2x4</b> FS: 1.35	<b>4x6 POST</b> FS: 1.08
<b>Location:</b>	<b>DECK</b> RB 25/44	<b>RB-28</b> ---	<b>RB-36</b> ---	<b>RB-41</b> ---	<b>MFB-6</b> ---
<b>COLUMN DIMENSIONS:</b>					
Total Column Length (ft):	10	10	10	10	10
X-Unbraced Length (ft):	10	10	10	10	10
Y-Unbraced Length (ft):	10	0	0	0	0
<b>MATERIAL SPECS:</b>					
Material:	Doug Fir #2	Doug Fir #2	Doug Fir #2	Doug Fir #2	Doug Fir #2
Depth-x (in):	5.5	5.5	3.5	3.5	5.5
Width-y (in):	5.5	3.5	1.5	1.5	3.5
# Members	1	1	4	3	1
Area (in <sup>2</sup> ):	30.25	19.25	21.00	15.75	19.25
Axial Load:	7,899	12,231	7,207	4,453	14,363
<b>MATERIAL PROPERTIES:</b>					
F <sub>c</sub>	700	1,350	1,350	1,350	1,350
E	1,300,000	1,600,000	1,600,000	1,600,000	1,600,000
E <sub>min</sub>	470,000	580,000	580,000	580,000	580,000
Lex/dx	21.82	21.82	34.29	34.29	21.82
Ley/dy	21.82	0.00	0.00	0.00	0.00
<b>FACTORS:</b>					
Cd	1	1	1	1	1
Cf	1.1	1.1	1.15	1.15	1.1
Ke	1	1	1	1	1
F <sub>c</sub> *	770	1,485	1,553	1,553	1,485
F <sub>ce</sub>	812	1,002	406	406	1,002
Cp	0.71	0.54	0.25	0.25	0.54
F' <sub>c</sub>	546	808	381	381	808
<b>Allowable Load (lbs)</b>	<b>16,511</b>	<b>15,561</b>	<b>7,997</b>	<b>5,998</b>	<b>15,561</b>
<b>Location:</b>	---	---	---	---	---
<b>COLUMN DIMENSIONS:</b>					
Total Column Length (ft):	10	10	10	10	10
X-Unbraced Length (ft):	10	10	10	10	10
Y-Unbraced Length (ft):	0	0	0	0	0
<b>MATERIAL SPECS:</b>					
Material:	Doug Fir #2	Doug Fir #2	Doug Fir #2	Doug Fir #2	Doug Fir #2
Depth-x (in):	5.5	5.5	5.5	5.5	5.5
Width-y (in):	1.5	1.5	1.5	1.5	1.5
# Members	2	2	2	2	2
Area (in <sup>2</sup> ):	16.50	16.50	16.50	16.50	16.50
Axial Load:	10	10	10	10	10
<b>MATERIAL PROPERTIES:</b>					
F <sub>c</sub>	1,350	1,350	1,350	1,350	1,350
E	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
E <sub>min</sub>	580,000	580,000	580,000	580,000	580,000
Lex/dx	21.82	21.82	21.82	21.82	21.82
Ley/dy	0.00	0.00	0.00	0.00	0.00
<b>FACTORS:</b>					
Cd	1	1	1	1	1
Cf	1.1	1.1	1.1	1.1	1.1
Ke	1	1	1	1	1
F <sub>c</sub> *	1,485	1,485	1,485	1,485	1,485
F <sub>ce</sub>	1,002	1,002	1,002	1,002	1,002
Cp	0.54	0.54	0.54	0.54	0.54
F' <sub>c</sub>	808	808	808	808	808
<b>Allowable Load (lbs)</b>	<b>13,338</b>	<b>13,338</b>	<b>13,338</b>	<b>13,338</b>	<b>13,338</b>

Plan: DAVIES  
 Date: 5/8/2019  
 Location: Parcel C-876 East Rosefield Lane, Draper

	PASS	PASS	PASS	PASS	
	FS: 1.26	FS: 1.05	FS: 3.1	FS: 1.71	
<b>INPUT</b>					
Location:	MFB-7	MFB-6	RB-24	RB-25 AND 44	---
Callout	S-48	S-48	S-36	S-36	S-24
Column Width (in)	3.5	3.5	3.5	3.5	3.5
Load (lb)	19,101	22,953	4,361	7,899	10
<b>SPECS</b>					
Soil Bearing Pressure (psf)	1500	1500	1500	1500	1500
Footing Width/Diameter (in)	48	48	36	36	24
Footing Length/Diameter (in)	48	48	36	36	24
Footing Depth (in)	12	12	10	10	10
<b>CALCULATIONS</b>					
Area Required (ft <sup>2</sup> )	12.73	15.30	2.91	5.27	0.01
Area Provided (ft <sup>2</sup> )	16.00	16.00	9.00	9.00	4.00
<b>FLEXURE</b>					
M <sub>u</sub> (lb-ft/ft)	3059.51	3676.58	662.42	1199.70	1.36
ΦM <sub>n</sub> (lb-ft/ft)	8950.37	8950.37	5988.56	5988.56	6700.37
<b>ONE WAY SHEAR</b>					
V <sub>u</sub> (kip)	2.08	2.50	0.60	1.09	0.00
ΦV <sub>c</sub> (kip)	8.13	8.13	6.16	6.16	6.16
<b>PUNCHING SHEAR</b>					
V <sub>u</sub> (kip)	26.8	32.2	6.0	10.9	0.0
ΦV <sub>c</sub> (kip)	63.7	63.7	40.1	40.1	40.1
<b>SELECTION</b>	<b>S-48</b>	<b>S-48</b>	<b>S-36</b>	<b>S-36</b>	<b>S-24</b>
	48" Square by 12" Deep Concrete Footing with (6) #4 Bars Each Way	48" Square by 12" Deep Concrete Footing with (6) #4 Bars Each Way	36" Square by 10" Deep Concrete Footing with (4) #4 Bars Each Way	36" Square by 10" Deep Concrete Footing with (4) #4 Bars Each Way	24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way

<b>INPUT</b>					
Location:	---	---	---	---	---
Callout	S-24	S-24	S-24	S-24	S-24
Column Width (in)	3.5	3.5	3.5	3.5	3.5
Load (lb)	10	10	10	10	10
<b>SPECS</b>					
Soil Bearing Pressure (psf)	1500	1500	1500	1500	1500
Footing Width/Diameter (in)	24	24	24	24	24
Footing Length/Diameter (in)	24	24	24	24	24
Footing Depth (in)	10	10	10	10	10
<b>CALCULATIONS</b>					
Area Required (ft <sup>2</sup> )	0.01	0.01	0.01	0.01	0.01
Area Provided (ft <sup>2</sup> )	4.00	4.00	4.00	4.00	4.00
<b>FLEXURE</b>					
M <sub>u</sub> (lb-ft/ft)	1.36	1.36	1.36	1.36	1.36
ΦM <sub>n</sub> (lb-ft/ft)	6700.37	6700.37	6700.37	6700.37	6700.37
<b>ONE WAY SHEAR</b>					
V <sub>u</sub> (kip)	0.00	0.00	0.00	0.00	0.00
ΦV <sub>c</sub> (kip)	6.16	6.16	6.16	6.16	6.16
<b>PUNCHING SHEAR</b>					
V <sub>u</sub> (kip)	0.0	0.0	0.0	0.0	0.0
ΦV <sub>c</sub> (kip)	40.1	40.1	40.1	40.1	40.1
<b>SELECTION</b>	<b>S-24</b>	<b>S-24</b>	<b>S-24</b>	<b>S-24</b>	<b>S-24</b>
	24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way	24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way	24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way	24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way	24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way