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December 15, 2025

City Of Pinecrest Building Department
Pinecrest, Florida

Re: Bhagwansing Residence Calculations
8100 SW 120th Street
Pinecrest, Fl

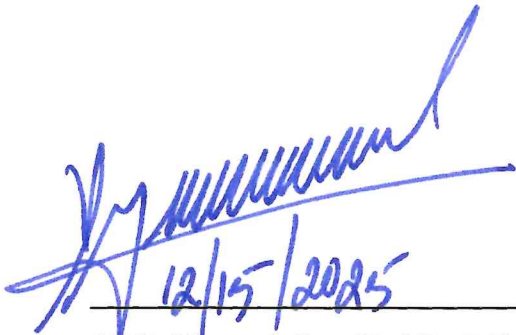
Dear Sir/Madam:

Please find the attached calculations for the above-mentioned project.

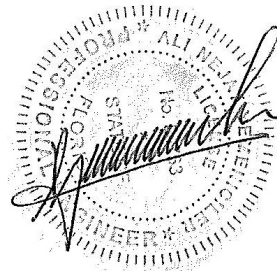
- | | |
|--|-------------|
| • Wind load calculations | 1-10&1a-10a |
| • Roof Truss Up-lift calculations | 11-12 |
| • Concrete Beam & Lintel Calculations | 13-53a |
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If you have any questions, please do not hesitate to call.

Best Regards,



Ali N. Yemeniciler, MsCE., P.E
FL. Reg # 54733



Ali
Yemeniciler
r

Digitally signed by
Ali Yemeniciler
Date: 2025.12.15
11:18:00 -05'00'

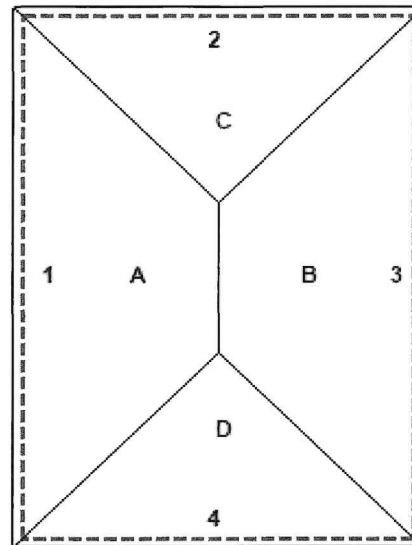
"The Pressure's On Us."

Bhagwansingh family residence

Title

December 09, 2025

Address: 8100 SW 120th Street, Pinecrest FL 33156

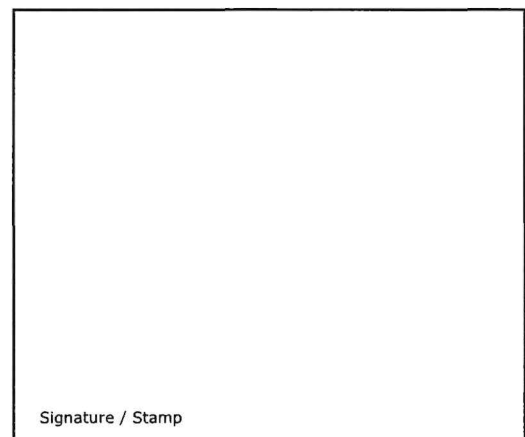


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These calculations are based on the ASCE 7-98, ASCE 7-02, ASCE 7-05, ASCE 7-10, and ASCE 7-16 Standard Practices for determining the minimum wind loads, and intended performance goals, for buildings, other structures and their nonstructural components that are subject to building code requirements. While the information presented by this program is believed to be correct, SDG, Inc. neither intends for this program to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such a professional in interpreting and applying the results of the report provided by the WLS 2019 program.

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Signature / Stamp

A

Site Information

Wind Dir.	Exposure
1	C
2	C
3	C
4	C

Basic Wind Speed: 175 mph
Topography: Flat

Optional Factors

This project uses load combinations from ASCE 7.

Structure Information

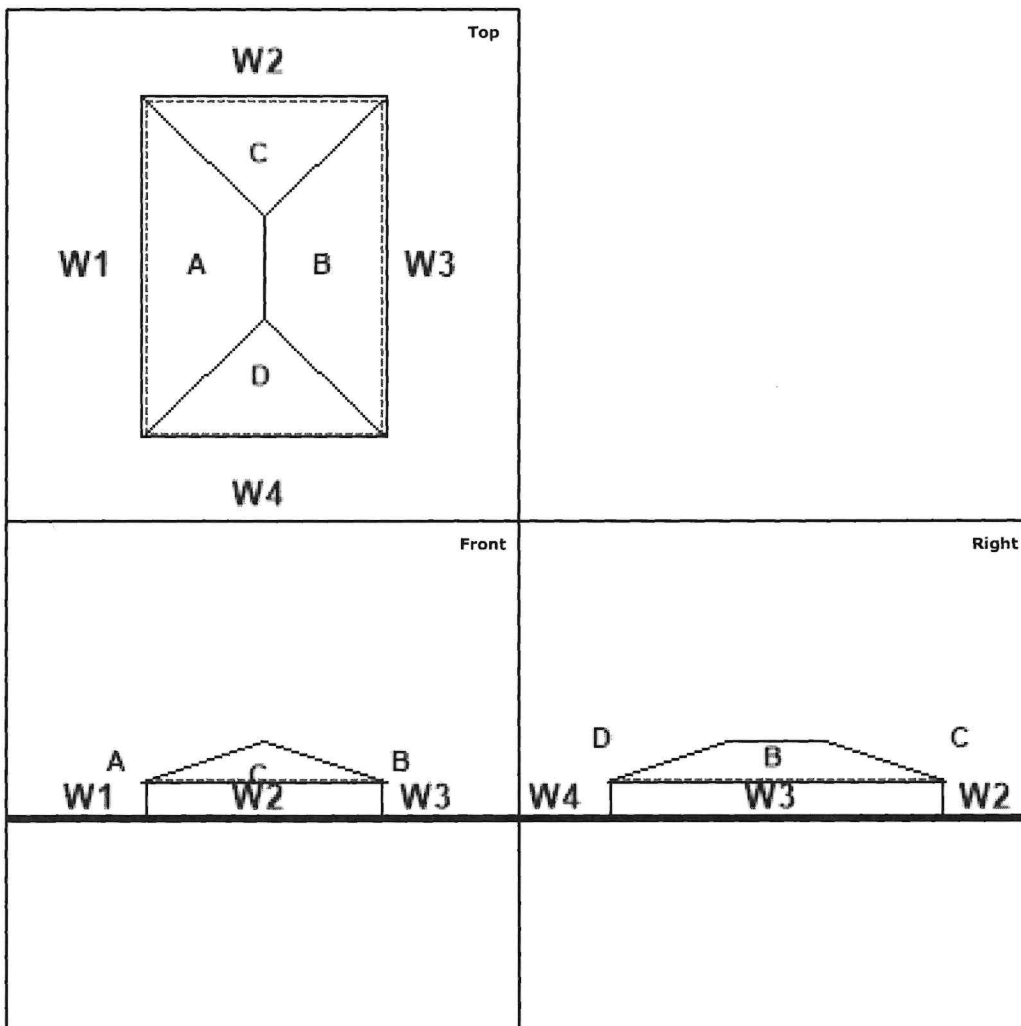
Structure Type: Building
 Structure Category: II
 Enclosure Classification: Enclosed

Main Section

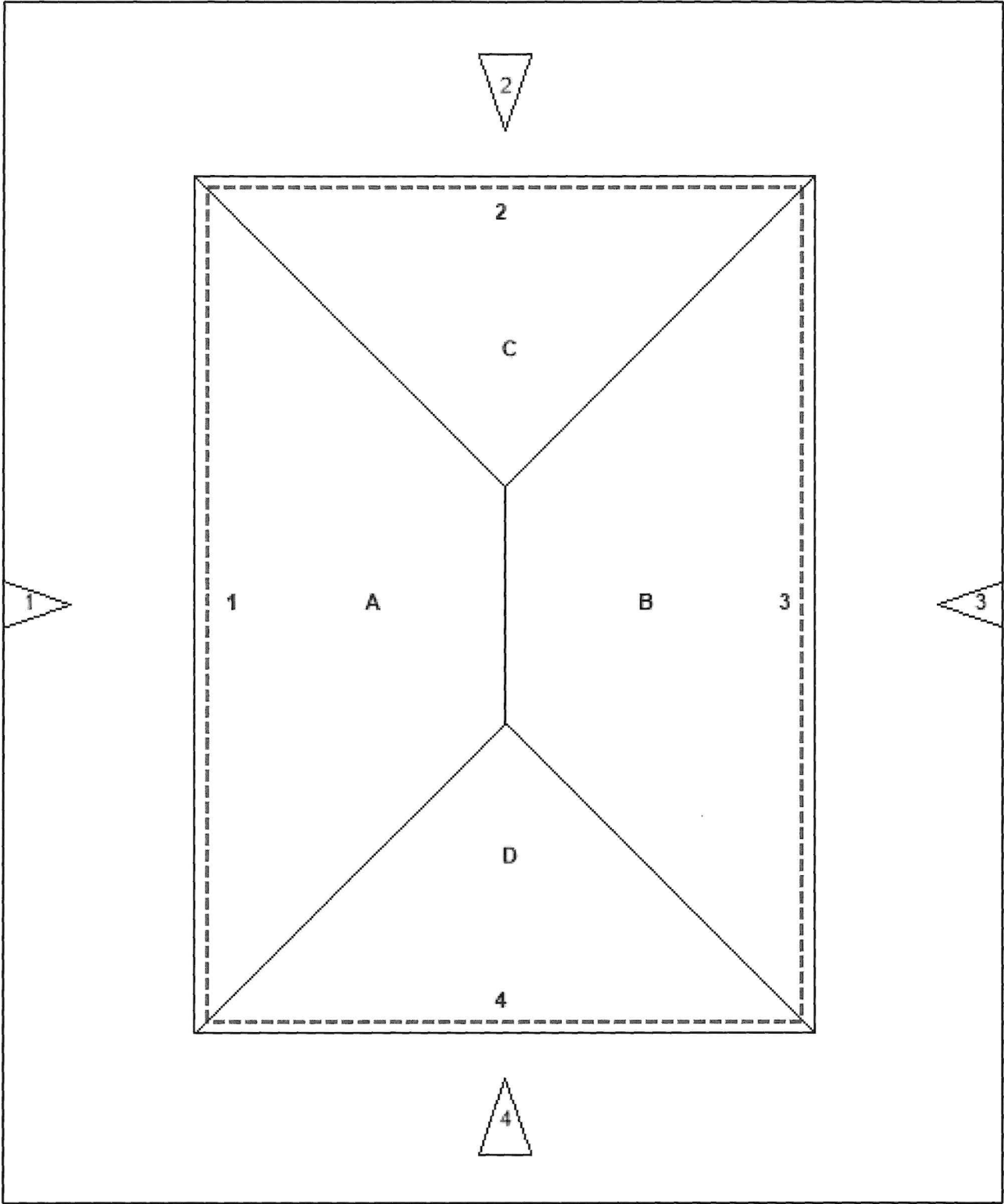
Wall	Length (ft)	Overhang (ft)
1	140	2.00
2	100.0	2.00
3	140	2.00
4	100.0	2.00

Eave Height: 16.0 ft
 Parapet Height: 0.00 ft
 Parapet Enclosure: Enclosed
 Roof Shape: Hipped

Roof	Slope (X:12)
A & B	4.00
C & D	4.00



Composite Drawing



Components & Cladding

<u>Description</u>	<u>Wall/Roof</u>	<u>Surface</u>	<u>Zone</u>	<u>Span</u>	<u>Width</u>	<u>Area</u>
10.	Wall	1	4	0.00 ft	0.00 ft	10.0 ft ²
15.	Wall	1	4	0.00 ft	0.00 ft	15.0 ft ²
20.	Wall	1	4	0.00 ft	0.00 ft	20.0 ft ²
30.	Wall	1	4	0.00 ft	0.00 ft	30.0 ft ²
50.	Wall	1	4	0.00 ft	0.00 ft	50.0 ft ²
80.	Wall	1	4	0.00 ft	0.00 ft	80.0 ft ²
32	Roof	A	1	0.00 ft	0.00 ft	32.0 ft ²
10.	Roof	A	1	0.00 ft	0.00 ft	10.0 ft ²
120.	Wall	1	4	0.00 ft	0.00 ft	120 ft ²

ASCE 7-22 Wind Load Report

Components & Cladding

December 09, 2025

This data was calculated using the components and cladding method.

Component Description	Surface	Zone	z (ft)	q (psf)	GCp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
10.	1	4	24.3	88.3	1.00	0.180	88.3	72.4	104
			24.3	88.3	-1.10		-97.1	-113	-81.2
15.	1	4	24.3	88.3	0.969	0.180	85.6	69.7	101
			24.3	88.3	-1.07		-94.4	-110	-78.5
20.	1	4	24.3	88.3	0.947	0.180	83.6	67.7	99.5
			24.3	88.3	-1.05		-92.4	-108	-76.6
30.	1	4	24.3	88.3	0.916	0.180	80.9	65.0	96.8
			24.3	88.3	-1.02		-89.7	-106	-73.8
50.	1	4	24.3	88.3	0.877	0.180	77.4	61.5	93.3
			24.3	88.3	-0.977		-86.2	-102	-70.3
80.	1	4	24.3	88.3	0.841	0.180	74.2	58.3	90.1
			24.3	88.3	-0.941		-83.1	-98.9	-67.2
32	A	1	24.3	88.3	0.498	0.180	44.0	28.1	59.9
			24.3	88.3	-1.41		-125	-141	-109
			24.3	88.3	-2.42		-214		
10.	A	1	24.3	88.3	0.700	0.180	61.8	45.9	77.7
			24.3	88.3	-1.80		-159	-175	-143
			24.3	88.3	-2.90		-256		
120.	1	4	24.3	88.3	0.809	0.180	71.5	55.6	87.4
			24.3	88.3	-0.909		-80.3	-96.2	-64.4

ASCE 7-22 Wind Load Report

Main Wind Force Resisting System - Wind Direction 1

December 09, 2025

This data was calculated using the building of all heights method.

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Windward Wall	15.0	79.8	0.853	0.800	0.180	54.4	38.5	70.3
		16.0	80.8				55.1	39.2	71.0
	Overhang Top	24.3	88.3		-0.363		-27.3		
	Overhang Bot	16.0	80.8		0.800		55.1		
2	Side Wall	24.3	88.3	0.853	-0.700	0.180	-52.7	-68.6	-36.8
3	Leeward Wall	24.3	88.3	0.853	-0.500	0.180	-37.6	-53.5	-21.7
4	Side Wall	24.3	88.3	0.853	-0.700	0.180	-52.7	-68.6	-36.8
A	Windward Roof	24.3	88.3	0.853	-0.363	0.180	-27.3	-43.2	-11.4
B	Leeward Roof	24.3	88.3	0.853	-0.569	0.180	-42.8	-58.7	-26.9
C&D Roof		0.00 - 12.2*	88.3	0.853	-0.900	0.180	-67.8	-83.7	-51.9
		12.2 - 24.3*	88.3				-67.8	-83.7	-51.9
		24.3 - 48.7*	88.3				-37.6	-53.5	-21.7
		48.7 - 100.0*	88.3				-22.6	-38.5	-6.69
		0.00 - 100.0*	88.3				-13.6	-29.4	2.34

This is load case 1 in ASCE 7-22 Figure 27.3-8. See Figure 27.3-8 for other cases.

* Distance from windward edge.

ASCE 7-22 Wind Load Report

Main Wind Force Resisting System - Wind Direction 2

December 09, 2025

This data was calculated using the building of all heights method.

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Side Wall	24.3	88.3	0.862	-0.700	0.180	-53.3	-69.2	-37.4
2	Windward Wall	15.0	79.8	0.862	0.800	0.180	55.0	39.1	70.9
		16.0	80.8				55.8	39.9	71.7
	Overhang Top	24.3	88.3		-0.363		-27.6		
	Overhang Bot	16.0	80.8		0.800		55.8		
3	Side Wall	24.3	88.3	0.862	-0.700	0.180	-53.3	-69.2	-37.4
4	Leeward Wall	24.3	88.3	0.862	-0.420	0.180	-32.0	-47.9	-16.1
C	Windward Roof	24.3	88.3	0.862	-0.363	0.180	-27.6	-43.5	-11.7
D	Leeward Roof	24.3	88.3	0.862	-0.569	0.180	-43.3	-59.2	-27.4
A&B Roof		0.00 - 12.2*	88.3	0.862	-0.900	0.180	-68.5	-84.4	-52.6
		12.2 - 24.3*	88.3				-68.5	-84.4	-52.6
		24.3 - 48.7*	88.3		-0.500		-38.1	-54.0	-22.2
		48.7 - 140*	88.3		-0.300		-22.8	-38.7	-6.95
		0.00 - 140*	88.3		-0.180		-13.7	-29.6	2.19

This is load case 1 in ASCE 7-22 Figure 27.3-8. See Figure 27.3-8 for other cases.

* Distance from windward edge.

ASCE 7-22 Wind Load Report

Main Wind Force Resisting System - Wind Direction 3

December 09, 2025

This data was calculated using the building of all heights method.

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Leeward Wall	24.3	88.3	0.853	-0.500	0.180	-37.6	-53.5	-21.7
2	Side Wall	24.3	88.3	0.853	-0.700	0.180	-52.7	-68.6	-36.8
3	Windward Wall	15.0	79.8	0.853	0.800	0.180	54.4	38.5	70.3
		16.0	80.8				55.1	39.2	71.0
	Overhang Top	24.3	88.3		-0.363		-27.3		
	Overhang Bot	16.0	80.8		0.800		55.1		
4	Side Wall	24.3	88.3	0.853	-0.700	0.180	-52.7	-68.6	-36.8
B	Windward Roof	24.3	88.3	0.853	-0.363	0.180	-27.3	-43.2	-11.4
A	Leeward Roof	24.3	88.3	0.853	-0.569	0.180	-42.8	-58.7	-26.9
C&D Roof		0.00 - 12.2*	88.3	0.853	-0.900	0.180	-67.8	-83.7	-51.9
		12.2 - 24.3*	88.3				-67.8	-83.7	-51.9
		24.3 - 48.7*	88.3		-0.500		-37.6	-53.5	-21.7
		48.7 - 100.0*	88.3		-0.300		-22.6	-38.5	-6.69
		0.00 - 100.0*	88.3		-0.180		-13.6	-29.4	2.34

This is load case 1 in ASCE 7-22 Figure 27.3-8. See Figure 27.3-8 for other cases.

* Distance from windward edge.

ASCE 7-22 Wind Load Report

Main Wind Force Resisting System - Wind Direction 4

December 09, 2025

This data was calculated using the building of all heights method.

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Side Wall	24.3	88.3	0.862	-0.700	0.180	-53.3	-69.2	-37.4
2	Leeward Wall	24.3	88.3	0.862	-0.420	0.180	-32.0	-47.9	-16.1
3	Side Wall	24.3	88.3	0.862	-0.700	0.180	-53.3	-69.2	-37.4
4	Windward Wall	15.0	79.8	0.862	0.800	0.180	55.0	39.1	70.9
		16.0	80.8				55.8	39.9	71.7
	Overhang Top	24.3	88.3		-0.363		-27.6		
	Overhang Bot	16.0	80.8		0.800		55.8		
D	Windward Roof	24.3	88.3	0.862	-0.363	0.180	-27.6	-43.5	-11.7
C	Leeward Roof	24.3	88.3	0.862	-0.569	0.180	-43.3	-59.2	-27.4
A&B Roof		0.00 - 12.2*	88.3	0.862	-0.900	0.180	-68.5	-84.4	-52.6
		12.2 - 24.3*	88.3				-68.5	-84.4	-52.6
		24.3 - 48.7*	88.3		-0.500		-38.1	-54.0	-22.2
		48.7 - 140*	88.3		-0.300		-22.8	-38.7	-6.95
		0.00 - 140*	88.3		-0.180		-13.7	-29.6	2.19

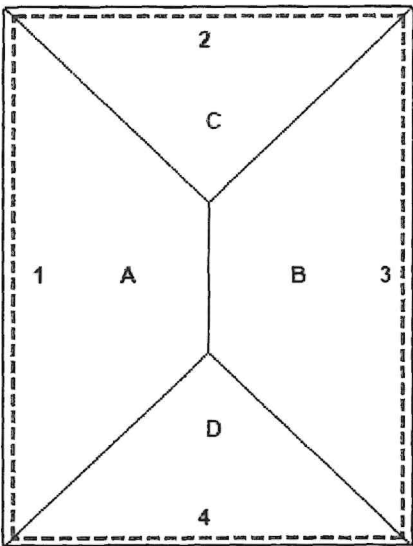
This is load case 1 in ASCE 7-22 Figure 27.3-8. See Figure 27.3-8 for other cases.

* Distance from windward edge.

Bhagwansingh family residence

June 02, 2025

Address: 8100 SW 120th Street, Pinecrest, FL 33156



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These calculations are based on the ASCE 7-98, ASCE 7-02, ASCE 7-05, ASCE 7-10, and ASCE7-16 Standard Practices for determining the minimum wind loads, and intended performance goals, for buildings, other structures and their nonstructural components that are subject to building code requirements. While the information presented by this program is believed to be correct, SDG, Inc. neither intends for this program to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such a professional in interpreting and applying the results of the report provided by the WLS 2019 program.

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Signature / Stamp

Site Information

Wind Dir.	Exposure
1	C
2	C
3	C
4	C

Basic Wind Speed: 175 mph

Topography: Flat

Optional Factors

This project uses load combinations from ASCE 7.

Structure Information

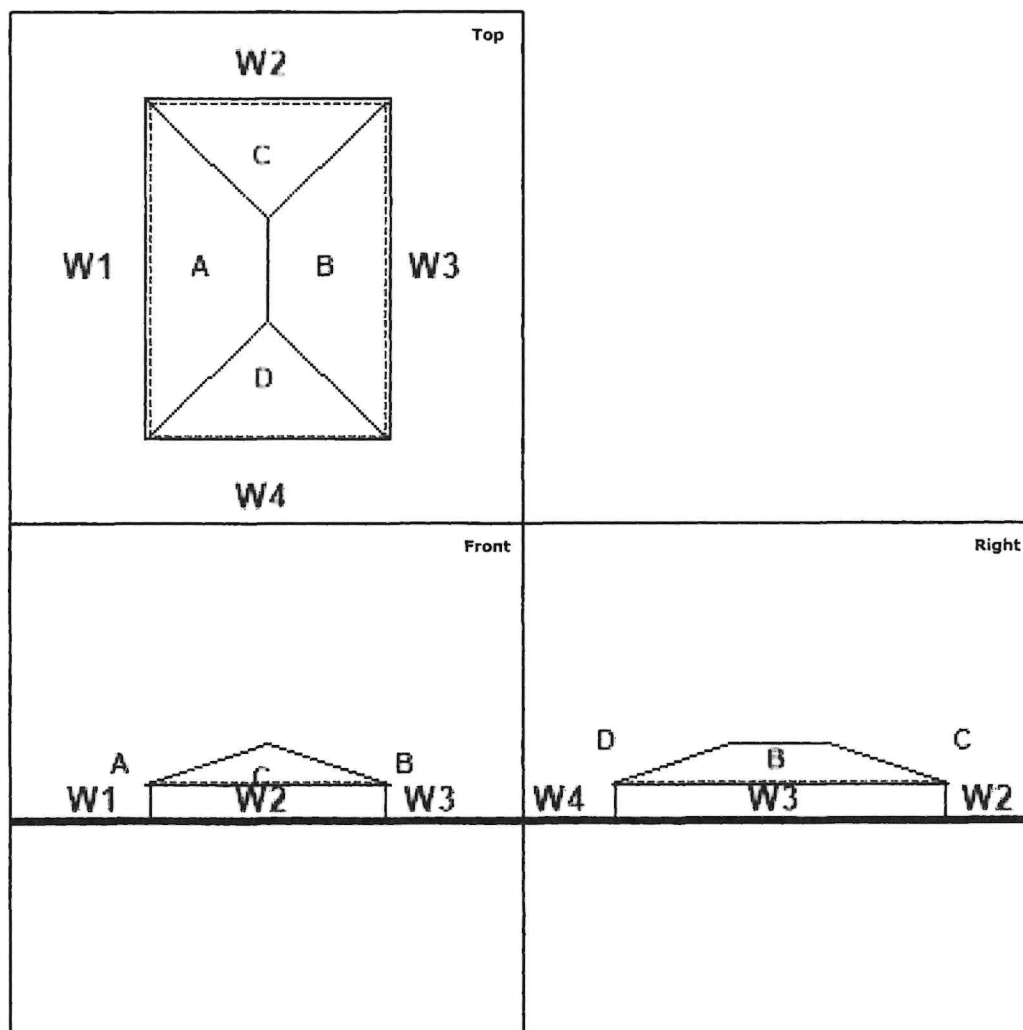
Structure Type: Building
 Structure Category: II
 Enclosure Classification: Enclosed

Main Section

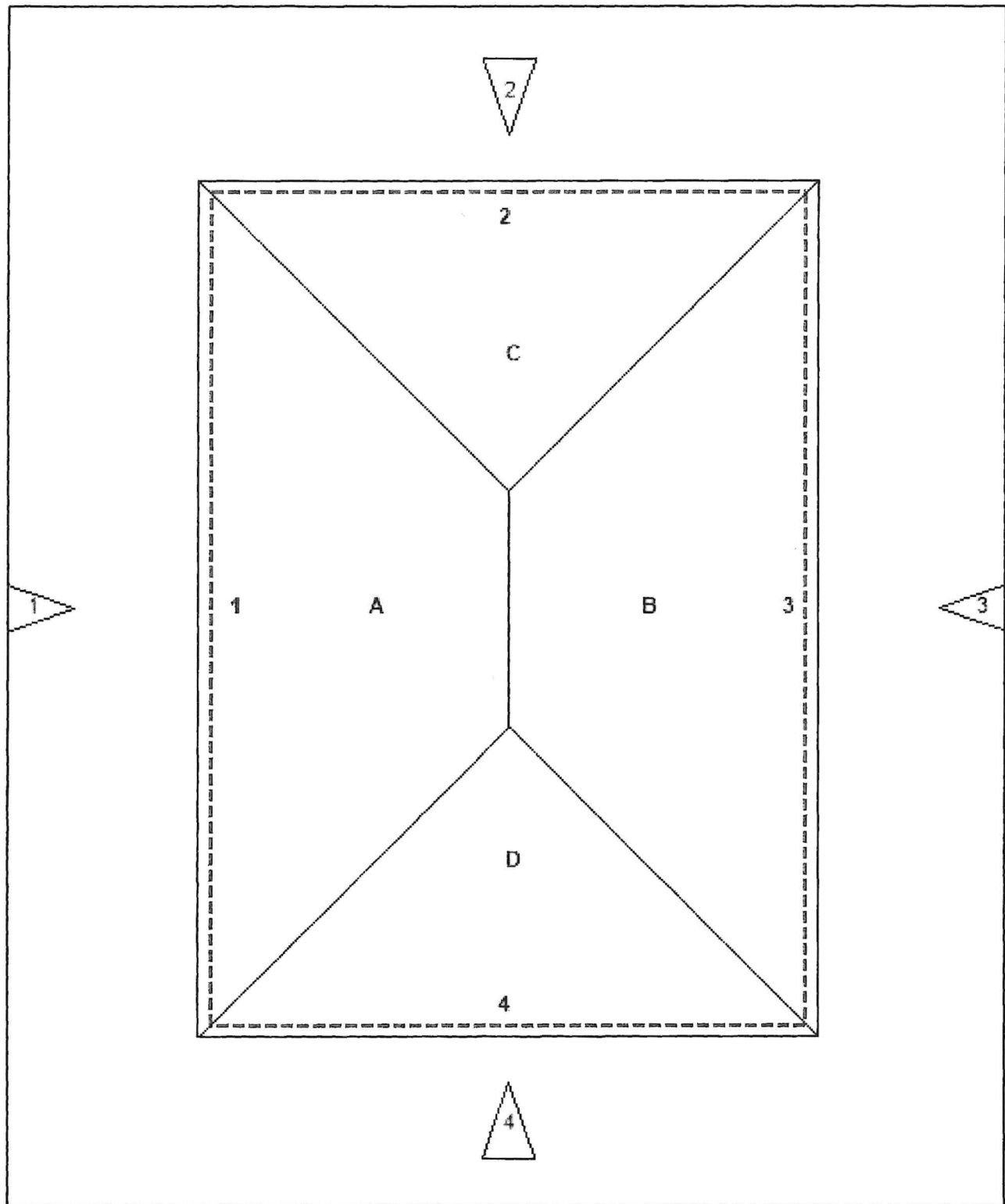
Wall	Length (ft)	Overhang (ft)
1	140	2.00
2	100.0	2.00
3	140	2.00
4	100.0	2.00

Eave Height: 16.0 ft
 Parapet Height: 0.00 ft
 Parapet Enclosure: Enclosed
 Roof Shape: Hipped

Roof	Slope (X:12)
A & B	4.00
C & D	4.00



Composite Drawing



Bhagwansingh family residence

June 02, 2025

Input Cont.

Components & Cladding

<u>Description</u>	<u>Wall/Roof</u>	<u>Surface</u>	<u>Zone</u>	<u>Span</u>	<u>Width</u>	<u>Area</u>
10.	Wall	1	4	0.00 ft	0.00 ft	10.0 ft ²
15.	Wall	1	4	0.00 ft	0.00 ft	15.0 ft ²
20.	Wall	1	4	0.00 ft	0.00 ft	20.0 ft ²
30.	Wall	1	4	0.00 ft	0.00 ft	30.0 ft ²
50.	Wall	1	4	0.00 ft	0.00 ft	50.0 ft ²
80.	Wall	1	4	0.00 ft	0.00 ft	80.0 ft ²
32	Roof	A	1	0.00 ft	0.00 ft	32.0 ft ²
10.	Roof	A	1	0.00 ft	0.00 ft	10.0 ft ²
120.	Wall	1	4	0.00 ft	0.00 ft	120 ft ²

Bhagwansingh family residence

ASCE 7-16 Wind Load Report

June 02, 2025

This data was calculated using the components and cladding method.

Component Description	Surface	Zone	z (ft)	q (psf)	GCp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
10.	1	4	24.3	62.6	1.00	0.180	62.6	51.3	73.9
			24.3	62.6	-1.10		-68.9	-80.1	-57.6
15.	1	4	24.3	62.6	0.969	0.180	60.7	49.4	71.9
			24.3	62.6	-1.07		-66.9	-78.2	-55.6
20.	1	4	24.3	62.6	0.947	0.180	59.3	48.0	70.5
			24.3	62.6	-1.05		-65.5	-76.8	-54.3
30.	1	4	24.3	62.6	0.916	0.180	57.3	46.1	68.6
			24.3	62.6	-1.02		-63.6	-74.9	-52.3
50.	1	4	24.3	62.6	0.877	0.180	54.9	43.6	66.1
			24.3	62.6	-0.977		-61.1	-72.4	-49.9
80.	1	4	24.3	62.6	0.841	0.180	52.6	41.4	63.9
			24.3	62.6	-0.941		-58.9	-70.1	-47.6
32	A	1	24.3	62.6	0.498	0.180	31.2	19.9	42.4
			24.3	62.6	-1.21		-75.9	-87.2	-64.6
			24.3	62.6	-1.90		-119		
10.	A	1	24.3	62.6	0.700	0.180	43.8	32.6	55.1
			24.3	62.6	-1.30		-81.4	-92.6	-70.1
			24.3	62.6	-1.80		-113		
120.	1	4	24.3	62.6	0.809	0.180	50.7	39.4	61.9
			24.3	62.6	-0.909		-56.9	-68.2	-45.7

Bhagwansingh family residence

June 02, 2025

ASCE 7-16 Wind Load Report - Wind Direction 1

This data was calculated using the building of all heights method.

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Windward Wall	15.0	56.5	0.853	0.800	0.180	38.6	27.3	49.8
		16.0	57.3				39.1	27.8	50.4
	Overhang Top	24.3	62.6		0.137		7.33		
		24.3	62.6		-0.363		-19.4		
	Overhang Bot	16.0	57.3		0.800		39.1		
2	Side Wall	24.3	62.6	0.853	-0.700	0.180	-37.4	-48.6	-26.1
3	Leeward Wall	24.3	62.6	0.853	-0.500	0.180	-26.7	-38.0	-15.4
4	Side Wall	24.3	62.6	0.853	-0.700	0.180	-37.4	-48.6	-26.1
A	Windward Roof	24.3	62.6	0.853	0.137	0.180	7.32	-3.95	18.6
		24.3	62.6		-0.363		-19.4	-30.6	-8.10
B	Leeward Roof	24.3	62.6	0.853	-0.569	0.180	-30.3	-41.6	-19.1
C&D	Roof	0.00 - 12.2*	62.6	0.853	-0.900	0.180	-48.0	-59.3	-36.8
		12.2 - 24.3*	62.6				-48.0	-59.3	-36.8
		24.3 - 48.7*	62.6				-26.7	-38.0	-15.4
		48.7 - 100.0*	62.6				-16.0	-27.3	-4.74
		0.00 - 100.0*	62.6				-9.61	-20.9	1.66

This is load case 1 in ASCE 7-16 Figure 27.3-8. See Figure 27.3-8 for other cases.

* Distance from windward edge.

Bhagwansingh family residence

ASCE 7-16 Wind Load Report - Wind Direction 2

June 02, 2025

This data was calculated using the building of all heights method.

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Side Wall	24.3	62.6	0.862	-0.700	0.180	-37.8	-49.1	-26.5
2	Windward Wall	15.0	56.5	0.862	0.800	0.180	39.0	27.7	50.3
		16.0	57.3				39.5	28.3	50.8
	Overhang Top	24.3	62.6		0.137		7.42		
		24.3	62.6		-0.363		-19.6		
	Overhang Bot	16.0	57.3		0.800		39.5		
3	Side Wall	24.3	62.6	0.862	-0.700	0.180	-37.8	-49.1	-26.5
4	Leeward Wall	24.3	62.6	0.862	-0.420	0.180	-22.7	-33.9	-11.4
C	Windward Roof	24.3	62.6	0.862	0.137	0.180	7.41	-3.86	18.7
		24.3	62.6		-0.363		-19.6	-30.9	-8.31
D	Leeward Roof	24.3	62.6	0.862	-0.569	0.180	-30.7	-42.0	-19.4
A&B	Roof	0.00 - 12.2*	62.6	0.862	-0.900	0.180	-48.6	-59.8	-37.3
		12.2 - 24.3*	62.6				-48.6	-59.8	-37.3
		24.3 - 48.7*	62.6		-0.500		-27.0	-38.3	-15.7
		48.7 - 140*	62.6		-0.300		-16.2	-27.5	-4.93
		0.00 - 140*	62.6		-0.180		-9.72	-21.0	1.55

This is load case 1 in ASCE 7-16 Figure 27.3-8. See Figure 27.3-8 for other cases.

* Distance from windward edge.

Bhagwansingh family residence

ASCE 7-16 Wind Load Report - Wind Direction 3

June 02, 2025

This data was calculated using the building of all heights method.

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Leeward Wall	24.3	62.6	0.853	-0.500	0.180	-26.7	-38.0	-15.4
2	Side Wall	24.3	62.6	0.853	-0.700	0.180	-37.4	-48.6	-26.1
3	Windward Wall	15.0	56.5	0.853	0.800	0.180	38.6	27.3	49.8
		16.0	57.3				39.1	27.8	50.4
	Overhang Top	24.3	62.6		0.137		7.33		
		24.3	62.6		-0.363		-19.4		
	Overhang Bot	16.0	57.3		0.800		39.1		
4	Side Wall	24.3	62.6	0.853	-0.700	0.180	-37.4	-48.6	-26.1
B	Windward Roof	24.3	62.6	0.853	0.137	0.180	7.32	-3.95	18.6
		24.3	62.6		-0.363		-19.4	-30.6	-8.10
A	Leeward Roof	24.3	62.6	0.853	-0.569	0.180	-30.3	-41.6	-19.1
C&D	Roof	0.00 - 12.2*	62.6	0.853	-0.900	0.180	-48.0	-59.3	-36.8
		12.2 - 24.3*	62.6				-48.0	-59.3	-36.8
		24.3 - 48.7*	62.6		-0.500		-26.7	-38.0	-15.4
		48.7 - 100.0*	62.6		-0.300		-16.0	-27.3	-4.74
		0.00 - 100.0*	62.6		-0.180		-9.61	-20.9	1.66

This is load case 1 in ASCE 7-16 Figure 27.3-8. See Figure 27.3-8 for other cases.

* Distance from windward edge.

Bhagwansingh family residence

ASCE 7-16 Wind Load Report - Wind Direction 4

June 02, 2025

This data was calculated using the building of all heights method.

#	Surface	z (ft)	q (psf)	G	Cp	GCpi	Ext Pres (psf)	Net w/ +GCpi (psf)	Net w/ -GCpi (psf)
1	Side Wall	24.3	62.6	0.862	-0.700	0.180	-37.8	-49.1	-26.5
2	Leeward Wall	24.3	62.6	0.862	-0.420	0.180	-22.7	-33.9	-11.4
3	Side Wall	24.3	62.6	0.862	-0.700	0.180	-37.8	-49.1	-26.5
4	Windward Wall	15.0	56.5	0.862	0.800	0.180	39.0	27.7	50.3
		16.0	57.3				39.5	28.3	50.8
	Overhang Top	24.3	62.6		0.137		7.42		
		24.3	62.6		-0.363		-19.6		
	Overhang Bot	16.0	57.3		0.800		39.5		
D	Windward Roof	24.3	62.6	0.862	0.137	0.180	7.41	-3.86	18.7
		24.3	62.6		-0.363		-19.6	-30.9	-8.31
C	Leeward Roof	24.3	62.6	0.862	-0.569	0.180	-30.7	-42.0	-19.4
A&B	Roof	0.00 - 12.2*	62.6	0.862	-0.900	0.180	-48.6	-59.8	-37.3
		12.2 - 24.3*	62.6				-48.6	-59.8	-37.3
		24.3 - 48.7*	62.6		-0.500		-27.0	-38.3	-15.7
		48.7 - 140*	62.6		-0.300		-16.2	-27.5	-4.93
		0.00 - 140*	62.6		-0.180		-9.72	-21.0	1.55

This is load case 1 in ASCE 7-16 Figure 27.3-8. See Figure 27.3-8 for other cases.

* Distance from windward edge.

designengineering & supply, Inc.

2799 NW Boca Raton Blvd. #111

Boca Raton, FL 33431

Phone: 561-705-2930 Fax: 561-431-3211

Email: yemeniciler@netzero.net , desupply@aol.com

June 11, 2025

City Of Pinecrest Building Department
Pinecrest, Florida

Re: Bhagwansing Residence Calculations
8100 SW 120th Street
Pinecrest, FI

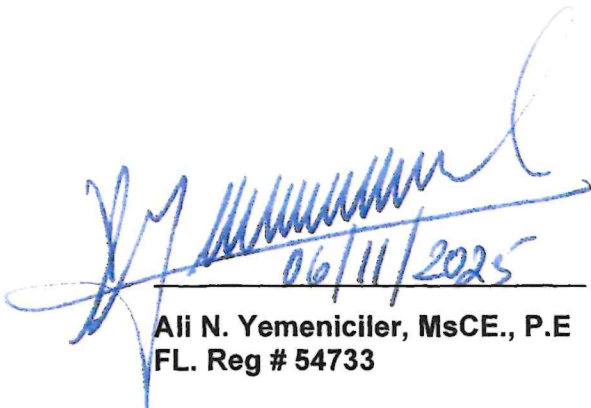
Dear Sir/Madam:

Please find the attached calculations for the above-mentioned project.

• Wind load calculations	1-10
• Roof Truss Up-lift calculations	11-12
• Concrete Beam & Lintel Calculations	13-53
• Steel Column & Base plate Calculations	54-58
• Masonry Wall Calculations	59-61
• Foundation calculations	62-80
• Diaphragm Calculations	81-84

If you have any questions, please do not hesitate to call.

Best Regards,



06/11/2025

Ali N. Yemeniciler, MsCE., P.E
FL. Reg # 54733

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Boca Raton, FL 33431

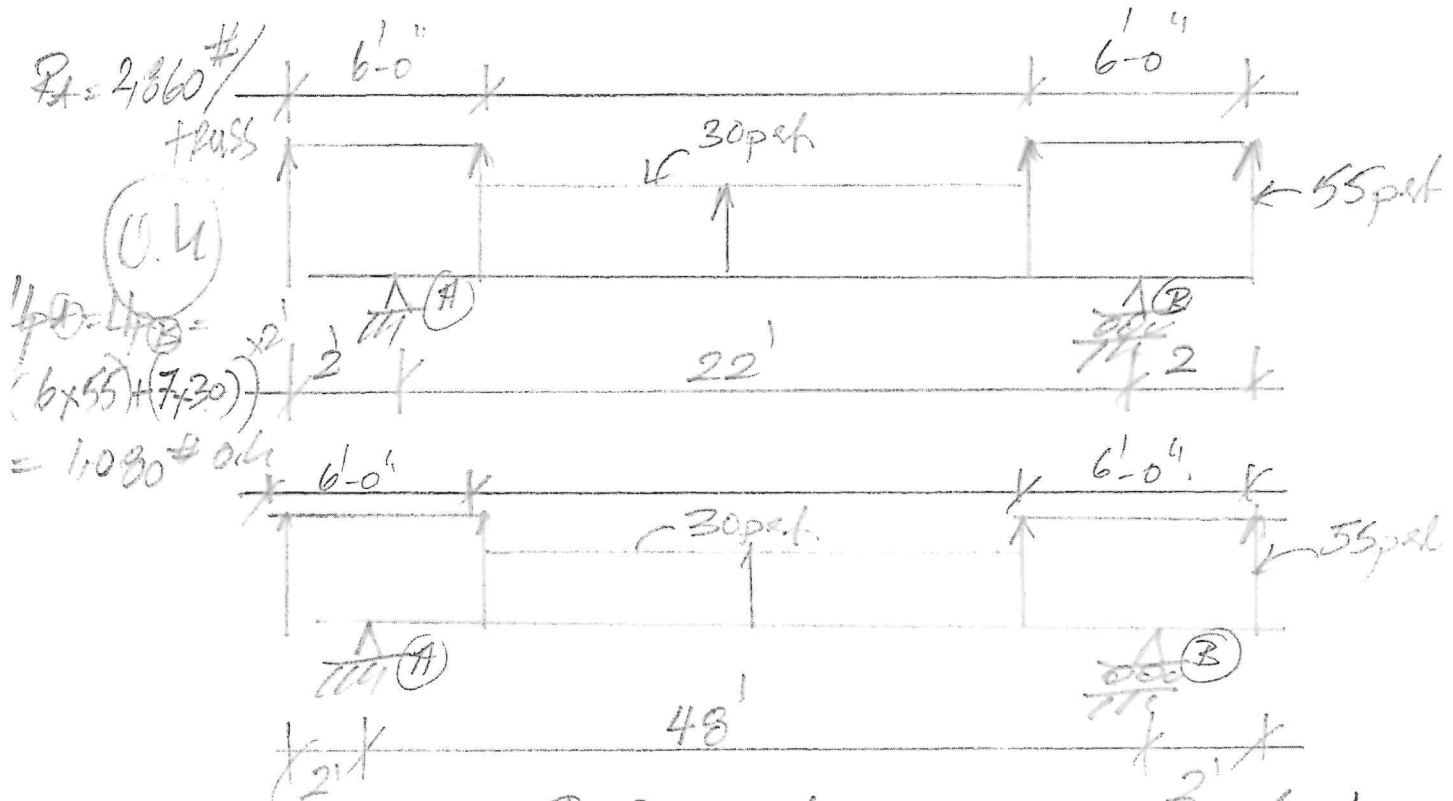
P: 561-705-2930 F: 561-431-3211

Email: yemeniciler@netzero.net

desupply@aol.com

Re: Bhagwansingh house
Pine Crest, FL

* Roof Uplift & Reaction Calculations *



Best Regards,

Ali N. Yemeniciler, MsCE., P.E.
FL. Reg # 54733

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TRUSS

0.4

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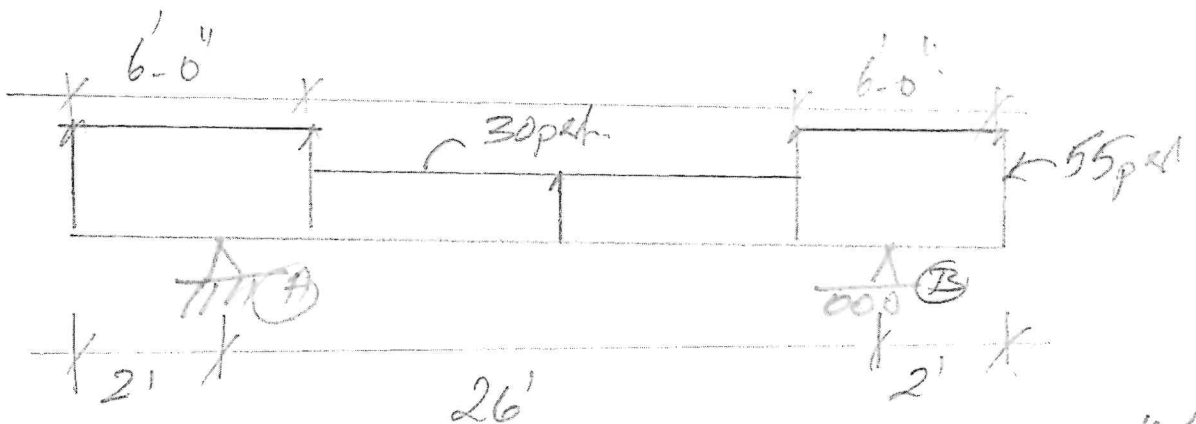
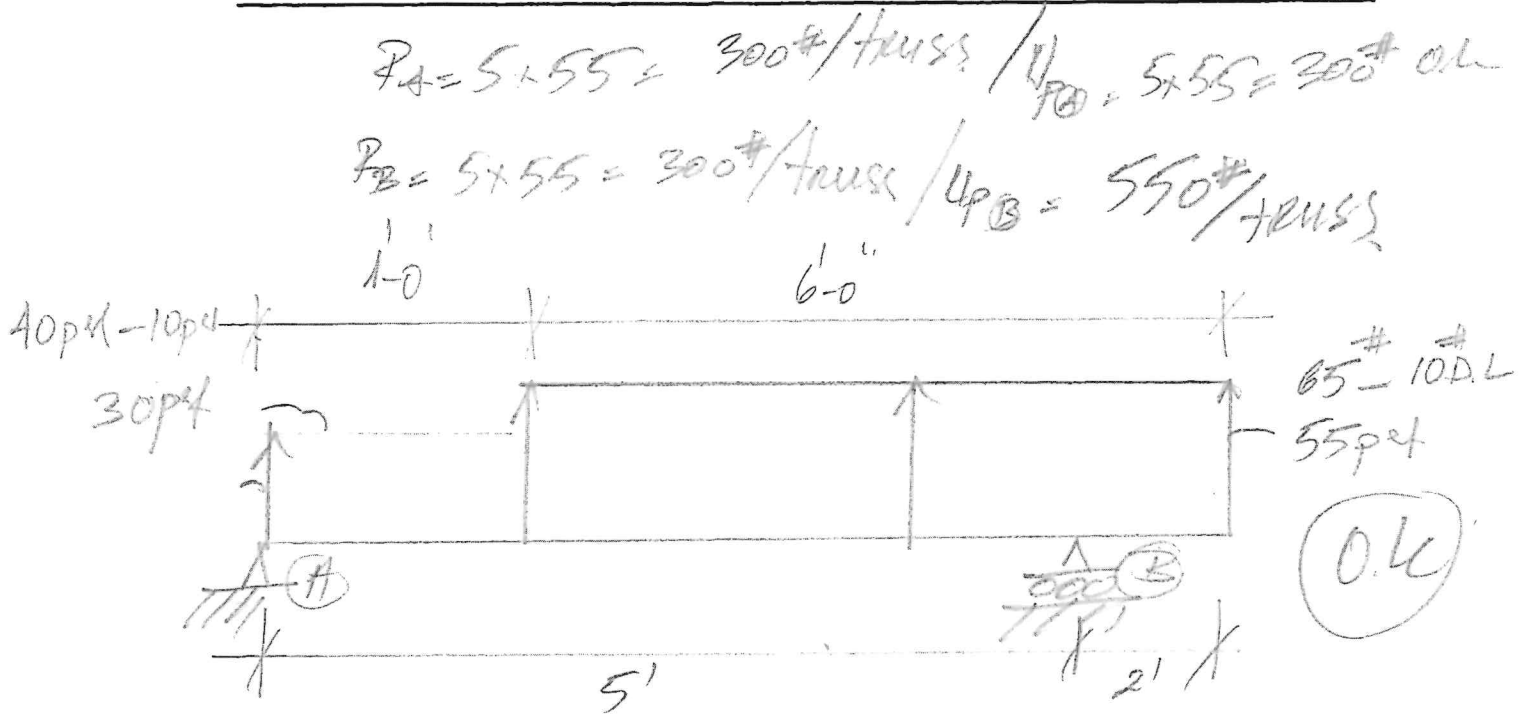
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Boca Raton, FL 33431

P: 561-705-2930 F: 561-431-3211

Email: yemeniciler@netzero.net

desupply@aol.com



Best Regards,

$$P_A = P_B = 15' \times 55 \text{ #/ft} \times 2' = 1,650 \text{ #/truss}$$

$$U_{PA} = U_{PB} = (6 \times 55) + (9 \times 30) \times 2' = 1,200 \text{ #}$$

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FL. Reg # 54733

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$P_{00} \text{ fan}$
(O.L.)

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Email: yemeniciler@netzero.net

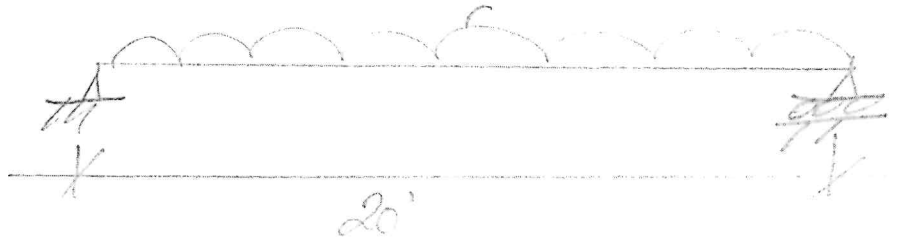
desupply@aol.com

Re: Bhagwansingh house

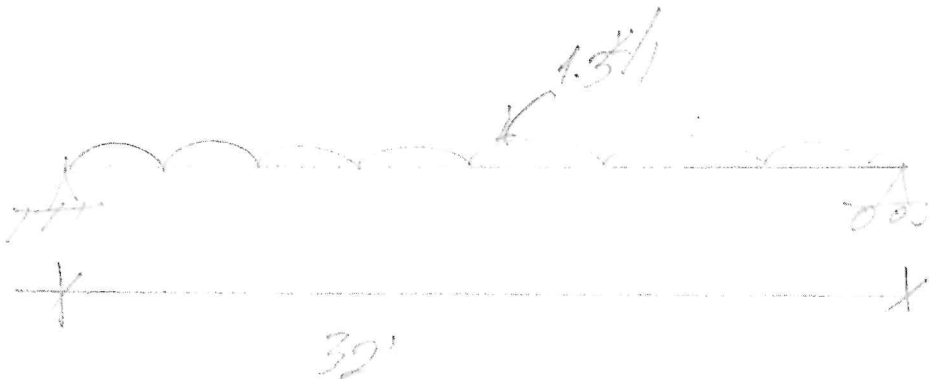
Time cast, FL

Concrete Beam / Lintel calculation

8' x 40"
BI-11 2#6 T, 2#4 S Top
± 30' 10" L



BI-7 8' x 48"
2#6 T, 2
2#2 S
± 30' 10" L



Best Regards,

Ali N. Yemeniciler, MsCE., P.E
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13

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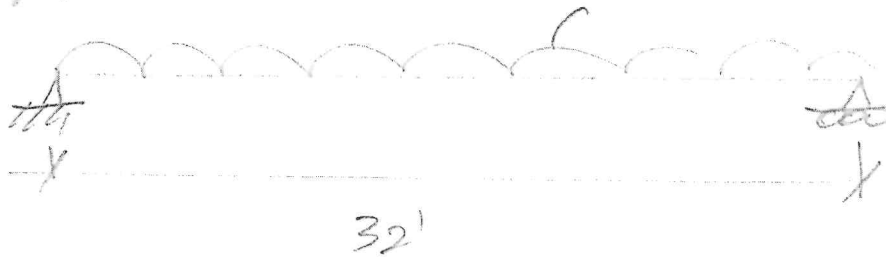
Email: yemeniciler@netzero.net

desupply@aol.com

B1-8

18' x 30'
5#7 T&B
#3082

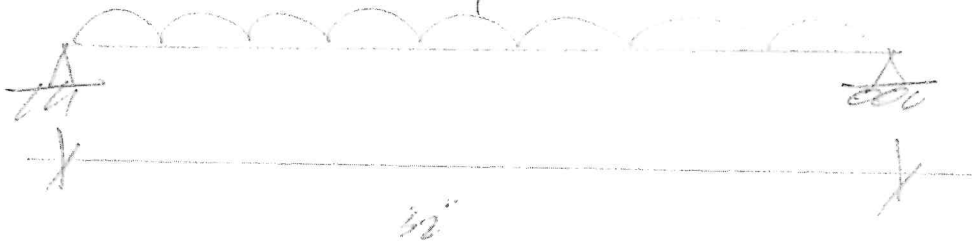
.64



B1-3 13' x 24'

5#7 T&B
#3082

.64



Best Regards,

14

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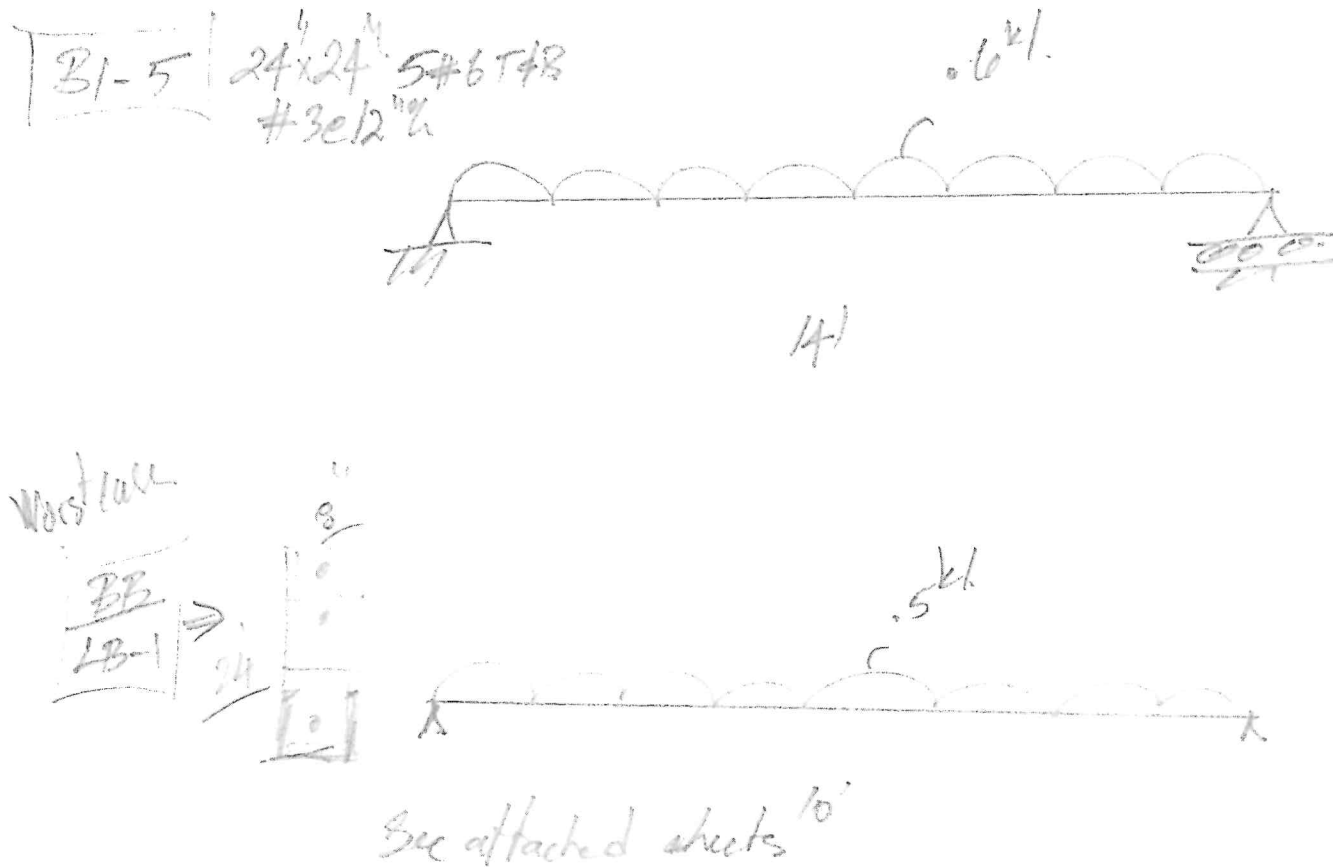
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SPECIFICATIONS

PRODUCT DESCRIPTION

High strength precast and prestressed concrete lintels designed to be used unfilled or filled with grout to form a composite reinforced beam using concrete masonry units.

MATERIALS

- f'c 8" precast lintels = 3500 psi
- f'c 8" prestressed, 6" and 12" precast lintels = 6000 psi
- f'c 4" precast lintels = 3000 psi
- Grout per ASTM C476 f'g = 3000 psi w/maximum 3/8 inch aggregate and 8 to 11 inch slump.
- Concrete masonry units (CMU) per ASTM C90 with minimum net area compressive strength = 1900 psi
- Rebar per ASTM A615 Grade 60
- Prestressing strand per ASTM A416 Grade 270 low relaxation
- 7/32 inch wire per ASTM A510
- Mortar per ASTM C270 Type M or S

GENERAL NOTES

1. Provide full mortar head and bed joints.
2. Shore filled lintels as required.
3. Installation of lintel must comply with architectural and/or structural drawings.
4. U-Lintels are manufactured with 5-1/2 inch long notches at ends to accommodate vertical cell reinforcing and grouting.
5. All lintels meet or exceed L/360 vertical deflection, except lintels 17'-4" and longer with a nominal height of 8" meet or exceed L/180.
6. Bottom field added rebar to be located at the bottom of lintel cavity.
7. 7/32 inch diameter wire stirrups are welded to the bottom steel for mechanical anchorage.
8. Cast-in-place concrete may be provided in composite lintel in lieu of concrete masonry units.
9. Safe load ratings based on rational design analysis per ACI 318 and ACI 530
10. Product Approvals: Miami-Dade County, Florida Nos. 03-0605.05 and 03-0605.04. Florida Certificate of Product Approval No. FL158.
11. The exterior surface of lintels installed in exterior concrete masonry walls shall have a coating of stucco applied in accordance with ASTM C-926 or other approved coating.
12. Lintels loaded simultaneously with vertical (gravity or uplift) and horizontal (lateral) loads should be checked for the combined loading with the following equation:

$$\frac{\text{Applied vertical load}}{\text{Safe vertical load}} + \frac{\text{Applied horizontal load}}{\text{Safe horizontal load}} \leq 1.0$$

SAFE LOAD TABLE NOTES

1. All values based on minimum 4 inch nominal bearing. Exception: Safe loads for unfilled lintels must be reduced by 20% if bearing length is less than 6-1/2 inches.
2. N.R. = Not Rated.
3. Safe loads are superimposed allowable load.
4. Safe loads based on Grade 40 or Grade 60 field rebar.
5. Additional lateral load capacity can be obtained by the designer by providing additional reinforced masonry above the precast lintel. See Reinforced CMU on Page 4.
6. One #7 rebar may be substituted for two #5 rebars in 8" lintels only.
7. The designer may evaluate concentrated loads from the safe load tables by calculating the maximum resisting moment and shear at the face of support.
8. For composite lintel heights not shown, use safe load from next lower height.
9. For lintel lengths not shown, use safe load from the next longest length shown.
10. All safe loads in units of pounds per linear foot.
11. All safe loads based on simply supported span.
12. The number in the parenthesis indicates the percent reduction for grade 40 field added rebar.
 Example: 7'6" lintel Type 8F32-1B safe gravity load = 6472 (15) w/15% reduction => 6472 (.85) = 5501 plf

SAFE LOADS

		UPLIFT						LATERAL			
LENGTH*	TYPE	8F8-1T	8F12-1T	8F16-1T	8F20-1T	8F24-1T	8F28-1T	8F32-1T	8U8	8F8	REIN. CMU**
		8F8-2T	8F12-2T	8F16-2T	8F20-2T	8F24-2T	8F28-2T	8F32-2T			
2'-10" (34")	PRECAST	1972	3173	4460	5747	7034	8321	9608	1293	1642	2135
		1972	3173	4460	5747	7034	8321	9608			
3'-6" (42")	PRECAST	1569	2524	3547	4569	5591	6613	7636	1025	1024	1830
		1569	2524	3547	4569	5591	6613	7636			
4'-0" (48")	PRECAST	1363	2192	3079	3966	4853	5740	6627	765	763	1365
		1363	2192	3079	3966	4853	5740	6627			
4'-6" (54")	PRECAST	1207	1940	2724	3508	4292	5077	5861	592	591	1057
		1207	1940	2724	3508	4292	5077	5861			
5'-4" (64")	PRECAST	1016	1632	2290	2949	3607	4265	4924	411	411	734
		1016	1632	2290	2949	3607	4265	4924			
5'-10" (70")	PRECAST	909	1492	2093	2694	3295	3897	4498	340	339	607
		929	1492	2093	2694	3295	3897	4498			
6'-6" (78")	PRECAST	835 (12)	1340	1880	2419	2959	3498	4038	507	721	483
		835	1340	1880	2419	2959	3498	4038			
7'-6" (90")	PRECAST	727 (23)	1021	1634 (12)	2102 (11)	2571 (10)	3039 (10)	3508 (9)	424	534	357
		727	1166	1634	2102	2571	3039	3508			
9'-4" (112")	PRECAST	591	680	1133 (15)	1471 (15)	1811 (15)	2152 (16)	2494 (15)	326	512	227
		591	851	1326	1705	2084	2463	2842			
10'-6" (126")	PRECAST	530	552	914 (15)	1185 (15)	1458 (15)	1732 (15)	2007 (15)	284	401	178
		530	686	1183	1526	1865	2204	2544			
11'-4" (136")	PRECAST	474	485	798 (15)	1034 (15)	1272 (15)	1510 (15)	1749 (15)	260	452	152
		494	599	1028	1422	1738	2053	2369			
12'-0" (144")	PRECAST	470 (9)	441	723 (14)	936 (14)	1151 (15)	1366 (15)	1582 (15)	244	402	135
		470	543	928	1349	1649	1948	2247			
13'-4" (160")	PRECAST	418 (15)	373	606 (14)	783 (14)	962 (14)	1141 (14)	1321 (14)	217	324	109
		428	455	770	1145	1444	1718	1993			
14'-0" (168")	PRECAST	384 (15)	346	559 (14)	723 (14)	887 (14)	1052 (14)	1218 (14)	205	293	98
		410	420	709	1050	1434 (8)	1694 (8)	1954 (7)			
14'-8" (176")	PRESTRESSED	239	323	519 (13)	671 (13)	823 (13)	976 (14)	1129 (14)	N.R.	284	89
		246	390	655	968	1324 (8)	1625 (11)	1874 (11)			
15'-4" (184")	PRESTRESSED	224	302	485 (13)	626 (13)	767 (13)	909 (13)	1052 (13)	N.R.	259	82
		230	364	609	897	1224 (8)	1562 (14)	1801 (14)			
17'-4" (208")	PRESTRESSED	187	255	404 (12)	520 (12)	637 (12)	754 (12)	872 (12)	N.R.	194	63
		192	303	500	732	993 (8)	1268 (14)	1470 (14)			
19'-4" (232")	PRESTRESSED	162	222	347 (11)	446 (11)	546 (12)	646 (12)	746 (12)	N.R.	148	51
		166	261	424	616	831 (8)	1057 (14)	1225 (14)			
21'-4" (256")	PRESTRESSED	142	198	306 (11)	393 (11)	480 (11)	567 (11)	654 (11)	N.R.	125	42
		142	230	369	531	713 (7)	903 (13)	1046 (13)			
22'-0" (264")	PRESTRESSED	137	192	295 (10)	378 (11)	461 (10)	545 (11)	629 (11)	N.R.	116	39
		137	221	354	508	681 (7)	861 (13)	997 (13)			
24'-0" (288")	PRESTRESSED	124	175	267 (10)	341 (10)	416 (10)	491 (10)	566 (10)	N.R.	91	33
		124	200	316	450	600 (7)	756 (12)	875 (13)			

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

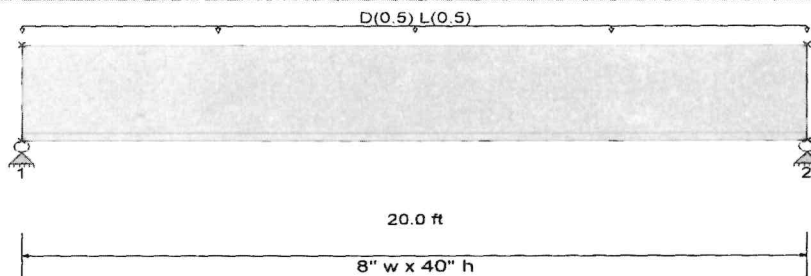
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-22 / IBC 2024

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	F_y - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 8.0 in, Height = 40.0 in

Span #1 Reinforcing....

2-#6 at 3.0 in from Bottom, from 0.0 to 20.0 ft in this span

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.50, L = 0.50 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.632	: 1
Section used for this span		Typical Section	
Mu : Applied		89.333	k-ft
Mn * Phi : Allowable		141.395	k-ft
Location of maximum on span		10.018	ft
Span # where maximum occurs		Span # 1	
Maximum Deflection			
Max Downward Transient Deflection	0.014 in	Ratio =	17766 >=360.0 L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360.0 L Only
Max Downward Total Deflection	0.036 in	Ratio =	6718 >=180.0 Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0 <180.0 Span: 1 : +D+L

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	13.222	13.222
Max Upward from Load Combinations	13.222	13.222
Max Upward from Load Cases	8.222	8.222
D Only	8.222	8.222
+D+L	13.222	13.222
+D+0.750L	11.972	11.972
+0.60D	4.933	4.933

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
L Only	5.000	5.000

Shear Stirrup Requirements

Between 0.00 to 3.17 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 18.000 in
Between 3.21 to 16.79 ft, $V_u < \Phi^*V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
Between 16.83 to 19.96 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 18.000 in

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	0.00 37.00	17.87 17.87	0.00 1.00	24.32	Phi*Vc / 2 < Vu <= Min per 9.6.3.	37.9 18.5
1	+1.20D+1.60L	0.22 37.00	17.48 17.48	3.86 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	0.44 37.00	17.09 17.09	7.64 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	0.66 37.00	16.70 16.70	11.33 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	0.87 37.00	16.30 16.30	14.94 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	1.09 37.00	15.91 15.91	18.46 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	1.31 37.00	15.52 15.52	21.90 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	1.53 37.00	15.13 15.13	25.25 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	1.75 37.00	14.74 14.74	28.51 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	1.97 37.00	14.35 14.35	31.69 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	2.19 37.00	13.96 13.96	34.78 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	2.40 37.00	13.57 13.57	37.79 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	2.62 37.00	13.18 13.18	40.72 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	2.84 37.00	12.79 12.79	43.56 0.91	24.60	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.2 18.5
1	+1.20D+1.60L	3.06 37.00	12.40 12.40	46.31 0.83	24.47	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.0 18.5
1	+1.20D+1.60L	3.28 37.00	12.01 12.01	48.98 0.76	24.35	Vu < Phi*Vc / 2 Not Req'd per 9	24.4 0.0
1	+1.20D+1.60L	3.50 37.00	11.62 11.62	51.56 0.69	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	3.72 37.00	11.23 11.23	54.06 0.64	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	3.93 37.00	10.84 10.84	56.47 0.59	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	4.15 37.00	10.45 10.45	58.79 0.55	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	4.37 37.00	10.06 10.06	61.03 0.51	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	4.59 37.00	9.67 9.67	63.19 0.47	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	4.81 37.00	9.28 9.28	65.26 0.44	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	5.03 37.00	8.88 8.88	67.24 0.41	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	5.25 37.00	8.49 8.49	69.14 0.38	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	5.46 37.00	8.10 8.10	70.96 0.35	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	5.68 37.00	7.71 7.71	72.69 0.33	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	5.90 37.00	7.32 7.32	74.33 0.30	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	6.12 37.00	6.93 6.93	75.89 0.28	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	6.34 37.00	6.54 6.54	77.36 0.26	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	6.56 37.00	6.15 6.15	78.75 0.24	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	6.78 37.00	5.76 5.76	80.05 0.22	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	6.99 37.00	5.37 5.37	81.26 0.20	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	7.21 37.00	4.98 4.98	82.40 0.19	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	7.43 37.00	4.59 4.59	83.44 0.17	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	7.65 37.00	4.20 4.20	84.40 0.15	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	7.87 37.00	3.81 3.81	85.28 0.14	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	8.09 37.00	3.42 3.42	86.07 0.12	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	8.31 37.00	3.03 3.03	86.77 0.11	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	8.52 37.00	2.64 2.64	87.39 0.09	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	8.74 37.00	2.25 2.25	87.92 0.08	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	8.96 37.00	1.86 1.86	88.37 0.06	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	9.18 37.00	1.46 1.46	88.73 0.05	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	9.40 37.00	1.07 1.07	89.01 0.04	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	9.62 37.00	0.68 0.68	89.20 0.02	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	9.84 37.00	0.29 0.29	89.31 0.01	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	10.05 37.00	-0.10 0.10	89.33 0.00	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	10.27 37.00	-0.49 0.49	89.27 0.02	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	10.49 37.00	-0.88 0.88	89.12 0.03	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	10.71 37.00	-1.27 1.27	88.88 0.04	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	10.93 37.00	-1.66 1.66	88.56 0.06	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	11.15 37.00	-2.05 2.05	88.16 0.07	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	11.37 37.00	-2.44 2.44	87.67 0.09	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	11.58 37.00	-2.83 2.83	87.09 0.10	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	11.80 37.00	-3.22 3.22	86.43 0.11	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	12.02 37.00	-3.61 3.61	85.68 0.13	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	12.24 37.00	-4.00 4.00	84.85 0.15	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	12.46 37.00	-4.39 4.39	83.93 0.16	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	12.68 37.00	-4.78 4.78	82.93 0.18	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	12.90 37.00	-5.17 5.17	81.84 0.19	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	13.11 37.00	-5.57 5.57	80.67 0.21	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	13.33 37.00	-5.96 5.96	79.41 0.23	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	13.55 37.00	-6.35 6.35	78.06 0.25	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	13.77 37.00	-6.74 6.74	76.63 0.27	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	13.99 37.00	-7.13 7.13	75.12 0.29	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	14.21 37.00	-7.52 7.52	73.52 0.32	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	14.43 37.00	-7.91 7.91	71.83 0.34	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	14.64 37.00	-8.30 8.30	70.06 0.37	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	14.86 37.00	-8.69 8.69	68.20 0.39	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	15.08 37.00	-9.08 9.08	66.26 0.42	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	15.30 37.00	-9.47 9.47	64.23 0.45	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	15.52 37.00	-9.86 9.86	62.12 0.49	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	15.74 37.00	-10.25 10.25	59.92 0.53	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	15.96 37.00	-10.64 10.64	57.64 0.57	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	16.17 37.00	-11.03 11.03	55.27 0.62	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	16.39 37.00	-11.42 11.42	52.82 0.67	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	16.61 37.00	-11.81 11.81	50.28 0.72	24.32	Vu < Phi*Vc / 2 Not Req'd per 9	24.3 0.0
1	+1.20D+1.60L	16.83 37.00	-12.20 12.20	47.65 0.79	24.41	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.0 18.5
1	+1.20D+1.60L	17.05 37.00	-12.59 12.59	44.94 0.86	24.53	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.1 18.5
1	+1.20D+1.60L	17.27 37.00	-12.99 12.99	42.15 0.95	24.67	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.2 18.5
1	+1.20D+1.60L	17.49 37.00	-13.38 13.38	39.27 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	17.70 37.00	-13.77 13.77	36.30 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	17.92 37.00	-14.16 14.16	33.25 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	18.14 37.00	-14.55 14.55	30.11 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	18.36 37.00	-14.94 14.94	26.89 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	18.58 37.00	-15.33 15.33	23.58 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	18.80 37.00	-15.72 15.72	20.19 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	19.02 37.00	-16.11 16.11	16.71 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	19.23 37.00	-16.50 16.50	13.15 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	19.45 37.00	-16.89 16.89	9.50 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	19.67 37.00	-17.28 17.28	5.76 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5
1	+1.20D+1.60L	19.89 37.00	-17.67 17.67	1.94 1.00	24.75	Phi*Vc / 2 < Vu <= Min per 9.6.3.	38.3 18.5

Maximum Forces & Stresses for Load Combinations

Load Combination Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
			Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	20.000	89.33	141.40	0.63
+1.40D					
Span # 1	1	20.000	57.56	141.40	0.41
+1.20D+1.60L					
Span # 1	1	20.000	89.33	141.40	0.63
+1.20D+L					
Span # 1	1	20.000	74.33	141.40	0.53
+1.20D					
Span # 1	1	20.000	49.33	141.40	0.35
+0.90D					
Span # 1	1	20.000	37.00	141.40	0.26

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
1	+D+L	0.0357	10.000		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

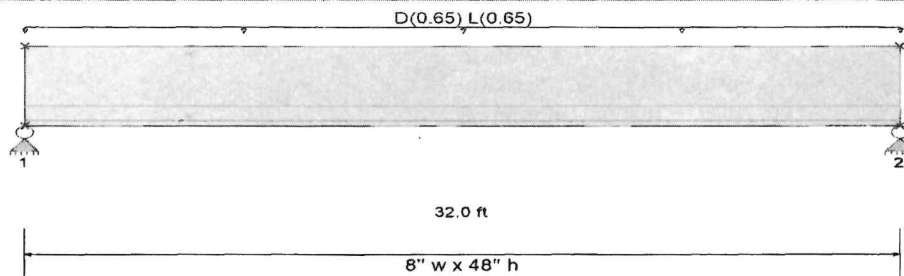
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-22 / IBC 2024

General Information

f_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 8.0 in, Height = 48.0 in

Span #1 Reinforcing....

2-#8 at 3.0 in from Bottom, from 0.0 to 32.0 ft in this span

2-#8 at 12.0 in from Bottom, from 0.0 to 32.0 ft in this span

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.650, L = 0.650 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.573 : 1
Section used for this span		Typical Section
Mu : Applied		292.351 k-ft
Mn * Phi : Allowable		509.83 k-ft
Location of maximum on span		15.971 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.067 in	Ratio =	5765 >=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360.0	L Only
Max Downward Total Deflection	0.377 in	Ratio =	1019 >=180.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0 <180.0	Span: 1 : +D+L

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	26.987	26.987
Max Upward from Load Combinations	26.987	26.987
Max Upward from Load Cases	16.587	16.587
D Only	16.587	16.587
+D+L	26.987	26.987
+D+0.750L	24.387	24.387
+0.60D	9.952	9.952

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
L Only	10.400	10.400

Shear Stirrup Requirements

Between 0.00 to 10.14 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 20.000 in
Between 10.20 to 21.80 ft, $V_u < \Phi^*V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
Between 21.86 to 31.94 ft, $\Phi^*V_c < V_u$, Req'd Vs = 5.331, use #3 stirrups spaced at 20.000 in

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	0.00 40.50	36.54 36.54	0.00 1.00	31.21	Phi*Vc < Vu 5.331	44.6 20.3
1	+1.20D+1.60L	0.35 40.50	35.75 35.75	12.64 1.00	31.21	Phi*Vc < Vu 4.532	44.6 20.3
1	+1.20D+1.60L	0.70 40.50	34.95 34.95	25.00 1.00	31.21	Phi*Vc < Vu 3.733	44.6 20.3
1	+1.20D+1.60L	1.05 40.50	34.15 34.15	37.08 1.00	31.21	Phi*Vc < Vu 2.934	44.6 20.3
1	+1.20D+1.60L	1.40 40.50	33.35 33.35	48.89 1.00	31.21	Phi*Vc < Vu 2.136	44.6 20.3
1	+1.20D+1.60L	1.75 40.50	32.55 32.55	60.41 1.00	31.21	Phi*Vc < Vu 1.337	44.6 20.3
1	+1.20D+1.60L	2.10 40.50	31.75 31.75	71.65 1.00	31.21	Phi*Vc < Vu 0.5380	44.6 20.3
1	+1.20D+1.60L	2.45 40.50	30.95 30.95	82.62 1.00	31.21	Phi*Vc / 2 < Vu <= Min per 9.6.3.	44.6 20.3
1	+1.20D+1.60L	2.80 40.50	30.15 30.15	93.30 1.00	31.21	Phi*Vc / 2 < Vu <= Min per 9.6.3.	44.6 20.3
1	+1.20D+1.60L	3.15 40.50	29.36 29.36	103.71 0.96	30.95	Phi*Vc / 2 < Vu <= Min per 9.6.3.	44.3 20.3
1	+1.20D+1.60L	3.50 40.50	28.56 28.56	113.84 0.85	30.30	Phi*Vc / 2 < Vu <= Min per 9.6.3.	43.7 20.3
1	+1.20D+1.60L	3.85 40.50	27.76 27.76	123.68 0.76	29.78	Phi*Vc / 2 < Vu <= Min per 9.6.3.	43.1 20.3
1	+1.20D+1.60L	4.20 40.50	26.96 26.96	133.25 0.68	29.33	Phi*Vc / 2 < Vu <= Min per 9.6.3.	42.7 20.3
1	+1.20D+1.60L	4.55 40.50	26.16 26.16	142.54 0.62	28.96	Phi*Vc / 2 < Vu <= Min per 9.6.3.	42.3 20.3
1	+1.20D+1.60L	4.90 40.50	25.36 25.36	151.55 0.56	28.63	Phi*Vc / 2 < Vu <= Min per 9.6.3.	42.0 20.3
1	+1.20D+1.60L	5.25 40.50	24.56 24.56	160.28 0.52	28.35	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.7 20.3
1	+1.20D+1.60L	5.60 40.50	23.76 23.76	168.73 0.48	28.10	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.5 20.3
1	+1.20D+1.60L	5.95 40.50	22.96 22.96	176.90 0.44	27.88	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.2 20.3
1	+1.20D+1.60L	6.30 40.50	22.17 22.17	184.79 0.40	27.69	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.1 20.3
1	+1.20D+1.60L	6.64 40.50	21.37 21.37	192.40 0.37	27.51	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.9 20.3
1	+1.20D+1.60L	6.99 40.50	20.57 20.57	199.74 0.35	27.35	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.7 20.3
1	+1.20D+1.60L	7.34 40.50	19.77 19.77	206.79 0.32	27.20	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.6 20.3
1	+1.20D+1.60L	7.69 40.50	18.97 18.97	213.57 0.30	27.06	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.4 20.3
1	+1.20D+1.60L	8.04 40.50	18.17 18.17	220.06 0.28	26.94	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.3 20.3
1	+1.20D+1.60L	8.39 40.50	17.37 17.37	226.28 0.26	26.82	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.2 20.3
1	+1.20D+1.60L	8.74 40.50	16.57 16.57	232.21 0.24	26.72	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.1 20.3
1	+1.20D+1.60L	9.09 40.50	15.78 15.78	237.87 0.22	26.62	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.0 20.3

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	9.44 40.50	14.98 14.98	243.25 0.21	26.62	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.0 20.3
1	+1.20D+1.60L	9.79 40.50	14.18 14.18	248.35 0.19	26.62	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.0 20.3
1	+1.20D+1.60L	10.14 40.50	13.38 13.38	253.16 0.18	26.62	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.0 20.3
1	+1.20D+1.60L	10.49 40.50	12.58 12.58	257.70 0.16	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	10.84 40.50	11.78 11.78	261.96 0.15	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	11.19 40.50	10.98 10.98	265.94 0.14	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	11.54 40.50	10.18 10.18	269.65 0.13	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	11.89 40.50	9.39 9.39	273.07 0.12	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	12.24 40.50	8.59 8.59	276.21 0.10	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	12.59 40.50	7.79 7.79	279.07 0.09	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	12.94 40.50	6.99 6.99	281.66 0.08	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	13.29 40.50	6.19 6.19	283.96 0.07	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	13.64 40.50	5.39 5.39	285.99 0.06	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	13.99 40.50	4.59 4.59	287.73 0.05	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	14.34 40.50	3.79 3.79	289.20 0.04	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	14.69 40.50	3.00 3.00	290.39 0.03	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	15.04 40.50	2.20 2.20	291.30 0.03	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	15.39 40.50	1.40 1.40	291.92 0.02	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	15.74 40.50	0.60 0.60	292.27 0.01	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	16.09 40.50	-0.20 0.20	292.34 0.00	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	16.44 40.50	-1.00 1.00	292.13 0.01	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	16.79 40.50	-1.80 1.80	291.64 0.02	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	17.14 40.50	-2.60 2.60	290.88 0.03	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	17.49 40.50	-3.39 3.39	289.83 0.04	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	17.84 40.50	-4.19 4.19	288.50 0.05	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	18.19 40.50	-4.99 4.99	286.90 0.06	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	18.54 40.50	-5.79 5.79	285.01 0.07	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	18.89 40.50	-6.59 6.59	282.85 0.08	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	19.23 40.50	-7.39 7.39	280.40 0.09	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	19.58 40.50	-8.19 8.19	277.68 0.10	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	19.93 40.50	-8.99 8.99	274.67 0.11	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	20.28 40.50	-9.79 9.79	271.39 0.12	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	20.63 40.50	-10.58 10.58	267.83 0.13	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	20.98 40.50	-11.38 11.38	263.99 0.15	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	21.33 40.50	-12.18 12.18	259.87 0.16	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	21.68 40.50	-12.98 12.98	255.47 0.17	26.62	Vu < Phi*Vc / 2 Not Req'd per 9	26.6 0.0
1	+1.20D+1.60L	22.03 40.50	-13.78 13.78	250.79 0.19	26.62	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.0 20.3
1	+1.20D+1.60L	22.38 40.50	-14.58 14.58	245.83 0.20	26.62	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.0 20.3
1	+1.20D+1.60L	22.73 40.50	-15.38 15.38	240.59 0.22	26.62	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.0 20.3
1	+1.20D+1.60L	23.08 40.50	-16.18 16.18	235.08 0.23	26.66	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.0 20.3
1	+1.20D+1.60L	23.43 40.50	-16.97 16.97	229.28 0.25	26.77	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.1 20.3
1	+1.20D+1.60L	23.78 40.50	-17.77 17.77	223.20 0.27	26.88	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.2 20.3
1	+1.20D+1.60L	24.13 40.50	-18.57 18.57	216.85 0.29	27.00	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.4 20.3
1	+1.20D+1.60L	24.48 40.50	-19.37 19.37	210.21 0.31	27.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.5 20.3
1	+1.20D+1.60L	24.83 40.50	-20.17 20.17	203.30 0.33	27.27	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.6 20.3
1	+1.20D+1.60L	25.18 40.50	-20.97 20.97	196.11 0.36	27.43	Phi*Vc / 2 < Vu <= Min per 9.6.3.	40.8 20.3
1	+1.20D+1.60L	25.53 40.50	-21.77 21.77	188.63 0.39	27.60	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.0 20.3
1	+1.20D+1.60L	25.88 40.50	-22.57 22.57	180.88 0.42	27.78	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.1 20.3
1	+1.20D+1.60L	26.23 40.50	-23.36 23.36	172.85 0.46	27.99	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.4 20.3
1	+1.20D+1.60L	26.58 40.50	-24.16 24.16	164.54 0.50	28.22	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.6 20.3
1	+1.20D+1.60L	26.93 40.50	-24.96 24.96	155.95 0.54	28.49	Phi*Vc / 2 < Vu <= Min per 9.6.3.	41.9 20.3
1	+1.20D+1.60L	27.28 40.50	-25.76 25.76	147.08 0.59	28.79	Phi*Vc / 2 < Vu <= Min per 9.6.3.	42.2 20.3
1	+1.20D+1.60L	27.63 40.50	-26.56 26.56	137.93 0.65	29.14	Phi*Vc / 2 < Vu <= Min per 9.6.3.	42.5 20.3
1	+1.20D+1.60L	27.98 40.50	-27.36 27.36	128.50 0.72	29.55	Phi*Vc / 2 < Vu <= Min per 9.6.3.	42.9 20.3
1	+1.20D+1.60L	28.33 40.50	-28.16 28.16	118.80 0.80	30.03	Phi*Vc / 2 < Vu <= Min per 9.6.3.	43.4 20.3
1	+1.20D+1.60L	28.68 40.50	-28.96 28.96	108.81 0.90	30.61	Phi*Vc / 2 < Vu <= Min per 9.6.3.	44.0 20.3
1	+1.20D+1.60L	29.03 40.50	-29.75 29.75	98.54 1.00	31.21	Phi*Vc / 2 < Vu <= Min per 9.6.3.	44.6 20.3
1	+1.20D+1.60L	29.38 40.50	-30.55 30.55	88.00 1.00	31.21	Phi*Vc / 2 < Vu <= Min per 9.6.3.	44.6 20.3
1	+1.20D+1.60L	29.73 40.50	-31.35 31.35	77.17 1.00	31.21	Phi*Vc < Vu 0.1386	44.6 20.3
1	+1.20D+1.60L	30.08 40.50	-32.15 32.15	66.07 1.00	31.21	Phi*Vc < Vu 0.9374	44.6 20.3
1	+1.20D+1.60L	30.43 40.50	-32.95 32.95	54.68 1.00	31.21	Phi*Vc < Vu 1.736	44.6 20.3
1	+1.20D+1.60L	30.78 40.50	-33.75 33.75	43.02 1.00	31.21	Phi*Vc < Vu 2.535	44.6 20.3

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	31.13 40.50	-34.55 34.55	31.08 1.00	31.21	Phi*Vc < Vu 3.334	44.6 20.3
1	+1.20D+1.60L	31.48 40.50	-35.35 35.35	18.86 1.00	31.21	Phi*Vc < Vu 4.132	44.6 20.3
1	+1.20D+1.60L	31.83 40.50	-36.14 36.14	6.36 1.00	31.21	Phi*Vc < Vu 4.931	44.6 20.3

Maximum Forces & Stresses for Load Combinations

Load Combination Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
			Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	32.000	292.35	509.83	0.57
+1.40D					
Span # 1	1	32.000	185.77	509.83	0.36
+1.20D+1.60L					
Span # 1	1	32.000	292.35	509.83	0.57
+1.20D+L					
Span # 1	1	32.000	242.43	509.83	0.48
+1.20D					
Span # 1	1	32.000	159.23	509.83	0.31
+0.90D					
Span # 1	1	32.000	119.42	509.83	0.23

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.3767	16.000		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC#: KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

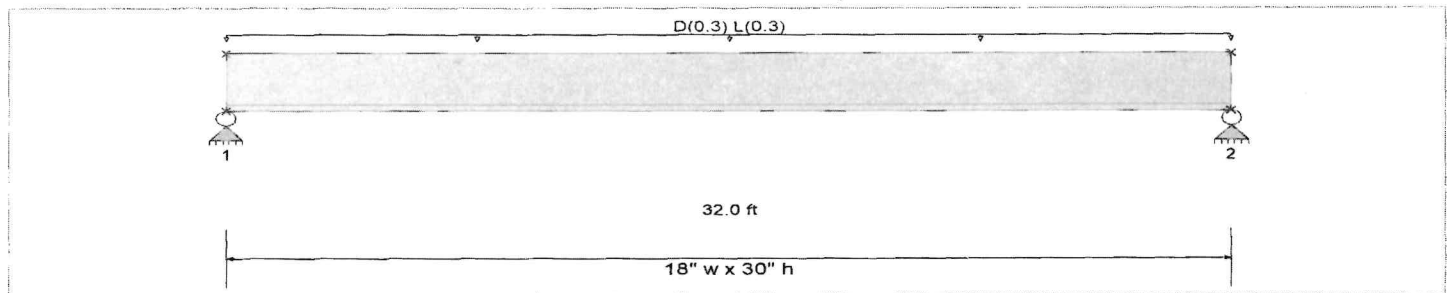
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-22 / IBC 2024

General Information

f_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 18.0 in, Height = 30.0 in

Span #1 Reinforcing....

5-#7 at 3.0 in from Bottom, from 0.0 to 32.0 ft in this span

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.30, L = 0.30 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.565 : 1
Section used for this span		Typical Section
Mu : Applied		191.039 k-ft
Mn * Phi : Allowable		338.029 k-ft
Location of maximum on span		15.971 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.056 in	Ratio =	6862	>=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	L Only
Max Downward Total Deflection	0.421 in	Ratio =	911	>=180.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<180.0	Span: 1 : +D+L

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	18.300	18.300
Max Upward from Load Combinations	18.300	18.300
Max Upward from Load Cases	13.500	13.500
D Only	13.500	13.500
+D+L	18.300	18.300
+D+0.750L	17.100	17.100
+0.60D	8.100	8.100

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
L Only	4.800	4.800

Shear Stirrup Requirements

Between 0.00 to 1.40 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in

Between 1.46 to 30.54 ft, $V_u < \Phi^*V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Between 30.60 to 31.94 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in

Detailed Shear Information

Span Number	Load Combination	Distance (ft)	Vu Actual	Mu (k-ft)	Φ^*V_c (k)	Comment	Φ^*V_n (k)
		'd' (in)	Vu (k) Design	d*Vu/Mu		Φ^*V_s (k)	Spacing (in) Req'd
1	+1.20D+1.60L	0.00	23.88	0.00	39.93	$\Phi^*V_c / 2 < V_u \leq$	59.7
		27.00	23.88	1.00		Min per 9.6.3.	9.8
1	+1.20D+1.60L	0.35	23.36	8.26	43.56	$\Phi^*V_c / 2 < V_u \leq$	63.4
		27.00	23.36	1.00		Min per 9.6.3.	9.8
1	+1.20D+1.60L	0.70	22.84	16.34	43.56	$\Phi^*V_c / 2 < V_u \leq$	63.4
		27.00	22.84	1.00		Min per 9.6.3.	9.8
1	+1.20D+1.60L	1.05	22.31	24.23	43.56	$\Phi^*V_c / 2 < V_u \leq$	63.4
		27.00	22.31	1.00		Min per 9.6.3.	9.8
1	+1.20D+1.60L	1.40	21.79	31.95	43.56	$\Phi^*V_c / 2 < V_u \leq$	63.4
		27.00	21.79	1.00		Min per 9.6.3.	9.8
1	+1.20D+1.60L	1.75	21.27	39.48	43.56	$V_u < \Phi^*V_c / 2$	43.6
		27.00	21.27	1.00		Not Req'd per 9	0.0
1	+1.20D+1.60L	2.10	20.75	46.82	43.54	$V_u < \Phi^*V_c / 2$	43.5
		27.00	20.75	1.00		Not Req'd per 9	0.0
1	+1.20D+1.60L	2.45	20.23	53.99	42.67	$V_u < \Phi^*V_c / 2$	42.7
		27.00	20.23	0.84		Not Req'd per 9	0.0
1	+1.20D+1.60L	2.80	19.70	60.97	42.02	$V_u < \Phi^*V_c / 2$	42.0
		27.00	19.70	0.73		Not Req'd per 9	0.0
1	+1.20D+1.60L	3.15	19.18	67.77	41.51	$V_u < \Phi^*V_c / 2$	41.5
		27.00	19.18	0.64		Not Req'd per 9	0.0
1	+1.20D+1.60L	3.50	18.66	74.39	41.11	$V_u < \Phi^*V_c / 2$	41.1
		27.00	18.66	0.56		Not Req'd per 9	0.0
1	+1.20D+1.60L	3.85	18.14	80.82	40.77	$V_u < \Phi^*V_c / 2$	40.8
		27.00	18.14	0.50		Not Req'd per 9	0.0
1	+1.20D+1.60L	4.20	17.62	87.07	40.49	$V_u < \Phi^*V_c / 2$	40.5
		27.00	17.62	0.46		Not Req'd per 9	0.0
1	+1.20D+1.60L	4.55	17.09	93.14	40.26	$V_u < \Phi^*V_c / 2$	40.3
		27.00	17.09	0.41		Not Req'd per 9	0.0
1	+1.20D+1.60L	4.90	16.57	99.03	40.05	$V_u < \Phi^*V_c / 2$	40.1
		27.00	16.57	0.38		Not Req'd per 9	0.0
1	+1.20D+1.60L	5.25	16.05	104.74	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	16.05	0.34		Not Req'd per 9	0.0
1	+1.20D+1.60L	5.60	15.53	110.26	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	15.53	0.32		Not Req'd per 9	0.0
1	+1.20D+1.60L	5.95	15.01	115.60	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	15.01	0.29		Not Req'd per 9	0.0
1	+1.20D+1.60L	6.30	14.48	120.75	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	14.48	0.27		Not Req'd per 9	0.0
1	+1.20D+1.60L	6.64	13.96	125.73	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	13.96	0.25		Not Req'd per 9	0.0
1	+1.20D+1.60L	6.99	13.44	130.52	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	13.44	0.23		Not Req'd per 9	0.0
1	+1.20D+1.60L	7.34	12.92	135.13	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	12.92	0.22		Not Req'd per 9	0.0
1	+1.20D+1.60L	7.69	12.40	139.56	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	12.40	0.20		Not Req'd per 9	0.0
1	+1.20D+1.60L	8.04	11.87	143.80	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	11.87	0.19		Not Req'd per 9	0.0
1	+1.20D+1.60L	8.39	11.35	147.86	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	11.35	0.17		Not Req'd per 9	0.0
1	+1.20D+1.60L	8.74	10.83	151.74	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	10.83	0.16		Not Req'd per 9	0.0
1	+1.20D+1.60L	9.09	10.31	155.44	39.93	$V_u < \Phi^*V_c / 2$	39.9
		27.00	10.31	0.15		Not Req'd per 9	0.0

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	9.44 27.00	9.79 9.79	158.95 0.14	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	9.79 27.00	9.26 9.26	162.28 0.13	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	10.14 27.00	8.74 8.74	165.43 0.12	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	10.49 27.00	8.22 8.22	168.40 0.11	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	10.84 27.00	7.70 7.70	171.18 0.10	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	11.19 27.00	7.18 7.18	173.78 0.09	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	11.54 27.00	6.66 6.66	176.20 0.08	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	11.89 27.00	6.13 6.13	178.44 0.08	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	12.24 27.00	5.61 5.61	180.49 0.07	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	12.59 27.00	5.09 5.09	182.36 0.06	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	12.94 27.00	4.57 4.57	184.05 0.06	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	13.29 27.00	4.05 4.05	185.56 0.05	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	13.64 27.00	3.52 3.52	186.88 0.04	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	13.99 27.00	3.00 3.00	188.02 0.04	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	14.34 27.00	2.48 2.48	188.98 0.03	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	14.69 27.00	1.96 1.96	189.76 0.02	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	15.04 27.00	1.44 1.44	190.35 0.02	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	15.39 27.00	0.91 0.91	190.76 0.01	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	15.74 27.00	0.39 0.39	190.99 0.00	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	16.09 27.00	-0.13 0.13	191.03 0.00	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	16.44 27.00	-0.65 0.65	190.90 0.01	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	16.79 27.00	-1.17 1.17	190.58 0.01	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	17.14 27.00	-1.70 1.70	190.08 0.02	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	17.49 27.00	-2.22 2.22	189.39 0.03	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	17.84 27.00	-2.74 2.74	188.52 0.03	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	18.19 27.00	-3.26 3.26	187.47 0.04	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	18.54 27.00	-3.78 3.78	186.24 0.05	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	18.89 27.00	-4.31 4.31	184.83 0.05	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	19.23 27.00	-4.83 4.83	183.23 0.06	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	19.58 27.00	-5.35 5.35	181.45 0.07	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	19.93 27.00	-5.87 5.87	179.49 0.07	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	20.28 27.00	-6.39 6.39	177.34 0.08	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	20.63 27.00	-6.92 6.92	175.02 0.09	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	20.98 27.00	-7.44 7.44	172.51 0.10	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	21.33 27.00	-7.96 7.96	169.81 0.11	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	21.68 27.00	-8.48 8.48	166.94 0.11	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	22.03 27.00	-9.00 9.00	163.88 0.12	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	22.38 27.00	-9.53 9.53	160.64 0.13	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	22.73 27.00	-10.05 10.05	157.22 0.14	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	23.08 27.00	-10.57 10.57	153.61 0.15	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	23.43 27.00	-11.09 11.09	149.82 0.17	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	23.78 27.00	-11.61 11.61	145.85 0.18	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	24.13 27.00	-12.14 12.14	141.70 0.19	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	24.48 27.00	-12.66 12.66	137.37 0.21	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	24.83 27.00	-13.18 13.18	132.85 0.22	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	25.18 27.00	-13.70 13.70	128.15 0.24	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	25.53 27.00	-14.22 14.22	123.26 0.26	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	25.88 27.00	-14.75 14.75	118.20 0.28	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	26.23 27.00	-15.27 15.27	112.95 0.30	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	26.58 27.00	-15.79 15.79	107.52 0.33	39.93	Vu < Phi*Vc / 2 Not Req'd per 9	39.9 0.0
1	+1.20D+1.60L	26.93 27.00	-16.31 16.31	101.91 0.36	39.96	Vu < Phi*Vc / 2 Not Req'd per 9	40.0 0.0
1	+1.20D+1.60L	27.28 27.00	-16.83 16.83	96.11 0.39	40.15	Vu < Phi*Vc / 2 Not Req'd per 9	40.1 0.0
1	+1.20D+1.60L	27.63 27.00	-17.36 17.36	90.13 0.43	40.37	Vu < Phi*Vc / 2 Not Req'd per 9	40.4 0.0
1	+1.20D+1.60L	27.98 27.00	-17.88 17.88	83.97 0.48	40.63	Vu < Phi*Vc / 2 Not Req'd per 9	40.6 0.0
1	+1.20D+1.60L	28.33 27.00	-18.40 18.40	77.63 0.53	40.93	Vu < Phi*Vc / 2 Not Req'd per 9	40.9 0.0
1	+1.20D+1.60L	28.68 27.00	-18.92 18.92	71.10 0.60	41.30	Vu < Phi*Vc / 2 Not Req'd per 9	41.3 0.0
1	+1.20D+1.60L	29.03 27.00	-19.44 19.44	64.39 0.68	41.75	Vu < Phi*Vc / 2 Not Req'd per 9	41.8 0.0
1	+1.20D+1.60L	29.38 27.00	-19.97 19.97	57.50 0.78	42.33	Vu < Phi*Vc / 2 Not Req'd per 9	42.3 0.0
1	+1.20D+1.60L	29.73 27.00	-20.49 20.49	50.43 0.91	43.07	Vu < Phi*Vc / 2 Not Req'd per 9	43.1 0.0
1	+1.20D+1.60L	30.08 27.00	-21.01 21.01	43.17 1.00	43.56	Vu < Phi*Vc / 2 Not Req'd per 9	43.6 0.0
1	+1.20D+1.60L	30.43 27.00	-21.53 21.53	35.73 1.00	43.56	Vu < Phi*Vc / 2 Not Req'd per 9	43.6 0.0
1	+1.20D+1.60L	30.78 27.00	-22.05 22.05	28.11 1.00	43.56	Phi*Vc / 2 < Vu <= Min per 9.6.3.	63.4 9.8

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	31.13 27.00	-22.58 22.58	20.31 1.00	43.56	Phi*Vc / 2 < Vu <= Min per 9.6.3.	63.4 9.8
1	+1.20D+1.60L	31.48 27.00	-23.10 23.10	12.32 1.00	43.56	Phi*Vc / 2 < Vu <= Min per 9.6.3.	63.4 9.8
1	+1.20D+1.60L	31.83 27.00	-23.62 23.62	4.15 1.00	43.56	Phi*Vc / 2 < Vu <= Min per 9.6.3.	63.4 9.8

Maximum Forces & Stresses for Load Combinations

Load Combination Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
			Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	32.000	191.04	338.03	0.57
+1.40D					
Span # 1	1	32.000	151.20	338.03	0.45
+1.20D+1.60L					
Span # 1	1	32.000	191.04	338.03	0.57
+1.20D+L					
Span # 1	1	32.000	168.00	338.03	0.50
+1.20D					
Span # 1	1	32.000	129.60	338.03	0.38
+0.90D					
Span # 1	1	32.000	97.20	338.03	0.29

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.4213	16.000		0.0000	0.000

Concrete Beam

Project File: ENERCALC_20

LIC#: KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

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DESCRIPTION: --None--

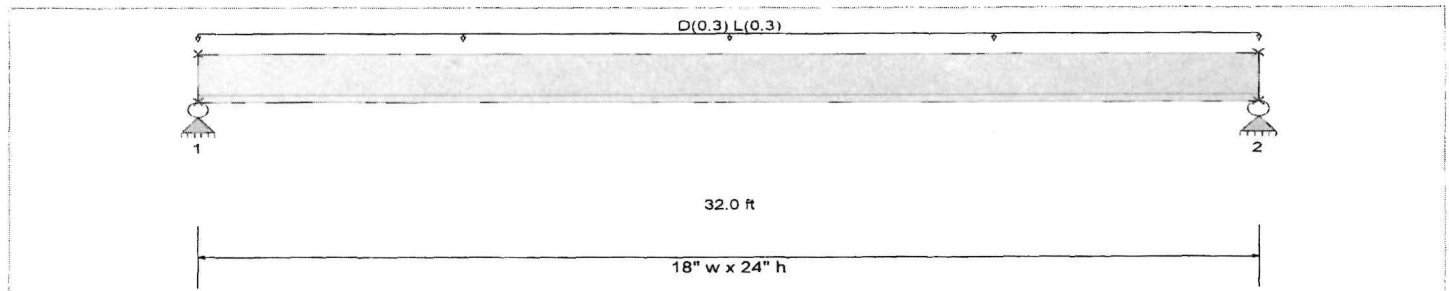
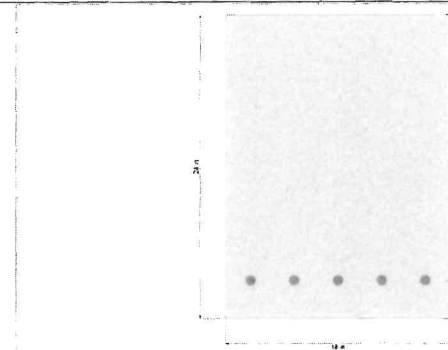
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-22 / IBC 2024

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 18.0 in, Height = 24.0 in

Span #1 Reinforcing....

5-#7 at 3.0 in from Bottom, from 0.0 to 32.0 ft in this span

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.30, L = 0.30 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.678 : 1
Section used for this span		Typical Section
Mu : Applied		174.335 k-ft
Mn * Phi : Allowable		257.029 k-ft
Location of maximum on span		15.971 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.109 in	Ratio =	3513 >=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360.0	L Only
Max Downward Total Deflection	0.904 in	Ratio =	425 >=180.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0 <180.0	Span: 1 : +D+L

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	16.560	16.560
Max Upward from Load Combinations	16.560	16.560
Max Upward from Load Cases	11.760	11.760
D Only	11.760	11.760
+D+L	16.560	16.560
+D+0.750L	15.360	15.360
+0.60D	7.056	7.056

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
L Only	4.800	4.800

Shear Stirrup Requirements

Between 0.00 to 4.49 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in

Between 4.55 to 27.45 ft, $V_u < \Phi^*V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Between 27.51 to 31.94 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	0.00 21.00	21.79 21.79	0.00 1.00	31.06	Phi*Vc / 2 < Vu <= Min per 9.6.3.	46.5 9.8
1	+1.20D+1.60L	0.35 21.00	21.32 21.32	7.54 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	0.70 21.00	20.84 20.84	14.91 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	1.05 21.00	20.36 20.36	22.11 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	1.40 21.00	19.89 19.89	29.15 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	1.75 21.00	19.41 19.41	36.02 0.94	34.81	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.2 9.8
1	+1.20D+1.60L	2.10 21.00	18.93 18.93	42.73 0.78	33.87	Phi*Vc / 2 < Vu <= Min per 9.6.3.	49.3 9.8
1	+1.20D+1.60L	2.45 21.00	18.46 18.46	49.27 0.66	33.19	Phi*Vc / 2 < Vu <= Min per 9.6.3.	48.6 9.8
1	+1.20D+1.60L	2.80 21.00	17.98 17.98	55.64 0.57	32.68	Phi*Vc / 2 < Vu <= Min per 9.6.3.	48.1 9.8
1	+1.20D+1.60L	3.15 21.00	17.51 17.51	61.84 0.50	32.29	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.7 9.8
1	+1.20D+1.60L	3.50 21.00	17.03 17.03	67.88 0.44	31.97	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.4 9.8
1	+1.20D+1.60L	3.85 21.00	16.55 16.55	73.76 0.39	31.71	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.1 9.8
1	+1.20D+1.60L	4.20 21.00	16.08 16.08	79.46 0.35	31.49	Phi*Vc / 2 < Vu <= Min per 9.6.3.	46.9 9.8
1	+1.20D+1.60L	4.55 21.00	15.60 15.60	85.00 0.32	31.31	Vu < Phi*Vc / 2 Not Req'd per 9	31.3 0.0
1	+1.20D+1.60L	4.90 21.00	15.12 15.12	90.37 0.29	31.15	Vu < Phi*Vc / 2 Not Req'd per 9	31.2 0.0
1	+1.20D+1.60L	5.25 21.00	14.65 14.65	95.58 0.27	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	5.60 21.00	14.17 14.17	100.62 0.25	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	5.95 21.00	13.69 13.69	105.49 0.23	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	6.30 21.00	13.22 13.22	110.20 0.21	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	6.64 21.00	12.74 12.74	114.74 0.19	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	6.99 21.00	12.27 12.27	119.11 0.18	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	7.34 21.00	11.79 11.79	123.31 0.17	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	7.69 21.00	11.31 11.31	127.35 0.16	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	8.04 21.00	10.84 10.84	131.23 0.14	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	8.39 21.00	10.36 10.36	134.93 0.13	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	8.74 21.00	9.88 9.88	138.47 0.12	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	9.09 21.00	9.41 9.41	141.85 0.12	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	9.44 21.00	8.93 8.93	145.05 0.11	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	9.79 21.00	8.45 8.45	148.09 0.10	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	10.14 21.00	7.98 7.98	150.97 0.09	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	10.49 21.00	7.50 7.50	153.67 0.09	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	10.84 21.00	7.03 7.03	156.21 0.08	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	11.19 21.00	6.55 6.55	158.59 0.07	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	11.54 21.00	6.07 6.07	160.80 0.07	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	11.89 21.00	5.60 5.60	162.84 0.06	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	12.24 21.00	5.12 5.12	164.71 0.05	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	12.59 21.00	4.64 4.64	166.42 0.05	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	12.94 21.00	4.17 4.17	167.96 0.04	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	13.29 21.00	3.69 3.69	169.33 0.04	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	13.64 21.00	3.22 3.22	170.54 0.03	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	13.99 21.00	2.74 2.74	171.58 0.03	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	14.34 21.00	2.26 2.26	172.46 0.02	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	14.69 21.00	1.79 1.79	173.16 0.02	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	15.04 21.00	1.31 1.31	173.71 0.01	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	15.39 21.00	0.83 0.83	174.08 0.01	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	15.74 21.00	0.36 0.36	174.29 0.00	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	16.09 21.00	-0.12 0.12	174.33 0.00	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	16.44 21.00	-0.60 0.60	174.21 0.01	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	16.79 21.00	-1.07 1.07	173.91 0.01	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	17.14 21.00	-1.55 1.55	173.46 0.02	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	17.49 21.00	-2.02 2.02	172.83 0.02	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	17.84 21.00	-2.50 2.50	172.04 0.03	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	18.19 21.00	-2.98 2.98	171.08 0.03	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	18.54 21.00	-3.45 3.45	169.96 0.04	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	18.89 21.00	-3.93 3.93	168.67 0.04	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	19.23 21.00	-4.41 4.41	167.21 0.05	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	19.58 21.00	-4.88 4.88	165.59 0.05	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	19.93 21.00	-5.36 5.36	163.79 0.06	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC#: KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	20.28 21.00	-5.84 5.84	161.84 0.06	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	20.63 21.00	-6.31 6.31	159.71 0.07	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	20.98 21.00	-6.79 6.79	157.42 0.08	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.33 21.00	-7.26 7.26	154.97 0.08	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.68 21.00	-7.74 7.74	152.34 0.09	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	22.03 21.00	-8.22 8.22	149.55 0.10	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	22.38 21.00	-8.69 8.69	146.59 0.10	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	22.73 21.00	-9.17 9.17	143.47 0.11	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	23.08 21.00	-9.65 9.65	140.18 0.12	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	23.43 21.00	-10.12 10.12	136.72 0.13	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	23.78 21.00	-10.60 10.60	133.10 0.14	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	24.13 21.00	-11.07 11.07	129.31 0.15	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	24.48 21.00	-11.55 11.55	125.35 0.16	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	24.83 21.00	-12.03 12.03	121.23 0.17	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	25.18 21.00	-12.50 12.50	116.94 0.19	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	25.53 21.00	-12.98 12.98	112.49 0.20	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	25.88 21.00	-13.46 13.46	107.86 0.22	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	26.23 21.00	-13.93 13.93	103.07 0.24	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	26.58 21.00	-14.41 14.41	98.12 0.26	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	26.93 21.00	-14.89 14.89	93.00 0.28	31.08	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	27.28 21.00	-15.36 15.36	87.71 0.31	31.23	Vu < Phi*Vc / 2 Not Req'd per 9	31.2 0.0
1	+1.20D+1.60L	27.63 21.00	-15.84 15.84	82.25 0.34	31.40	Phi*Vc / 2 < Vu <= Min per 9.6.3.	46.8 9.8
1	+1.20D+1.60L	27.98 21.00	-16.31 16.31	76.63 0.37	31.60	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.0 9.8
1	+1.20D+1.60L	28.33 21.00	-16.79 16.79	70.84 0.41	31.84	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.2 9.8
1	+1.20D+1.60L	28.68 21.00	-17.27 17.27	64.88 0.47	32.12	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.5 9.8
1	+1.20D+1.60L	29.03 21.00	-17.74 17.74	58.76 0.53	32.48	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.9 9.8
1	+1.20D+1.60L	29.38 21.00	-18.22 18.22	52.47 0.61	32.92	Phi*Vc / 2 < Vu <= Min per 9.6.3.	48.3 9.8
1	+1.20D+1.60L	29.73 21.00	-18.70 18.70	46.02 0.71	33.50	Phi*Vc / 2 < Vu <= Min per 9.6.3.	48.9 9.8
1	+1.20D+1.60L	30.08 21.00	-19.17 19.17	39.40 0.85	34.29	Phi*Vc / 2 < Vu <= Min per 9.6.3.	49.7 9.8
1	+1.20D+1.60L	30.43 21.00	-19.65 19.65	32.61 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	30.78 21.00	-20.12 20.12	25.65 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	31.13 21.00	-20.60 20.60	18.53 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	31.48 21.00	-21.08 21.08	11.24 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	31.83 21.00	-21.55 21.55	3.79 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8

Maximum Forces & Stresses for Load Combinations

Load Combination Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
			Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	32.000	174.34	257.03	0.68
+1.40D					
Span # 1	1	32.000	131.71	257.03	0.51
+1.20D+1.60L					
Span # 1	1	32.000	174.34	257.03	0.68
+1.20D+L					
Span # 1	1	32.000	151.30	257.03	0.59
+1.20D					
Span # 1	1	32.000	112.90	257.03	0.44
+0.90D					
Span # 1	1	32.000	84.67	257.03	0.33

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.9035	16.000		0.0000	0.000

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

Project File: ENERCALC_20

DESCRIPTION: --None--

Design Engineering & Supply Inc

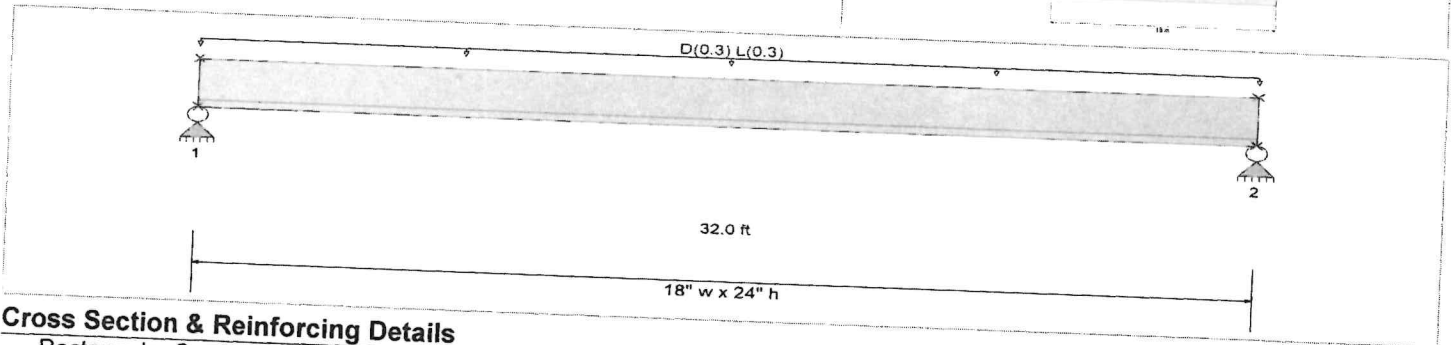
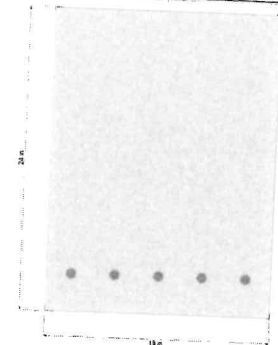
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CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019
 Load Combination Set : ASCE 7-22 / IBC 2024

General Information

f_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 18.0 in, Height = 24.0 in

Span #1 Reinforcing....

5-#7 at 3.0 in from Bottom, from 0.0 to 32.0 ft in this span

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.30, L = 0.30 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Maximum Bending Stress Ratio	=	0.678 : 1
Section used for this span		Typical Section
Mu : Applied		174.335 k-ft
Mn * Phi : Allowable		257.029 k-ft
Location of maximum on span		15.971 ft
Span # where maximum occurs		Span # 1

Design OK

Maximum Deflection

Max Downward Transient Deflection	0.109 in	Ratio =	3513 >= 360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0 < 360.0	L Only
Max Downward Total Deflection	0.904 in	Ratio =	425 >= 180.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0 < 180.0	Span: 1 : +D+L

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	16.560	16.560
Max Upward from Load Combinations	16.560	16.560
Max Upward from Load Cases	11.760	11.760
D Only	11.760	11.760
+D+L	11.760	11.760
+D+0.750L	16.560	16.560
+0.60D	15.360	15.360
	7.056	7.056

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

Project File: ENERCALC_20

DESCRIPTION: --None--

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

Vertical Reactions

Support notation : Far left is #1

Load Combination

Support 1 Support 2

L Only

4.800 4.800

Shear Stirrup Requirements

Between 0.00 to 4.49 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in
Between 4.55 to 27.45 ft, $V_u < \Phi^*V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
Between 27.51 to 31.94 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Φ^*V_c (k)	Comment Φ^*V_s (k)	Φ^*V_n (k) Spacing (in) Req'd
1	+1.20D+1.60L	0.00	21.79	0.00	31.06	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	46.5 9.8
1	+1.20D+1.60L	21.00	21.79	1.00			
		0.35	21.32	7.54	35.13	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	21.00	21.32	1.00			
		0.70	20.84	14.91	35.13	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	21.00	20.84	1.00			
		1.05	20.36	22.11	35.13	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	21.00	20.36	1.00			
		1.40	19.89	29.15	35.13	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	21.00	19.89	1.00			
		1.75	19.41	36.02	34.81	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	50.2 9.8
1	+1.20D+1.60L	21.00	19.41	0.94			
		2.10	18.93	42.73	33.87	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	49.3 9.8
1	+1.20D+1.60L	21.00	18.93	0.78			
		2.45	18.46	49.27	33.19	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	48.6 9.8
1	+1.20D+1.60L	21.00	18.46	0.66			
		2.80	17.98	55.64	32.68	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	48.1 9.8
1	+1.20D+1.60L	21.00	17.98	0.57			
		3.15	17.51	61.84	32.29	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	47.7 9.8
1	+1.20D+1.60L	21.00	17.51	0.50			
		3.50	17.03	67.88	31.97	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	47.4 9.8
1	+1.20D+1.60L	21.00	17.03	0.44			
		3.85	16.55	73.76	31.71	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	47.1 9.8
1	+1.20D+1.60L	21.00	16.55	0.39			
		4.20	16.08	79.46	31.49	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	46.9 9.8
1	+1.20D+1.60L	21.00	16.08	0.35			
		4.55	15.60	85.00	31.31	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.3 0.0
1	+1.20D+1.60L	21.00	15.60	0.32			
		4.90	15.12	90.37	31.15	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.2 0.0
1	+1.20D+1.60L	21.00	15.12	0.29			
		5.25	14.65	95.58	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	14.65	0.27			
		5.60	14.17	100.62	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	14.17	0.25			
		5.95	13.69	105.49	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	13.69	0.23			
		6.30	13.22	110.20	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	13.22	0.21			
		6.64	12.74	114.74	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	12.74	0.19			
		6.99	12.27	119.11	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	12.27	0.18			
		7.34	11.79	123.31	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	11.79	0.17			
		7.69	11.31	127.35	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	11.31	0.16			
		8.04	10.84	131.23	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	10.84	0.14			
		8.39	10.36	134.93	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	10.36	0.13			
		8.74	9.88	138.47	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	9.88	0.12			
		9.09	9.41	141.85	31.06	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.00	9.41	0.12			

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

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DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	9.44 21.00	8.93 8.93	145.05 0.11	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	9.79 21.00	8.45 8.45	148.09 0.10	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	10.14 21.00	7.98 7.98	150.97 0.09	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	10.49 21.00	7.50 7.50	153.67 0.09	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	10.84 21.00	7.03 7.03	156.21 0.08	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	11.19 21.00	6.55 6.55	158.59 0.07	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	11.54 21.00	6.07 6.07	160.80 0.07	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	11.89 21.00	5.60 5.60	162.84 0.06	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	12.24 21.00	5.12 5.12	164.71 0.05	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	12.59 21.00	4.64 4.64	166.42 0.05	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	12.94 21.00	4.17 4.17	167.96 0.04	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	13.29 21.00	3.69 3.69	169.33 0.04	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	13.64 21.00	3.22 3.22	170.54 0.03	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	13.99 21.00	2.74 2.74	171.58 0.03	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	14.34 21.00	2.26 2.26	172.46 0.02	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	14.69 21.00	1.79 1.79	173.16 0.02	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	15.04 21.00	1.31 1.31	173.71 0.01	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	15.39 21.00	0.83 0.83	174.08 0.01	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	15.74 21.00	0.36 0.36	174.29 0.00	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	16.09 21.00	-0.12 0.12	174.33 0.00	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	16.44 21.00	-0.60 0.60	174.21 0.01	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	16.79 21.00	-1.07 1.07	173.91 0.01	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	17.14 21.00	-1.55 1.55	173.46 0.02	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	17.49 21.00	-2.02 2.02	172.83 0.02	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	17.84 21.00	-2.50 2.50	172.04 0.03	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	18.19 21.00	-2.98 2.98	171.08 0.03	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	18.54 21.00	-3.45 3.45	169.96 0.04	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	18.89 21.00	-3.93 3.93	168.67 0.04	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	19.23 21.00	-4.41 4.41	167.21 0.05	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	19.58 21.00	-4.88 4.88	165.59 0.05	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	19.93 21.00	-5.36 5.36	163.79 0.06	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	20.28 21.00	-5.84 5.84	161.84 0.06	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	20.63 21.00	-6.31 6.31	159.71 0.07	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	20.98 21.00	-6.79 6.79	157.42 0.08	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.33 21.00	-7.26 7.26	154.97 0.08	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	21.68 21.00	-7.74 7.74	152.34 0.09	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	22.03 21.00	-8.22 8.22	149.55 0.10	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	22.38 21.00	-8.69 8.69	146.59 0.10	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	22.73 21.00	-9.17 9.17	143.47 0.11	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	23.08 21.00	-9.65 9.65	140.18 0.12	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	23.43 21.00	-10.12 10.12	136.72 0.13	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	23.78 21.00	-10.60 10.60	133.10 0.14	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	24.13 21.00	-11.07 11.07	129.31 0.15	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	24.48 21.00	-11.55 11.55	125.35 0.16	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	24.83 21.00	-12.03 12.03	121.23 0.17	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	25.18 21.00	-12.50 12.50	116.94 0.19	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	25.53 21.00	-12.98 12.98	112.49 0.20	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	25.88 21.00	-13.46 13.46	107.86 0.22	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	26.23 21.00	-13.93 13.93	103.07 0.24	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	26.58 21.00	-14.41 14.41	98.12 0.26	31.06	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	26.93 21.00	-14.89 14.89	93.00 0.28	31.08	Vu < Phi*Vc / 2 Not Req'd per 9	31.1 0.0
1	+1.20D+1.60L	27.28 21.00	-15.36 15.36	87.71 0.31	31.23	Vu < Phi*Vc / 2 Not Req'd per 9	31.2 0.0
1	+1.20D+1.60L	27.63 21.00	-15.84 15.84	82.25 0.34	31.40	Phi*Vc / 2 < Vu <= Min per 9.6.3.	46.8 9.8
1	+1.20D+1.60L	27.98 21.00	-16.31 16.31	76.63 0.37	31.60	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.0 9.8
1	+1.20D+1.60L	28.33 21.00	-16.79 16.79	70.84 0.41	31.84	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.2 9.8
1	+1.20D+1.60L	28.68 21.00	-17.27 17.27	64.88 0.47	32.12	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.5 9.8
1	+1.20D+1.60L	29.03 21.00	-17.74 17.74	58.76 0.53	32.48	Phi*Vc / 2 < Vu <= Min per 9.6.3.	47.9 9.8
1	+1.20D+1.60L	29.38 21.00	-18.22 18.22	52.47 0.61	32.92	Phi*Vc / 2 < Vu <= Min per 9.6.3.	48.3 9.8
1	+1.20D+1.60L	29.73 21.00	-18.70 18.70	46.02 0.71	33.50	Phi*Vc / 2 < Vu <= Min per 9.6.3.	48.9 9.8
1	+1.20D+1.60L	30.08 21.00	-19.17 19.17	39.40 0.85	34.29	Phi*Vc / 2 < Vu <= Min per 9.6.3.	49.7 9.8
1	+1.20D+1.60L	30.43 21.00	-19.65 19.65	32.61 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	30.78 21.00	-20.12 20.12	25.65 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	31.13 21.00	-20.60 20.60	18.53 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	31.48 21.00	-21.08 21.08	11.24 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8
1	+1.20D+1.60L	31.83 21.00	-21.55 21.55	3.79 1.00	35.13	Phi*Vc / 2 < Vu <= Min per 9.6.3.	50.5 9.8

Maximum Forces & Stresses for Load Combinations

Load Combination Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
			Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	32.000	174.34	257.03	0.68
+1.40D					
Span # 1	1	32.000	131.71	257.03	0.51
+1.20D+1.60L					
Span # 1	1	32.000	174.34	257.03	0.68
+1.20D+L					
Span # 1	1	32.000	151.30	257.03	0.59
+1.20D					
Span # 1	1	32.000	112.90	257.03	0.44
+0.90D					
Span # 1	1	32.000	84.67	257.03	0.33

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.9035	16.000		0.0000	0.000

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: --None--

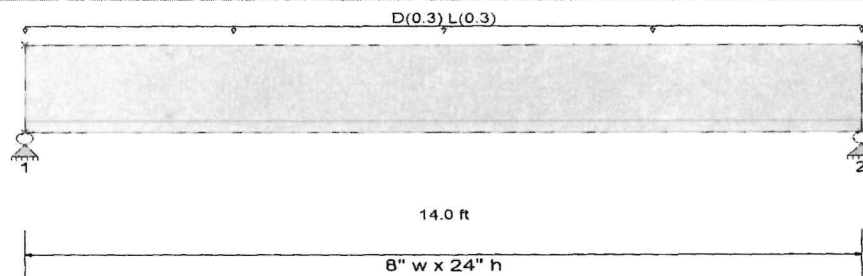
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-22 / IBC 2024

General Information

f_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 8.0 in, Height = 24.0 in

Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 14.0 ft in this span

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.30, L = 0.30 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.469 : 1
Section used for this span		Typical Section
Mu : Applied		26.264 k-ft
Mn * Phi : Allowable		56.046 k-ft
Location of maximum on span		6.987 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.009 in	Ratio =	18646	>=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	L Only
Max Downward Total Deflection	0.024 in	Ratio =	7051	>=180.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<180.0	Span: 1 : +D+L

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	5.553	5.553
Max Upward from Load Combinations	5.553	5.553
Max Upward from Load Cases	3.453	3.453
D Only	3.453	3.453
+D+L	5.553	5.553
+D+0.750L	5.028	5.028
+0.60D	2.072	2.072

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Vertical Reactions

Load Combination

Support notation : Far left is #1

L Only

Support 1 Support 2

2.100 2.100

Shear Stirrup Requirements

Between 0.00 to 0.33 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 10.000 in
Between 0.36 to 13.64 ft, $V_u < \Phi^*V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
Between 13.67 to 13.97 ft, $\Phi^*V_c / 2 < V_u \leq \Phi^*V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 10.000 in

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	V_u Actual V_u (k) Design	μ (k-ft) d^*V_u/μ	Φ^*V_c (k)	Comment Φ^*V_s (k)	Φ^*V_n (k) Req'd Spacing (in)
1	+1.20D+1.60L	0.00	7.50	0.00	14.27	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	28.1
1	+1.20D+1.60L	21.00	7.50	1.00	14.27	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	10.5
1	+1.20D+1.60L	0.15	7.34	1.14	14.27	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	28.1
1	+1.20D+1.60L	21.00	7.34	1.00	14.27	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	10.5
1	+1.20D+1.60L	0.31	7.18	2.25	14.27	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	28.1
1	+1.20D+1.60L	21.00	7.18	1.00	14.27	$\Phi^*V_c / 2 < V_u \leq$ Min per 9.6.3.	10.5
1	+1.20D+1.60L	0.46	7.01	3.33	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.3
1	+1.20D+1.60L	21.00	7.01	1.00	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	0.61	6.85	4.39	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.3
1	+1.20D+1.60L	21.00	6.85	1.00	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	0.77	6.68	5.43	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.3
1	+1.20D+1.60L	21.00	6.68	1.00	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	0.92	6.52	6.44	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.3
1	+1.20D+1.60L	21.00	6.52	1.00	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	1.07	6.36	7.42	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.3
1	+1.20D+1.60L	21.00	6.36	1.00	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	1.22	6.19	8.38	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.3
1	+1.20D+1.60L	21.00	6.19	1.00	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	1.38	6.03	9.32	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.3
1	+1.20D+1.60L	21.00	6.03	1.00	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	1.53	5.86	10.23	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.3
1	+1.20D+1.60L	21.00	5.86	1.00	14.27	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	1.68	5.70	11.11	14.16	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.2
1	+1.20D+1.60L	21.00	5.70	0.90	14.16	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	1.84	5.54	11.97	14.05	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.1
1	+1.20D+1.60L	21.00	5.54	0.81	14.05	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	1.99	5.37	12.81	13.97	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	14.0
1	+1.20D+1.60L	21.00	5.37	0.73	13.97	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	2.14	5.21	13.61	13.89	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.9
1	+1.20D+1.60L	21.00	5.21	0.67	13.89	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	2.30	5.04	14.40	13.83	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	5.04	0.61	13.83	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	2.45	4.88	15.16	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	4.88	0.56	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	2.60	4.72	15.89	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	4.72	0.52	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	2.75	4.55	16.60	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	4.55	0.48	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	2.91	4.39	17.29	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	4.39	0.44	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	3.06	4.22	17.94	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	4.22	0.41	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	3.21	4.06	18.58	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	4.06	0.38	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	3.37	3.90	19.19	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	3.90	0.36	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	3.52	3.73	19.77	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	3.73	0.33	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	3.67	3.57	20.33	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	3.57	0.31	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	3.83	3.40	20.86	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	3.40	0.29	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0
1	+1.20D+1.60L	3.98	3.24	21.37	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	13.8
1	+1.20D+1.60L	21.00	3.24	0.27	13.80	$V_u < \Phi^*V_c / 2$ Not Req'd per 9	0.0

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Req'd Spacing (in)
1	+1.20D+1.60L	4.13 21.00	3.08 3.08	21.85 0.25	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	4.28 21.00	2.91 2.91	22.31 0.23	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	4.44 21.00	2.75 2.75	22.74 0.21	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	4.59 21.00	2.58 2.58	23.15 0.20	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	4.74 21.00	2.42 2.42	23.53 0.18	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	4.90 21.00	2.26 2.26	23.89 0.17	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	5.05 21.00	2.09 2.09	24.22 0.15	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	5.20 21.00	1.93 1.93	24.53 0.14	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	5.36 21.00	1.76 1.76	24.81 0.12	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	5.51 21.00	1.60 1.60	25.07 0.11	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	5.66 21.00	1.44 1.44	25.30 0.10	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	5.81 21.00	1.27 1.27	25.51 0.09	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	5.97 21.00	1.11 1.11	25.69 0.08	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	6.12 21.00	0.94 0.94	25.85 0.06	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	6.27 21.00	0.78 0.78	25.98 0.05	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	6.43 21.00	0.62 0.62	26.09 0.04	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	6.58 21.00	0.45 0.45	26.17 0.03	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	6.73 21.00	0.29 0.29	26.23 0.02	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	6.89 21.00	0.12 0.12	26.26 0.01	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	7.04 21.00	-0.04 0.04	26.26 0.00	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	7.19 21.00	-0.21 0.21	26.24 0.01	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	7.34 21.00	-0.37 0.37	26.20 0.02	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	7.50 21.00	-0.53 0.53	26.13 0.04	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	7.65 21.00	-0.70 0.70	26.04 0.05	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	7.80 21.00	-0.86 0.86	25.92 0.06	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	7.96 21.00	-1.03 1.03	25.77 0.07	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	8.11 21.00	-1.19 1.19	25.60 0.08	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	8.26 21.00	-1.35 1.35	25.41 0.09	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	8.42 21.00	-1.52 1.52	25.19 0.11	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	8.57 21.00	-1.68 1.68	24.95 0.12	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	8.72 21.00	-1.85 1.85	24.68 0.13	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

LIC# : KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	8.87	-2.01	24.38			
1	+1.20D+1.60L	21.00	2.01	0.14	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	9.03	-2.17	24.06			
1	+1.20D+1.60L	21.00	2.17	0.16	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	9.18	-2.34	23.72			
1	+1.20D+1.60L	21.00	2.34	0.17	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	9.33	-2.50	23.35			
1	+1.20D+1.60L	21.00	2.50	0.19	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	9.49	-2.67	22.95			
1	+1.20D+1.60L	21.00	2.67	0.20	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	9.64	-2.83	22.53			
1	+1.20D+1.60L	21.00	2.83	0.22	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	9.79	-2.99	22.08			
1	+1.20D+1.60L	21.00	2.99	0.24	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	9.95	-3.16	21.61			
1	+1.20D+1.60L	21.00	3.16	0.26	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	10.10	-3.32	21.12			
1	+1.20D+1.60L	21.00	3.32	0.28	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	10.25	-3.49	20.60			
1	+1.20D+1.60L	21.00	3.49	0.30	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	10.40	-3.65	20.05			
1	+1.20D+1.60L	21.00	3.65	0.32	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	10.56	-3.81	19.48			
1	+1.20D+1.60L	21.00	3.81	0.34	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	10.71	-3.98	18.88			
1	+1.20D+1.60L	21.00	3.98	0.37	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	10.86	-4.14	18.26			
1	+1.20D+1.60L	21.00	4.14	0.40	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	11.02	-4.31	17.62			
1	+1.20D+1.60L	21.00	4.31	0.43	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	11.17	-4.47	16.95			
1	+1.20D+1.60L	21.00	4.47	0.46	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	11.32	-4.63	16.25			
1	+1.20D+1.60L	21.00	4.63	0.50	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	11.48	-4.80	15.53			
1	+1.20D+1.60L	21.00	4.80	0.54	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	11.63	-4.96	14.78			
1	+1.20D+1.60L	21.00	4.96	0.59	13.80	Vu < Phi*Vc / 2 Not Req'd per 9	13.8 0.0
1	+1.20D+1.60L	11.78	-5.13	14.01			
1	+1.20D+1.60L	21.00	5.13	0.64	13.86	Vu < Phi*Vc / 2 Not Req'd per 9	13.9 0.0
1	+1.20D+1.60L	11.93	-5.29	13.21			
1	+1.20D+1.60L	21.00	5.29	0.70	13.93	Vu < Phi*Vc / 2 Not Req'd per 9	13.9 0.0
1	+1.20D+1.60L	12.09	-5.45	12.39			
1	+1.20D+1.60L	21.00	5.45	0.77	14.01	Vu < Phi*Vc / 2 Not Req'd per 9	14.0 0.0
1	+1.20D+1.60L	12.24	-5.62	11.54			
1	+1.20D+1.60L	21.00	5.62	0.85	14.10	Vu < Phi*Vc / 2 Not Req'd per 9	14.1 0.0
1	+1.20D+1.60L	12.39	-5.78	10.67			
1	+1.20D+1.60L	21.00	5.78	0.95	14.21	Vu < Phi*Vc / 2 Not Req'd per 9	14.2 0.0
1	+1.20D+1.60L	12.55	-5.95	9.77			
1	+1.20D+1.60L	21.00	5.95	1.00	14.27	Vu < Phi*Vc / 2 Not Req'd per 9	14.3 0.0
1	+1.20D+1.60L	12.70	-6.11	8.85			
1	+1.20D+1.60L	21.00	6.11	1.00	14.27	Vu < Phi*Vc / 2 Not Req'd per 9	14.3 0.0
1	+1.20D+1.60L	12.85	-6.27	7.91			
1	+1.20D+1.60L	21.00	6.27	1.00	14.27	Vu < Phi*Vc / 2 Not Req'd per 9	14.3 0.0
1	+1.20D+1.60L	13.01	-6.44	6.93			
1	+1.20D+1.60L	21.00	6.44	1.00	14.27	Vu < Phi*Vc / 2 Not Req'd per 9	14.3 0.0
1	+1.20D+1.60L	13.16	-6.60	5.94			
1	+1.20D+1.60L	21.00	6.60	1.00	14.27	Vu < Phi*Vc / 2 Not Req'd per 9	14.3 0.0
1	+1.20D+1.60L	13.31	-6.77	4.91			
1	+1.20D+1.60L	21.00	6.77	1.00	14.27	Vu < Phi*Vc / 2 Not Req'd per 9	14.3 0.0
1	+1.20D+1.60L	13.46	-6.93	3.86			
1	+1.20D+1.60L	21.00	6.93	1.00	14.27	Vu < Phi*Vc / 2 Not Req'd per 9	14.3 0.0

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	13.62 21.00	-7.09 7.09	2.79 1.00	14.27	Vu < Phi*Vc / 2 Not Req'd per 9	14.3 0.0
1	+1.20D+1.60L	13.77 21.00	-7.26 7.26	1.69 1.00	14.27	Phi*Vc / 2 < Vu <= Min per 9.6.3.	28.1 10.5
1	+1.20D+1.60L	13.92 21.00	-7.42 7.42	0.57 1.00	14.27	Phi*Vc / 2 < Vu <= Min per 9.6.3.	28.1 10.5

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
				Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope						
+1.40D	Span # 1	1	14.000	26.26	56.05	0.47
+1.20D+1.60L	Span # 1	1	14.000	16.92	56.05	0.30
+1.20D+L	Span # 1	1	14.000	26.26	56.05	0.47
+1.20D	Span # 1	1	14.000	21.85	56.05	0.39
+0.90D	Span # 1	1	14.000	14.50	56.05	0.26
	Span # 1	1	14.000	10.88	56.05	0.19

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.0238	7.000		0.0000	0.000

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

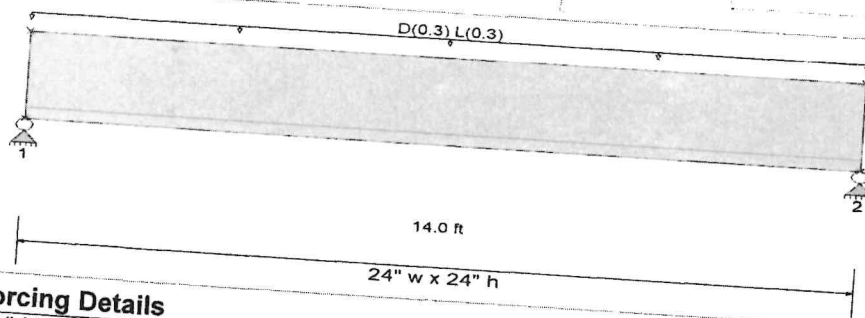
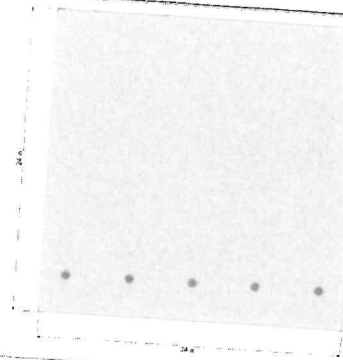
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CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019
Load Combination Set : ASCE 7-22 / IBC 2024

General Information

f_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 24.0 in, Height = 24.0 in
Span #1 Reinforcing....

5-#6 at 3.0 in from Bottom, from 0.0 to 14.0 ft in this span

Beam self weight calculated and added to loads
Load for Span Number 1

Uniform Load : D = 0.30, L = 0.30 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Maximum Bending Stress Ratio =	0.191 : 1
Section used for this span	Typical Section
Mu : Applied	37.632 k-ft
Mn * Phi : Allowable	197.224 k-ft
Location of maximum on span	6.987 ft
Span # where maximum occurs	Span # 1

Design OK

Maximum Deflection

Max Downward Transient Deflection	0.003 in	Ratio = 55940	>=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio = 0	<360.0	L Only
Max Downward Total Deflection	0.012 in	Ratio = 14222	>=180.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio = 0	<180.0	Span: 1 : +D+L

Vertical Reactions

Load Combination	Support 1	Support 2
x Upward from all Load Conditions	8.260	8.260
x Upward from Load Combinations	8.260	8.260
x Upward from Load Cases	6.160	6.160
only	6.160	6.160
-L	8.260	8.260
-0.750L	7.735	7.735
iod	3.696	3.696

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Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Vertical Reactions

Load Combination

Support notation : Far left is #1

L Only

Support 1 Support 2

2.100 2.100

Shear Stirrup Requirements

Entire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	V_u Actual V_u (k) Design	μ (k-ft) $d \cdot V_u / \mu$	ΦV_c (k)	Comment ΦV_s (k)	ΦV_n (k) Spacing (in) Req'd
1	+1.20D+1.60L	0.00	10.75	0.00			
1	+1.20D+1.60L	21.00	10.75	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	0.15	10.52	1.63			0.0
1	+1.20D+1.60L	21.00	10.52	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	0.31	10.28	3.22			0.0
1	+1.20D+1.60L	21.00	10.28	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	0.46	10.05	4.77			0.0
1	+1.20D+1.60L	21.00	10.05	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	0.61	9.81	6.29			0.0
1	+1.20D+1.60L	21.00	9.81	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	0.77	9.58	7.78			0.0
1	+1.20D+1.60L	21.00	9.58	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	0.92	9.34	9.22			0.0
1	+1.20D+1.60L	21.00	9.34	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	1.07	9.11	10.63			0.0
1	+1.20D+1.60L	21.00	9.11	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	1.22	8.87	12.01			0.0
1	+1.20D+1.60L	21.00	8.87	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	1.38	8.64	13.35			0.0
1	+1.20D+1.60L	21.00	8.64	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	1.53	8.40	14.65			0.0
1	+1.20D+1.60L	21.00	8.40	1.00	43.46	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.5
1	+1.20D+1.60L	1.68	8.17	15.92			0.0
1	+1.20D+1.60L	21.00	8.17	0.90	43.04	$V_u < \Phi V_c / 2$ Not Req'd per 9	43.0
1	+1.20D+1.60L	1.84	7.93	17.15			0.0
1	+1.20D+1.60L	21.00	7.93	0.81	42.68	$V_u < \Phi V_c / 2$ Not Req'd per 9	42.7
1	+1.20D+1.60L	1.99	7.70	18.35			0.0
1	+1.20D+1.60L	21.00	7.70	0.73	42.37	$V_u < \Phi V_c / 2$ Not Req'd per 9	42.4
1	+1.20D+1.60L	2.14	7.46	19.51			0.0
1	+1.20D+1.60L	21.00	7.46	0.67	42.10	$V_u < \Phi V_c / 2$ Not Req'd per 9	42.1
1	+1.20D+1.60L	2.30	7.23	20.63			0.0
1	+1.20D+1.60L	21.00	7.23	0.61	41.87	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.9
1	+1.20D+1.60L	2.45	6.99	21.72			0.0
1	+1.20D+1.60L	21.00	6.99	0.56	41.66	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.7
1	+1.20D+1.60L	2.60	6.76	22.77			0.0
1	+1.20D+1.60L	21.00	6.76	0.52	41.48	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.5
1	+1.20D+1.60L	2.75	6.52	23.79			0.0
1	+1.20D+1.60L	21.00	6.52	0.48	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	2.91	6.29	24.77			0.0
1	+1.20D+1.60L	21.00	6.29	0.44	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	3.06	6.05	25.71			0.0
1	+1.20D+1.60L	21.00	6.05	0.41	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	3.21	5.82	26.62			0.0
1	+1.20D+1.60L	21.00	5.82	0.38	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	3.37	5.58	27.49			0.0
1	+1.20D+1.60L	21.00	5.58	0.36	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	3.52	5.35	28.33			0.0
1	+1.20D+1.60L	21.00	5.35	0.33	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	3.67	5.11	29.13			0.0
1	+1.20D+1.60L	21.00	5.11	0.31	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	3.83	4.88	29.89			0.0
1	+1.20D+1.60L	21.00	4.88	0.29	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	3.98	4.64	30.62			0.0
1	+1.20D+1.60L	21.00	4.64	0.27	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4
1	+1.20D+1.60L	4.13	4.41	31.31			0.0
1	+1.20D+1.60L	21.00	4.41	0.25	41.41	$V_u < \Phi V_c / 2$ Not Req'd per 9	41.4

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Req'd Spacing (in)
1	+1.20D+1.60L	4.28	4.17	31.97			
		21.00	4.17	0.23	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	4.44	3.94	32.59			
		21.00	3.94	0.21	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	4.59	3.70	33.17			
		21.00	3.70	0.20	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	4.74	3.47	33.72			
		21.00	3.47	0.18	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	4.90	3.23	34.23			
		21.00	3.23	0.17	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	5.05	3.00	34.71			
		21.00	3.00	0.15	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	5.20	2.76	35.15			
		21.00	2.76	0.14	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	5.36	2.53	35.55			
		21.00	2.53	0.12	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	5.51	2.29	35.92			
		21.00	2.29	0.11	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	5.66	2.06	36.26			
		21.00	2.06	0.10	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	5.81	1.82	36.55			
		21.00	1.82	0.09	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	5.97	1.59	36.81			
		21.00	1.59	0.08	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	6.12	1.35	37.04			
		21.00	1.35	0.06	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	6.27	1.12	37.23			
		21.00	1.12	0.05	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	6.43	0.88	37.38			
		21.00	0.88	0.04	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	6.58	0.65	37.50			
		21.00	0.65	0.03	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	6.73	0.41	37.58			
		21.00	0.41	0.02	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	6.89	0.18	37.62			
		21.00	0.18	0.01	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	7.04	-0.06	37.63			
		21.00	0.06	0.00	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	7.19	-0.29	37.60			
		21.00	0.29	0.01	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	7.34	-0.53	37.54			
		21.00	0.53	0.02	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	7.50	-0.76	37.44			
		21.00	0.76	0.04	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	7.65	-1.00	37.31			
		21.00	1.00	0.05	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	7.80	-1.23	37.14			
		21.00	1.23	0.06	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	7.96	-1.47	36.93			
		21.00	1.47	0.07	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	8.11	-1.70	36.69			
		21.00	1.70	0.08	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	8.26	-1.94	36.41			
		21.00	1.94	0.09	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	8.42	-2.17	36.09			
		21.00	2.17	0.11	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	8.57	-2.41	35.74			
		21.00	2.41	0.12	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	8.72	-2.64	35.36			
		21.00	2.64	0.13	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	8.87	-2.88	34.93			
		21.00	2.88	0.14	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0

-51-

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Req'd Spacing (in)
1	+1.20D+1.60L	9.03	-3.11	34.48			
1	+1.20D+1.60L	21.00	3.11	0.16	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	9.18	-3.35	33.98			
1	+1.20D+1.60L	21.00	3.35	0.17	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	9.33	-3.58	33.45			
1	+1.20D+1.60L	21.00	3.58	0.19	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	9.49	-3.82	32.88			
1	+1.20D+1.60L	21.00	3.82	0.20	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	9.64	-4.05	32.28			
1	+1.20D+1.60L	21.00	4.05	0.22	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	9.79	-4.29	31.64			
1	+1.20D+1.60L	21.00	4.29	0.24	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	9.95	-4.52	30.97			
1	+1.20D+1.60L	21.00	4.52	0.26	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	10.10	-4.76	30.26			
1	+1.20D+1.60L	21.00	4.76	0.28	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	10.25	-4.99	29.51			
1	+1.20D+1.60L	21.00	4.99	0.30	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	10.40	-5.23	28.73			
1	+1.20D+1.60L	21.00	5.23	0.32	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	10.56	-5.46	27.91			
1	+1.20D+1.60L	21.00	5.46	0.34	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	10.71	-5.70	27.06			
1	+1.20D+1.60L	21.00	5.70	0.37	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	10.86	-5.93	26.17			
1	+1.20D+1.60L	21.00	5.93	0.40	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	11.02	-6.17	25.24			
1	+1.20D+1.60L	21.00	6.17	0.43	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	11.17	-6.40	24.28			
1	+1.20D+1.60L	21.00	6.40	0.46	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	11.32	-6.64	23.28			
1	+1.20D+1.60L	21.00	6.64	0.50	41.41	Vu < Phi*Vc / 2 Not Req'd per 9	41.4 0.0
1	+1.20D+1.60L	11.48	-6.87	22.25			
1	+1.20D+1.60L	21.00	6.87	0.54	41.57	Vu < Phi*Vc / 2 Not Req'd per 9	41.6 0.0
1	+1.20D+1.60L	11.63	-7.11	21.18			
1	+1.20D+1.60L	21.00	7.11	0.59	41.76	Vu < Phi*Vc / 2 Not Req'd per 9	41.8 0.0
1	+1.20D+1.60L	11.78	-7.34	20.07			
1	+1.20D+1.60L	21.00	7.34	0.64	41.98	Vu < Phi*Vc / 2 Not Req'd per 9	42.0 0.0
1	+1.20D+1.60L	11.93	-7.58	18.93			
1	+1.20D+1.60L	21.00	7.58	0.70	42.23	Vu < Phi*Vc / 2 Not Req'd per 9	42.2 0.0
1	+1.20D+1.60L	12.09	-7.81	17.75			
1	+1.20D+1.60L	21.00	7.81	0.77	42.51	Vu < Phi*Vc / 2 Not Req'd per 9	42.5 0.0
1	+1.20D+1.60L	12.24	-8.05	16.54			
1	+1.20D+1.60L	21.00	8.05	0.85	42.85	Vu < Phi*Vc / 2 Not Req'd per 9	42.9 0.0
1	+1.20D+1.60L	12.39	-8.28	15.29			
1	+1.20D+1.60L	21.00	8.28	0.95	43.25	Vu < Phi*Vc / 2 Not Req'd per 9	43.2 0.0
1	+1.20D+1.60L	12.55	-8.52	14.01			
1	+1.20D+1.60L	21.00	8.52	1.00	43.46	Vu < Phi*Vc / 2 Not Req'd per 9	43.5 0.0
1	+1.20D+1.60L	12.70	-8.75	12.68			
1	+1.20D+1.60L	21.00	8.75	1.00	43.46	Vu < Phi*Vc / 2 Not Req'd per 9	43.5 0.0
1	+1.20D+1.60L	12.85	-8.99	11.33			
1	+1.20D+1.60L	21.00	8.99	1.00	43.46	Vu < Phi*Vc / 2 Not Req'd per 9	43.5 0.0
1	+1.20D+1.60L	13.01	-9.22	9.93			
1	+1.20D+1.60L	21.00	9.22	1.00	43.46	Vu < Phi*Vc / 2 Not Req'd per 9	43.5 0.0
1	+1.20D+1.60L	13.16	-9.46	8.50			
1	+1.20D+1.60L	21.00	9.46	1.00	43.46	Vu < Phi*Vc / 2 Not Req'd per 9	43.5 0.0
1	+1.20D+1.60L	13.31	-9.69	7.04			
1	+1.20D+1.60L	21.00	9.69	1.00	43.46	Vu < Phi*Vc / 2 Not Req'd per 9	43.5 0.0
1	+1.20D+1.60L	13.46	-9.93	5.54			
1	+1.20D+1.60L	21.00	9.93	1.00	43.46	Vu < Phi*Vc / 2 Not Req'd per 9	43.5 0.0
1	+1.20D+1.60L	13.62	-10.16	4.00			
1	+1.20D+1.60L	21.00	10.16	1.00	43.46	Vu < Phi*Vc / 2 Not Req'd per 9	43.5 0.0

52

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

(c) ENERCALC, LLC 1982-2025

Detailed Shear Information

Span Number	Load Combination	Distance (ft) 'd' (in)	Vu Actual Vu (k) Design	Mu (k-ft) d*Vu/Mu	Phi*Vc (k)	Comment Phi*Vs (k)	Phi*Vn (k) Spacing (in) Req'd
1	+1.20D+1.60L	13.77	-10.40	2.43	43.46	Vu < Phi*Vc / 2	43.5
1	+1.20D+1.60L	21.00	10.40	1.00	43.46	Not Req'd per 9	0.0
		13.92	-10.63	0.82	43.46	Vu < Phi*Vc / 2	43.5
		21.00	10.63	1.00		Not Req'd per 9	0.0

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
				Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope						
Span # 1		1	14.000	37.63	197.22	0.19
+1.40D		1	14.000	30.18	197.22	0.15
Span # 1		1	14.000	37.63	197.22	0.19
+1.20D+1.60L		1	14.000	33.22	197.22	0.17
Span # 1		1	14.000	25.87	197.22	0.13
+1.20D+L		1	14.000	19.40	197.22	0.10
Span # 1						
+1.20D						
Span # 1						
+0.90D						
Span # 1						

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.0118	7.000		0.0000	0.000

designengineering & supply, Inc.

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Boca Raton, FL 33431

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Email: yemeniciler@netzero.net

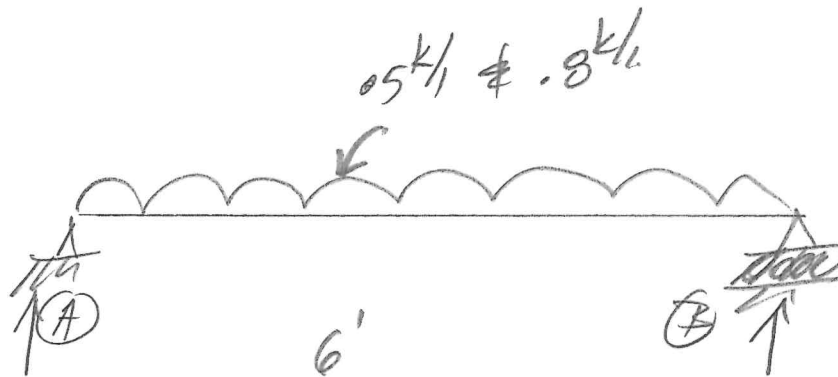
desupply@aol.com

Re: Bhagwansingh

8100 SW 120th Street.

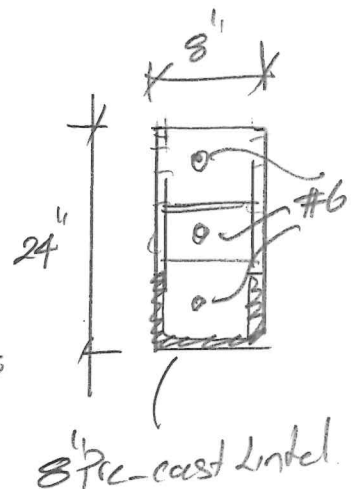
Pinecrest, FL

8" x 24"
w/ #6 T, M, B.



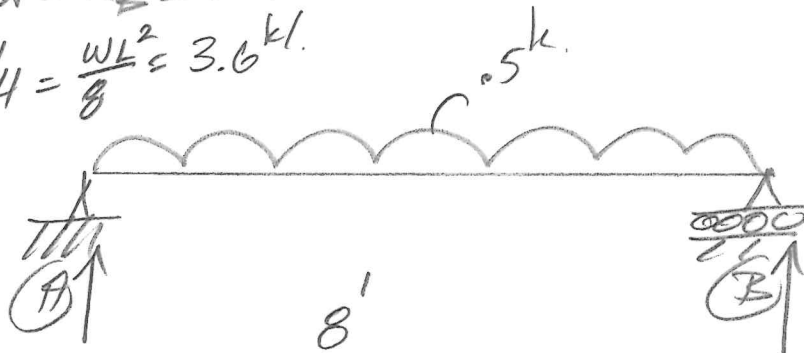
$$R_A = R_B = 2.4 \text{ k.}$$

$$M_4 = \frac{WL^2}{8} = 3.6 \text{ k-ft.}$$



(O.L.)

8" x 24"
w/ #6 T, M, B.



$$R_A = R_B = 2 \text{ k}$$

$$M_4 = 4 \text{ k-ft.}$$

O.L.

Best Regards,

(S3 A)

Ali N. Yemeniciler, MsCE., P.E
FL. Reg # 54733

"The Pressure's On Us."

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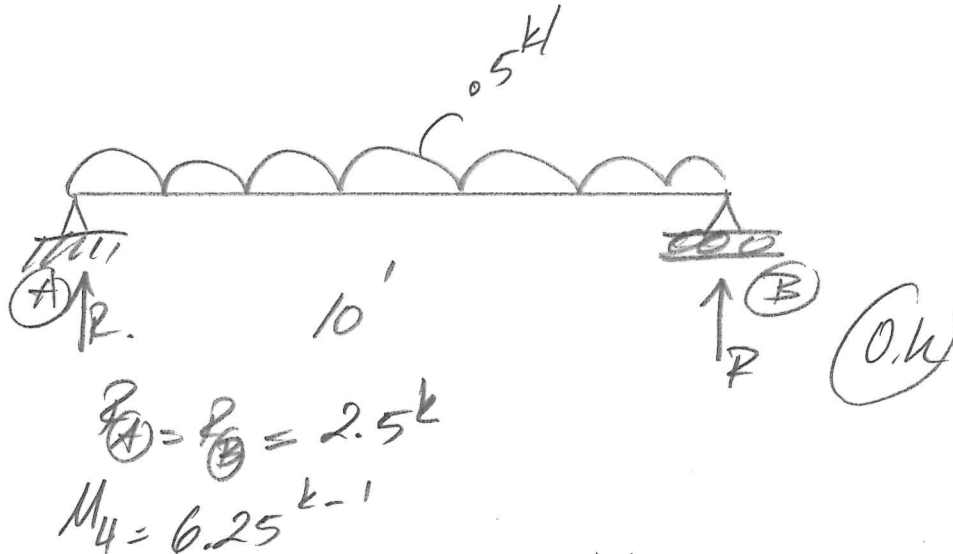
Boca Raton, FL 33431

P: 561-705-2930 F: 561-431-3211

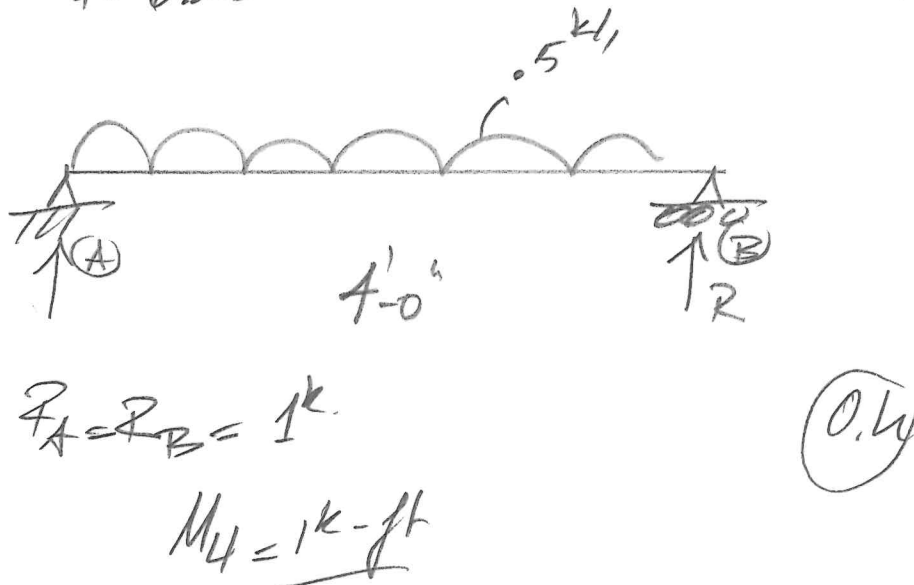
Email: yemeniciler@netzero.net

desupply@aol.com

8' x 24'
w/1#6, T.M.B



8' x 24'
1#6, T.M.B



Best Regards,

53A

Ali N. Yemeniciler, MsCE., P.E
FL. Reg # 54733

"The Pressure's On Us."

SPECIFICATIONS

PRODUCT DESCRIPTION

High strength precast and prestressed concrete lintels designed to be used unfilled or filled with grout to form a composite reinforced beam using concrete masonry units.

MATERIALS

- f'c 8" precast lintels = 3500 psi
- f'c 8" prestressed, 6" and 12" precast lintels = 6000 psi
- f'c 4" precast lintels = 3000 psi
- Grout per ASTM C476 f'g = 3000 psi w/maximum 3/8 inch aggregate and 8 to 11 inch slump.
- Concrete masonry units (CMU) per ASTM C90 with minimum net area compressive strength = 1900 psi
- Rebar per ASTM A615 Grade 60
- Prestressing strand per ASTM A416 Grade 270 low relaxation
- 7/32 inch wire per ASTM A510
- Mortar per ASTM C270 Type M or S

GENERAL NOTES

1. Provide full mortar head and bed joints.
2. Shore filled lintels as required.
3. Installation of lintel must comply with architectural and/or structural drawings.
4. U-Lintels are manufactured with 5-1/2 inch long notches at ends to accommodate vertical cell reinforcing and grouting.
5. All lintels meet or exceed L/360 vertical deflection, except lintels 17'-4" and longer with a nominal height of 8" meet or exceed L/180.
6. Bottom field added rebar to be located at the bottom of lintel cavity.
7. 7/32 inch diameter wire stirrups are welded to the bottom steel for mechanical anchorage.
8. Cast-in-place concrete may be provided in composite lintel in lieu of concrete masonry units.
9. Safe load ratings based on rational design analysis per ACI 318 and ACI 530
10. Product Approvals: Miami-Dade County, Florida Nos. 03-0605.05 and 03-0605.04. Florida Certificate of Product Approval No. FL158.
11. The exterior surface of lintels installed in exterior concrete masonry walls shall have a coating of stucco applied in accordance with ASTM C-926 or other approved coating.
12. Lintels loaded simultaneously with vertical (gravity or uplift) and horizontal (lateral) loads should be checked for the combined loading with the following equation:

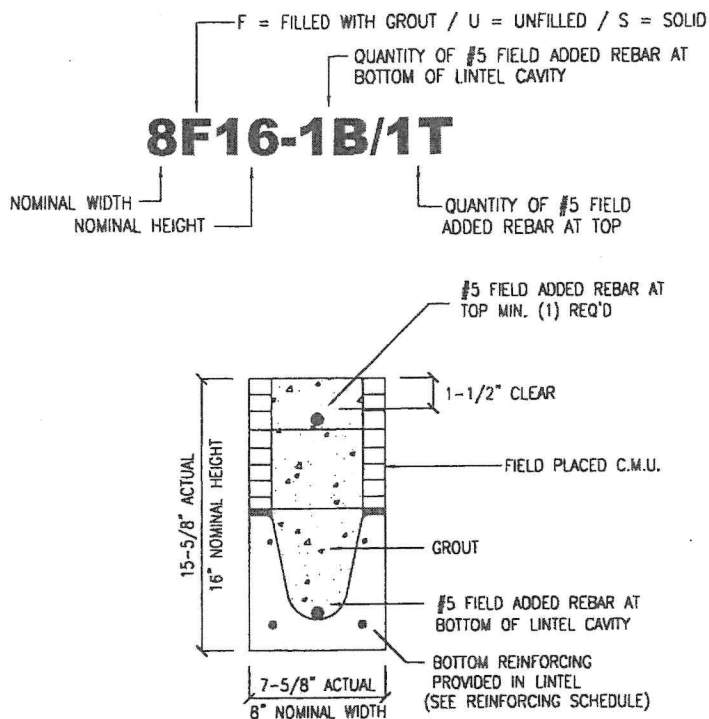
$$\frac{\text{Applied vertical load}}{\text{Safe vertical load}} + \frac{\text{Applied horizontal load}}{\text{Safe horizontal load}} \leq 1.0$$

SAFE LOAD TABLE NOTES

1. All values based on minimum 4 inch nominal bearing. Exception: Safe loads for unfilled lintels must be reduced by 20% if bearing length is less than 6-1/2 inches.
2. N.R. = Not Rated.
3. Safe loads are superimposed allowable load.
4. Safe loads based on Grade 40 or Grade 60 field rebar.
5. Additional lateral load capacity can be obtained by the designer by providing additional reinforced masonry above the precast lintel. See Reinforced CMU on Page 4.
6. One #7 rebar may be substituted for two #5 rebars in 8" lintels only.
7. The designer may evaluate concentrated loads from the safe load tables by calculating the maximum resisting moment and shear at d-away from the face of support.
8. For composite lintel heights not shown, use safe load from next lower height.
9. For lintel lengths not shown, use safe load from the next longest length shown.
10. All safe loads in units of pounds per linear foot.
11. All safe loads based on simply supported span.
12. The number in the parenthesis indicates the percent reduction for grade 40 field added rebar.
 Example: 7'6" lintel Type 8F32-1B safe gravity load = 6472 (15) w/15% reduction => 6472 (.85) = 5501 plf

HOW TO READ SAFE LOAD TABLES

TYPE DESIGNATION

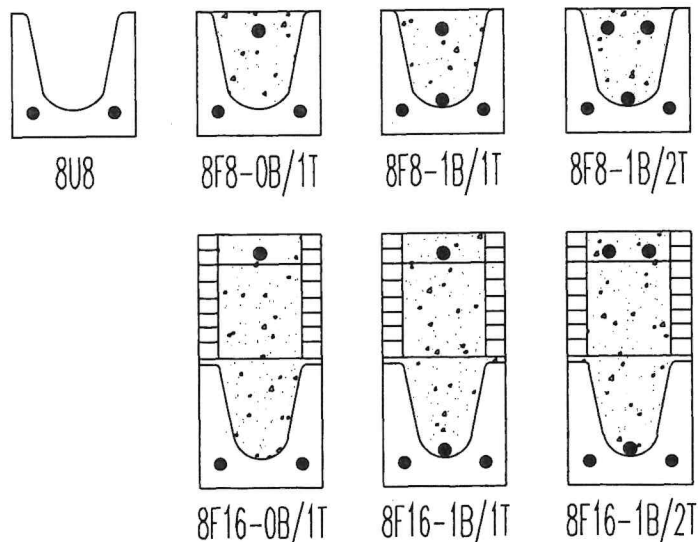


For a 5'-10 overall length lintel type 8F16-1B/1T:
 Safe superimposed gravity load = 4360 PLF
 Safe superimposed uplift load = 2093 PLF
 Safe superimposed lateral load = 339 PLF

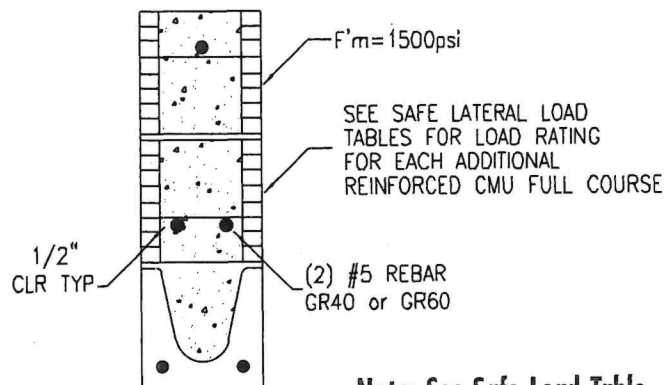
CAST-CRETE		GRAVITY			
LENGTH*	TYPE	8U8	8F8-OB	8F12-OB	8F16-OB
			8F8-1B	8F12-1B	8F16-1B
2'-10" (34")	PRECAST	2231	3069	4605	6113
			3069	4605	6113
3'-6" (42")	PRECAST	2231	3069	3719	5163
			3069	4605	6113
4'-0" (48")	PRECAST	1966	2561	2751	3820
			2693	4605	6113
4'-6" (54")	PRECAST	1599	1969	2110	2931
			2189	4375	6113
5'-4" (64")	PRECAST	1217	1349	1438	1999
			1663	3090	5365
5'-10" (70")	PRECAST	1062	1105	1173	1631
			1451	2622	4360
6'-6" (78")	PRECAST	908	1238	2177	3480
			1238	2177	3490

CAST-CRETE		UPLIFT			LATERAL		
LENGTH*	TYPE	8F8-1T	8F12-1T	8F16-1T	8U8	8F8	REINFC CMU
		8F8-2T	8F12-2T	8F16-2T			
2'-10" (34")	PRECAST	1972	3173	4460	1293	1642	2135
		1972	3173	4460			
3'-6" (42")	PRECAST	1569	2524	3547	1025	1024	1830
		1569	2524	3547			
4'-0" (48")	PRECAST	1363	2192	3079	765	763	1365
		1363	2192	3079			
4'-6" (54")	PRECAST	1207	1940	2774	592	591	1057
		1207	1940	2774			
5'-4" (64")	PRECAST	1016	1632	2290	411	411	734
		1016	1632	2290			
5'-10" (70")	PRECAST	909	1492	2093	340	339	607
		909	1492	2093			
6'-6" (78")	PRECAST	835 (112)	1340	1880	507	721	483
		835	1340	1880			

EXAMPLE COMPOSITE LINTEL TYPES



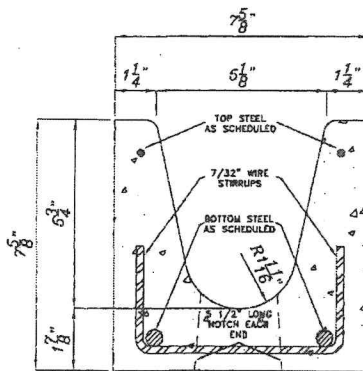
REINFORCED CMU



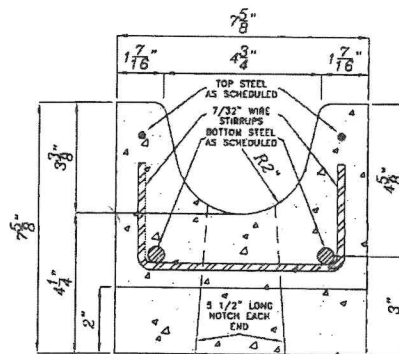
Note: See Safe Load Table Notes #5 for Application

OVERALL LENGTH		TOP STEEL		BOTTOM STEEL		OVERALL LENGTH		TOP STEEL		BOTTOM STEEL	
8" WIDE PRECAST U-LINTEL						6" WIDE PRECAST U-LINTEL					
2'-10" Thru	5'-10"	2	- 7/32" wire	2	- #3 rebar	3'-6" Thru	5'-10"	2	- 7/32" wire	2	- #3 rebar
5'-11" Thru	7'-6"	2	- 7/32" wire	2	- #4 rebar	5'-11" Thru	7'-6"	2	- 7/32" wire	2	- #4 rebar
7'-7" Thru	10'-6"	2	- #3 rebar	2	- #4 rebar	7'-7" Thru	10'-6"	2	- #3 rebar	2	- #4 rebar
10'-7" Thru	14'-0"	2	- #3 rebar	2	- #5 rebar	10'-7" Thru	17'-4"	2	- #3 rebar	2	- #5 rebar
8" WIDE PRESTRESSED U-LINTEL						12" WIDE PRECAST U-LINTEL					
14'-1" Thru	19'-4"	2	- 7/32" wire	2	- 7/16 strand	3'-6" Thru	7'-6"	2	- 7/32" wire	2	- #5 rebar
19'-5" Thru	24'-0"	2	- 7/32" wire	2	- 7/16 strand	7'-7" Thru	19'-4"	2	- #3 rebar	2	- #5 rebar
				and 2 - #4 rebar							
8" WIDE PRECAST RECESS U-LINTEL						4" WIDE PRECAST SOLID LINTEL					
4'-4" Thru	5'-10"	2	- 7/32" wire	2	- #3 rebar	3'-6" Thru	10'-6"	1	- #3 rebar	1	- #3 rebar
5'-11" Thru	9'-8"	2	- #3 rebar	2	- #4 rebar						

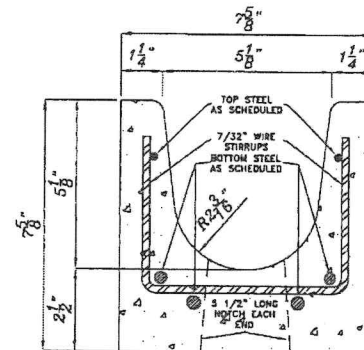
CROSS SECTIONS



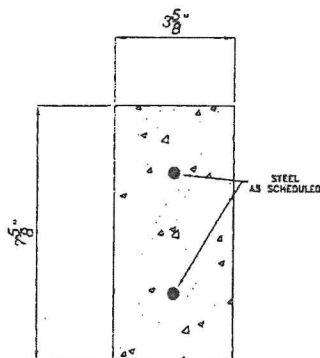
8" PRECAST



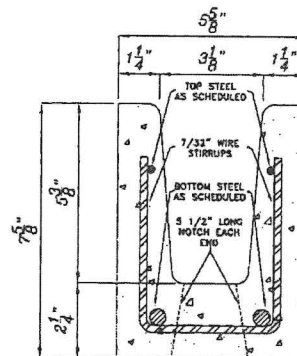
8" RECESS



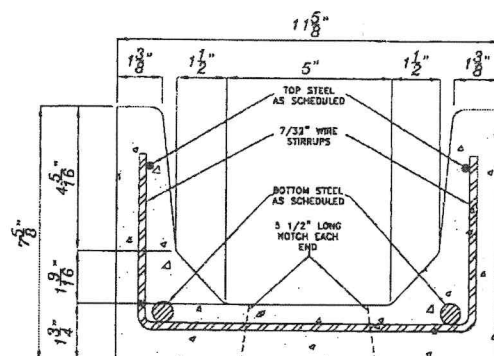
8" PRESTRESSED



4" SOLID



6" PRECAST



12" PRECAST

INSTALLATION OF COMPOSITE U LINTELS

Set precast lintel in full joints of mortar and shore as required. Place bottom field rebar on the floor of the lintel cavity, if required. Set additional courses of concrete masonry units to obtain composite height. Place top field rebar. Fill composite lintel with grout.

4 INCH LINTEL **SAFE LOADS (LBS/FT)**

CAST-CRETE			GRAVITY						
LENGTH*	TYPE	8U8	8F8-0B	8F12-0B	8F16-0B	8F20-0B	8F24-0B	8F28-0B	8F32-0B
			8F8-1B	8F12-1B	8F16-1B	8F20-1B	8F24-1B	8F28-1B	8F32-1B
2'-10" (34")	PRECAST	2231	3069	4605	6113	7547	8974	10394	11809
			3069	4605	6113	7547	8974	10394	11809
3'-6" (42")	PRECAST	2231	3069	3719	5163	6607	8054	9502	10951
			3069	4605	6113	7547	8974	10394	11809
4'-0" (48")	PRECAST	1966	2561	2751	3820	4890	5961	7034	8107
			2693	4605	6113	7547	8974	10394	11809
4'-6" (54")	PRECAST	1599	1969	2110	2931	3753	4576	5400	6224
			2189	4375	6113	7547 (7)	8672	10294	11809
5'-4" (64")	PRECAST	1217	1349	1438	1999	2560	3123	3686	4249
			1663	3090	5365	7547 (36)	7342 (19)	8733 (19)	10127 (19)
5'-10" (70")	PRECAST	1062	1105	1173	1631	2090	2549	3009	3470
			1451	2622	4360	7168 (45)	6036 (19)	7181 (19)	8328 (20)
6'-6" (78")	PRECAST	908	1238	2177	3480	3031	3707	4383	5061
			1238	2177	3480	5381	8360	10394 (37)	8825 (14)
7'-6" (90")	PRECAST	743	1011	1729	2632	2205	2698	3191	3685
			1011	1729	2661	3898	5681	8467 (44)	6472 (15)
9'-4" (112")	PRECAST	554	699	1160	1625	2564	3486	2818	3302
			752	1245	1843	2564	3486	4705 (37)	6390 (47)
10'-6" (126")	PRECAST	475	535	890	1247	2093	2777	2163	2536
			643	1052	1533	2093	2781	3643 (38)	4754 (45)
11'-4" (136")	PRECAST	362	582	945	1366	1846	2423	3127	4006
			582	945	1366	1846	2423	3127	4006
12'-0" (144")	PRECAST	337	540	873	1254	1684	2193	2805	3552
			540	873	1254	1684	2193	2805	3552
13'-4" (160")	PRECAST	296	471	755	1075	1428	1838	2316	2883
			471	755	1075	1428	1838	2316	2883
14'-0" (168")	PRECAST	279	424	706	1002	1326	1697	2127	2630
			442	706	1002	1326	1697	2127	2630
14'-8" (176")	PRESTRESSED	N.R.	NR	NR	NR	NR	NR	NR	NR
			458	783	1370	1902	2245	2517	2712
15'-4" (184")	PRESTRESSED	N.R.	NR	NR	NR	NR	NR	NR	NR
			412	710	1250	1733	2058	2320	2513
17'-4" (208")	PRESTRESSED	N.R.	NR	NR	NR	NR	NR	NR	NR
			300	548	950	1326	1609	1849	2047
19'-4" (232")	PRESTRESSED	N.R.	NR	NR	NR	NR	NR	NR	NR
			235	420	750	1037	1282	1515	1716
21'-4" (256")	PRESTRESSED	N.R.	NR	NR	NR	NR	NR	NR	NR
			180	340	598	845	1114	1359	1468
22'-0" (264")	PRESTRESSED	N.R.	NR	NR	NR	NR	NR	NR	NR
			165	315	550	784	1047	1285	1399
24'-0" (288")	PRESTRESSED	N.R.	NR	NR	NR	NR	NR	NR	NR
			129	250	450	654	884	1092	1222

designengineering & supply, Inc.

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Boca Raton, FL 33431

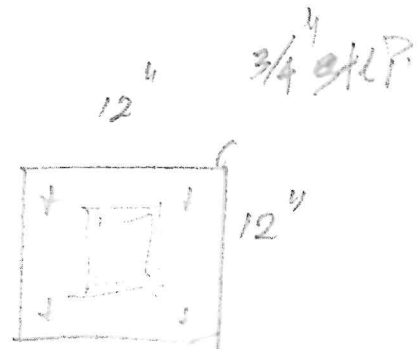
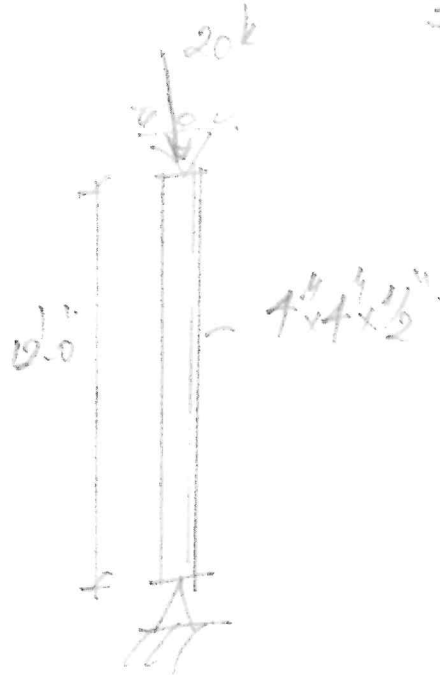
P: 561-705-2930 F: 561-431-3211

Email: yemeniciler@netzero.net

desupply@aol.com

Re: Phayansingh have
Pine crest, FL

Steel Column Calculations #
Bottom Plate Calculations



Best Regards,

Ali N. Yemeniciler, MsCE., P.E
FL. Reg # 54733

54/A

"The Pressure's On Us."

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Column

Project File: ENERCALC_20

LIC#: KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

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DESCRIPTION: --None--

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024

General Information

Steel Section Name : HSS4x4x1/2

Analysis Method : Allowable Strength

Steel Stress Grade

Fy : Steel Yield 36.0 ksi

E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 12. ft

Top & Bottom Fixity Top & Bottom Pinned

Brace condition :

Fully braced against buckling ABOUT X-X Axis

Fully braced against buckling ABOUT Y-Y Axis

Applied Loads

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

Column self weight included : 259.560 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 12.0 ft, D = 15.0, L = 15.0 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =

Load Combination

Location of max.above base

At maximum location values are . . .

Pa : Axial

Pn / Omega : Allowable

Ma-x : Applied

Mn-x / Omega : Allowable

Ma-y : Applied

Mn-y / Omega : Allowable

0.2332 : 1

+D+L

0.0 ft

30.260 k

129.772 k

0.0 k-ft

13.832 k-ft

0.0 k-ft

13.832 k-ft

Maximum Load Reactions . .

Top along X-X

0.0 k

Bottom along X-X

0.0 k

Top along Y-Y

0.0 k

Bottom along Y-Y

0.0 k

Maximum Load Deflections . . .

Along Y-Y 0.0 in at

0.0 ft above base

for load combination :

Along X-X 0.0 in at

0.0 ft above base

for load combination :

PASS Maximum Shear Stress Ratio

0.0 : 1

Load Combination

0.0

Location of max.above base

0.0 ft

At maximum location values are . . .

Va : Applied

0.0 k

Vn / Omega : Allowable

0.0 k

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cbz	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios			
	Stress Ratio	Status	Location						Stress Ratio	Status	Location	
D Only	0.118	PASS	0.00 ft		1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft	
+D+L	0.233	PASS	0.00 ft		1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft	
+D+0.750L	0.204	PASS	0.00 ft		1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft	
+0.60D	0.071	PASS	0.00 ft		1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft	

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction		X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
	@ Base		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
D Only	15.260											
+D+L	30.260											
+D+0.750L	26.510											
+0.60D	9.156											
L Only	15.000											

Extreme Reactions

Item	Extreme Value	Axial Reaction		X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Axial @ Base	Maximum	30.260											
"	Minimum	9.156											
Reaction, X-X Axis Base	Maximum	15.260											
"	Minimum	15.260											

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Steel Column

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

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DESCRIPTION: --None--

Extreme Reactions

Item	Extreme Value	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Reaction, Y-Y Axis Base	Maximum	15.260										
"	Minimum	15.260										
Reaction, X-X Axis Top	Maximum	15.260										
"	Minimum	15.260										
Reaction, Y-Y Axis Top	Maximum	15.260										
"	Minimum	15.260										
Moment, X-X Axis Base	Maximum	15.260										
"	Minimum	15.260										
Moment, Y-Y Axis Base	Maximum	15.260										
"	Minimum	15.260										
Moment, X-X Axis Top	Maximum	15.260										
"	Minimum	15.260										
Moment, Y-Y Axis Top	Maximum	15.260										
"	Minimum	15.260										

Maximum Deflections for Load Combinations

Load Combination	Max. Deflection in X dir	Distance	Max. Deflection in Y dir	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

Steel Section Properties : HSS4x4x1/2

Depth	=	4.000 in	I xx	=	11.90 in^4	J	=	21.000 in^4
Design Thick	=	0.465 in	S xx	=	5.97 in^3			
Width	=	4.000 in	R xx	=	1.410 in			
Wall Thick	=	0.500 in	Zx	=	7.700 in^3			
Area	=	6.020 in^2	I yy	=	11.900 in^4	C	=	11.200 in^3
Weight	=	21.630 plf	S yy	=	5.970 in^3			
			R yy	=	1.410 in			

Ycg = 0.000 in

55

Steel Column

Project File: ENERCALC_20

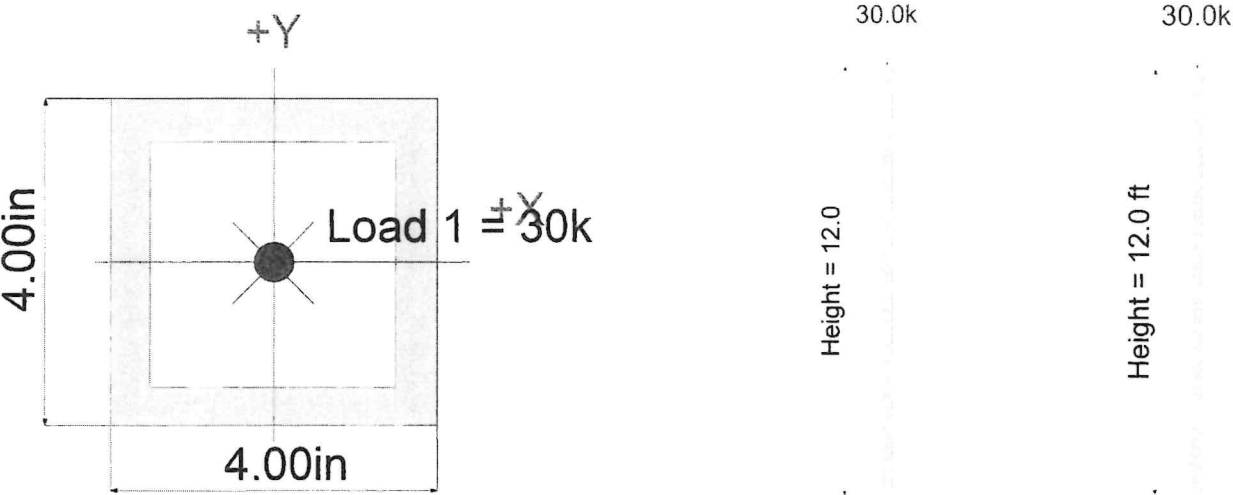
LIC# : KW-06015041, Build:20.25.04.16

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DESCRIPTION: --None--

Sketches



Steel Base Plate

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

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DESCRIPTION: --None--

Code Reference:

Calculations per AISC Design Guide # 1, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-22 / IBC 2024

General Information

Material Properties

AISC Design Method	Load Resistance Factor Design	ϕ_c : LRFD Resistance Factor	0.65
Steel Plate Fy	= 36 ksi		
Concrete Support fc	= 3 ksi		
Assumed Bearing Area	Full Bearing	Nominal Bearing Fp per J8	0.0 ksi

Column & Plate

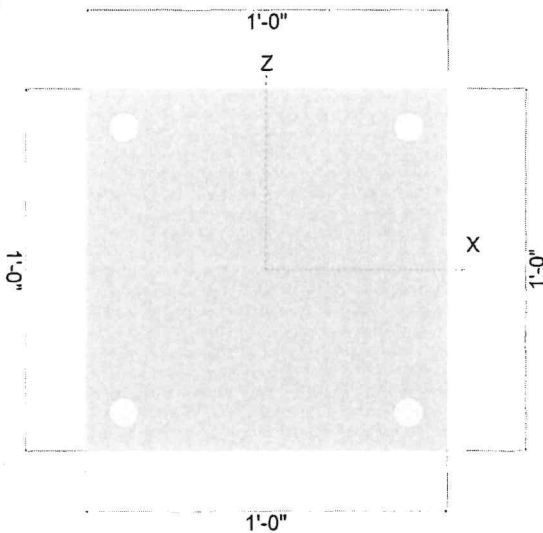
Column Properties

Steel Section			
Depth	in	Area	in^2
Width	in	Ixx	in^4
Flange Thickness	in	Iyy	in^4
Web Thickness	in		

Plate Dimensions

N : Length	12 in	Support Dimensions	
B : Width	12 in	Width along "X"	12 in
Thickness	0.750 in	Length along "Z"	12 in

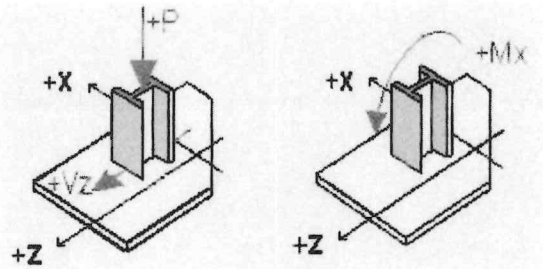
Column assumed welded to base plate



Applied Loads

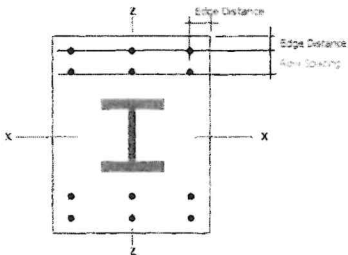
	P-Y	V-Z	M-X
D : Dead Load	20.0 k	k	k-ft
L : Live	10.0 k	k	k-ft
Lr : Roof Live	k	k	k-ft
S : Snow	k	k	k-ft
W : Wind	k	k	k-ft
E : Earthquake	k	k	k-ft
H : Lateral Earth	k	k	k-ft

"P" = Gravity load, "+" sign is downward
"V" = Shear, "+" sign is towards +Z edge
"M" = Moments create higher soil pressure at +Z edge
"X" = Shears push plate towards +Z edge



Anchor Bolts

Anchor Bolt or Rod Description	1 1/2"
Max of Tension or Pullout Capacity.....	k
Shear Capacity.....	k
Edge distance : bolt to plate.....	1.25 in
Number of Bolts in each Row.....	2
Number of Bolt Rows.....	1



Project Title:
Engineer:
Project ID:
Project Descr:

Steel Base Plate

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

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DESCRIPTION: --None--

GOVERNING DESIGN LOAD CASE SUMMARY

Plate Design Summary

Design Method Load Resistance Factor Design

Governing Load Combinat

Governing Load Case Typ

Governing STRESS RATIO 0.0

Design Plate Size 1'-0" x 1'-0" x 0 -3/4"

Pu : Axial 0.000 k

Mu : Moment 0.000 k-ft

Mu : Max. Moment 0.000 k-in

fb : Max. Bending Stress 0.000 ksi

Fb : Allowable : $F_y * \phi$ 0.000 ksi

Bending Stress Ratio 0.000

Bending Stress OK

fu : Max. Plate Bearing Stress 0.000 ksi

Fp : Allowable : 0.000 ksi

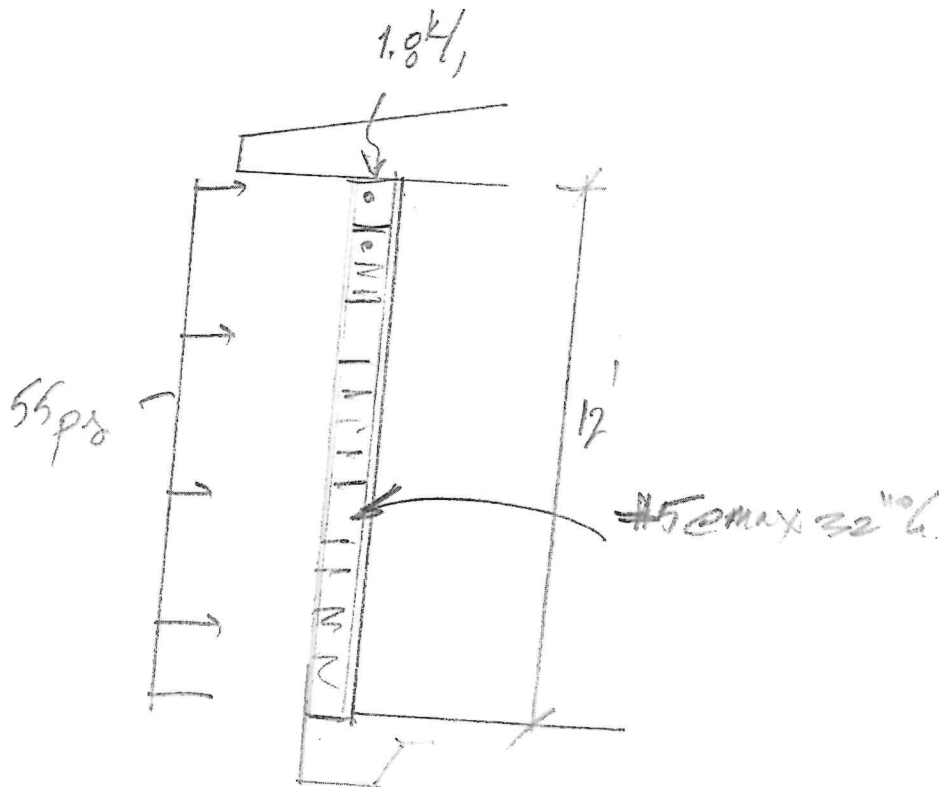
Bearing Stress Ratio 0.000

Bearing Stress OK

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2799 NW Boca Raton Blvd. #111
Boca Raton, FL 33431
P: 561-705-2930 F: 561-431-3211
Email: yemeniciler@netzero.net
desupply@aol.com

Re: Bhagwan Singh's house
Tinecrest, FL

Masonry Wall Calculations



Best Regards,

Ali N. Yemeniciler, MsCE., P.E
FL. Reg # 54733

59/A
"The Pressure's On Us."

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

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DESCRIPTION: --None--

Code References

Calculations per TMS 402-16, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024

General Information

Calculations per TMS 402-16, IBC 2018, CBC 2019

Construction Type : Grouted Hollow Concrete Masonry

F'm = 1.50 ksi

Fy - Yield = 60.0 ksi

Fr - Rupture = 61.0 psi

Em = f'm * = 900.0

Max % of ρ_{bal} = 0.006809

Grout Density = 140 pcf

Block Weight Normal Weight

Wall Weight = 51.0 psf

Wall is grouted at rebar cells only

Nom. Wall Thickness 8 in

Actual Thickness 7.625 in

Rebar "d" distance 3.750 in

Lower Level Rebar . . .

Bar Size # 5

Bar Spacing 32 in

Temp Diff across thickness = deg F

Min Allow Out-of-plane Defl R_z = 0.0

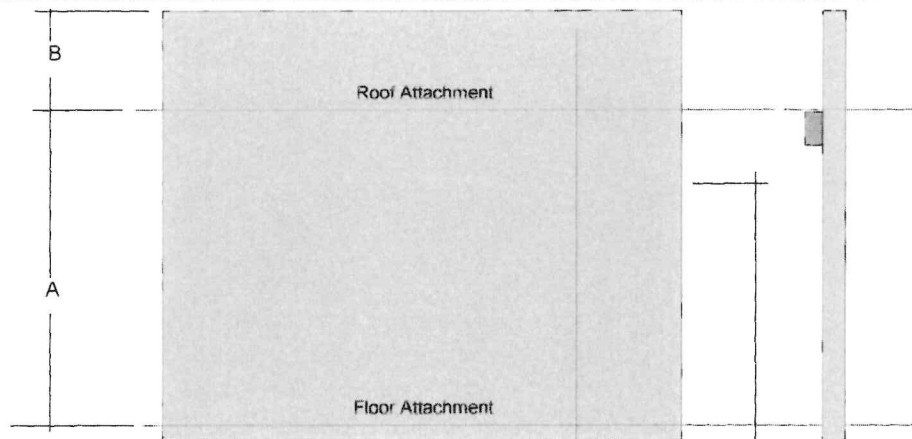
Minimum Vertical Steel % = 0.0020

One-Story Wall Dimensions

A Clear Height = 12.25 ft

B Parapet height = ft

Wall Support Condition Top & Bottom Pinned



Vertical Loads

Vertical Uniform Loads Applied per foot of Strip Width

Ledger Load Eccentricity 6.750 in

Concentric Load

DL : Dead

Lr : Roof Live

Lf : Floor Live

S : Snow

W : Wind

k/ft

k/ft

Lateral Loads

Wind Loads :

Full area WIND load 55. psf

Seismic Loads :

Wall Weight Seismic Load Input Method : Direct entry of Lateral Wall Weight

Seismic Wall Lateral Load 0. psf

Fp 1.0 = 0.0 psf

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

Masonry Slender Wall

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

Project File: ENERCALC_20

DESCRIPTION: --None--

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DESIGN SUMMARY

Governing Load Combination . . .		Results reported for "Strip Width" of 12.0 in			
		Actual Values . . .		Allowable Values . . .	
PASS	Moment Capacity Check +0.90D+W	Maximum Bending Stress Ratio.5304			
		Max Mu	1.075 k-ft	Phi * Mn	2.026 k-ft
PASS	Service Deflection Check W Only	Actual Defl. Ratio L/	272	Allowable Defl. Ratio	150.0
		Max. Deflection	0.5401 in		
PASS	Axial Load Check +1.20D+L+W	Max Pu / Ag	56.567 psi	Max. Allow. Defl.	0.980 in
	Reinforcing Limit Check	Location	5.921 ft	0.2 * f'm	300.0 psi
		Actual As/bd	0.00250	Max Allow As/bd	0.006810
Maximum Reactions for Load Combination...					
	Top Horizontal	W Only			0.3369 k
	Base Horizontal	W Only			0.3369 k
	Vertical Reaction	+D+L			2.625 k

Design Maximum Combinations - Moments

Load Combination	Axial Load			Results reported for "Strip Width" = 12 in.						
	Pu k	0.2*f _m *b*t k	Mcr k-ft	Mu k-ft	Phi	Phi Mn k-ft	As in ²	As Ratio	0.6 * rho bal	Bar 'd'
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
+1.20D+0.50W at 5.72 to 6.13	1.600	13.788	0.46	0.52	0.90	2.13	0.116	0.0025	0.0066	0.00
+1.20D+L+W at 5.72 to 6.13	2.600	13.788	0.46	1.13	0.90	2.37	0.116	0.0025	0.0062	0.00
+0.90D+W at 5.72 to 6.13	1.200	13.788	0.46	1.07	0.90	2.03	0.116	0.0025	0.0067	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00

Design Maximum Combinations - Deflections

Reactions - Deflections			Results reported for "Strip Width" = 12 in.					
Load Combination	Axial Load Pu k	Moment Values		I gross in^4	Stiffness I cracked in^4	I effective in^4	Deflections	
		Mcr k-ft	Mactual k-ft				Deflection in	Defl. Ratio
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
+D+0.60W at 6.13 to 6.53	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	1.312	0.46	0.63	342.40	28.11	32.190	0.147	1,000.5
+D+0.750L+0.450W at 5.72 to 6.13	2.083	0.46	0.47	342.40	30.12	74.186	0.030	4,902.1
+0.60D+0.60W at 6.13 to 6.53	0.787	0.46	0.63	342.40	26.71	30.790	0.148	993.3
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
W Only at 6.13 to 6.53	0.000	0.46	1.03	342.40	24.55	25.100	0.540	272.1
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
Reactions - Vertical & Horizontal								

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal		Top Horizontal		Vertical @ Wall Base	
D Only	0.0 k		0.00 k		1.625 k	
+D+L	0.0 k		0.00 k		2.625 k	
+D+0.750L	0.0 k		0.00 k		2.375 k	
+D+0.60W	0.2 k		0.20 k		1.625 k	

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Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

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DESCRIPTION: --None--

+D+0.750L+0.450W	0.2 k	0.15 k	2.375 k
+0.60D+0.60W	0.2 k	0.20 k	0.975 k
+D+0.70E	0.0 k	0.00 k	1.625 k
+D+0.750L+0.5250E	0.0 k	0.00 k	2.375 k

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
+0.60D+0.70E	0.0 k	0.00 k	0.975 k
L Only	0.0 k	0.00 k	1.000 k
W Only	0.3 k	0.34 k	0.000 k
E Only	0.0 k	0.00 k	0.000 k

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Boca Raton, FL 33431

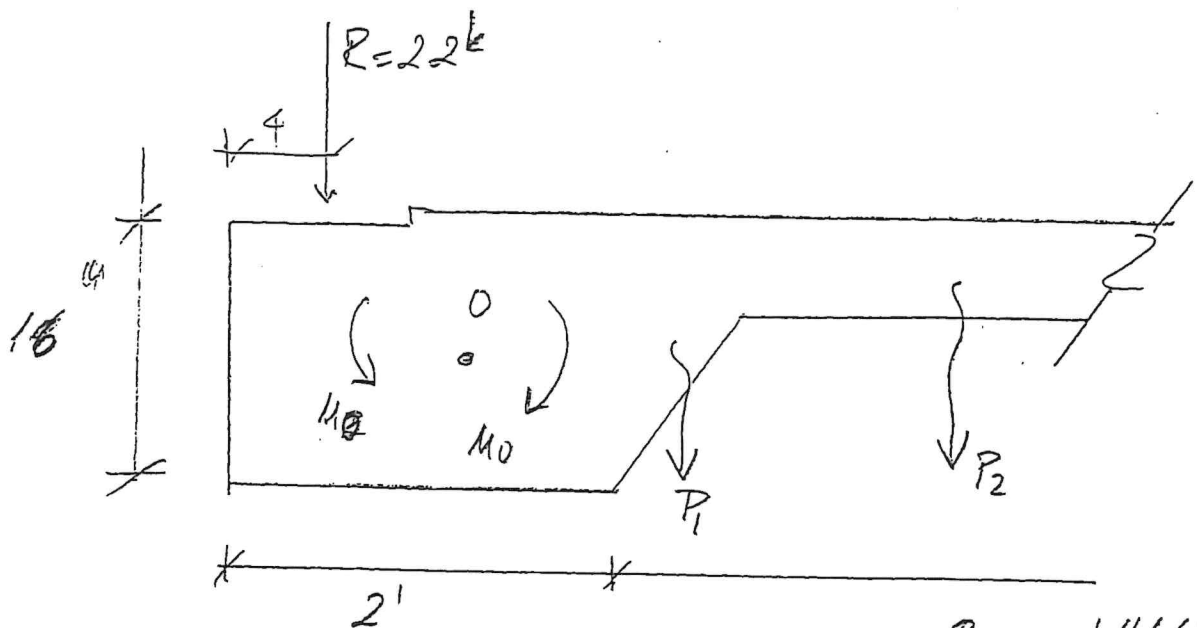
Phone: 561-705-2930 Fax: 561-431-3211

Email: yemeniciler@netzero.net

desupply@aol.com

Re: Bhagwansing Residence
8100 SW 120th Street
Tine Creek, FL

FOUNDATION CALCULATION



Best Regards,

$$M_S = M_D - M_R \geq$$

$$M_0 = 2,200 \times \frac{8}{12} = 1,466 \text{ # ft.}$$

$$M_R = (100 \times 1) + (240 \times 2.5) = 700 \text{ # ft.}$$

$$M_S = 766 \text{ # ft.}$$

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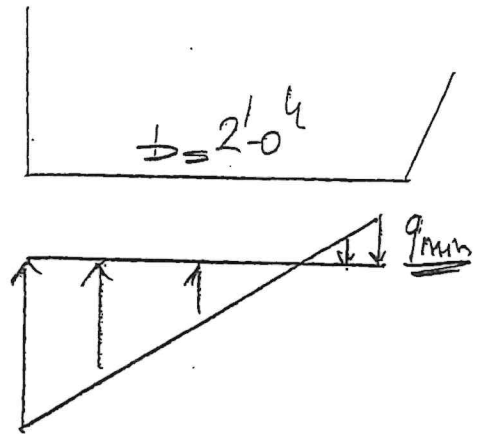
Boca Raton, FL 33431

Phone: 561-705-2930 Fax: 561-431-3211

Email: yemeniciler@netzero.net

desupply@aol.com

$$q_{max, min} = \frac{2,200}{2} \mp \frac{(6)M_k}{4}$$
$$= 1,100 \mp \frac{(6)(766)}{4} \quad \underline{\underline{q_{max}}}$$



$$q_{max} = 1,100 \mp 1,149$$

min.

$$q_{max} = 2,249 \text{ \#}/\text{ft}^2 < 2,500 \text{ o.k.}$$

$$q_{min} = -49 \text{ \#}/\text{ft}^2 \text{ o.k.}$$

Best Regards,

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FL. Reg # 54733

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- 63 -

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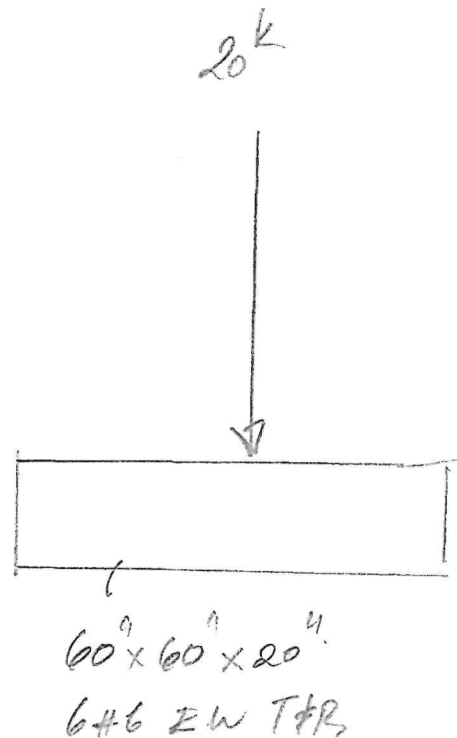
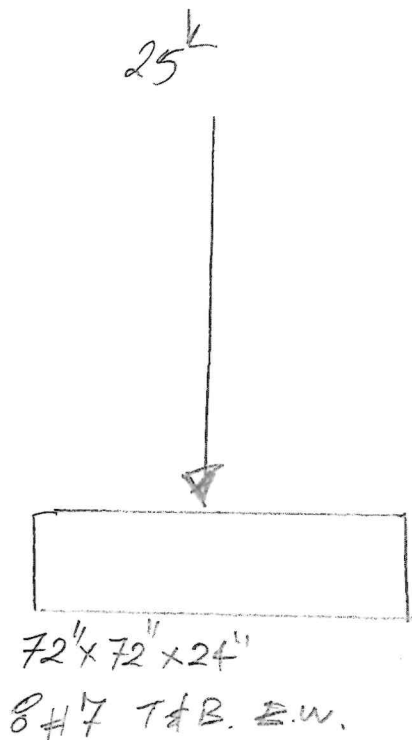
Boca Raton, FL 33431

P: 561-705-2930 F: 561-431-3211

Email: yemeniciler@netzero.net
desupply@aol.com

*Re: Bhajmansigh House
The crest, FL.*

Foundation, Interior FAD calculations



Best Regards,

Ali N. Yemeniciler, MsCE., P.E
FL. Reg # 54733

64
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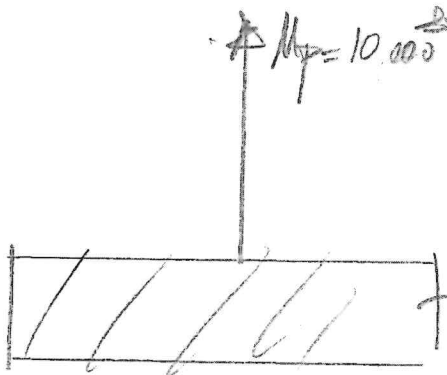
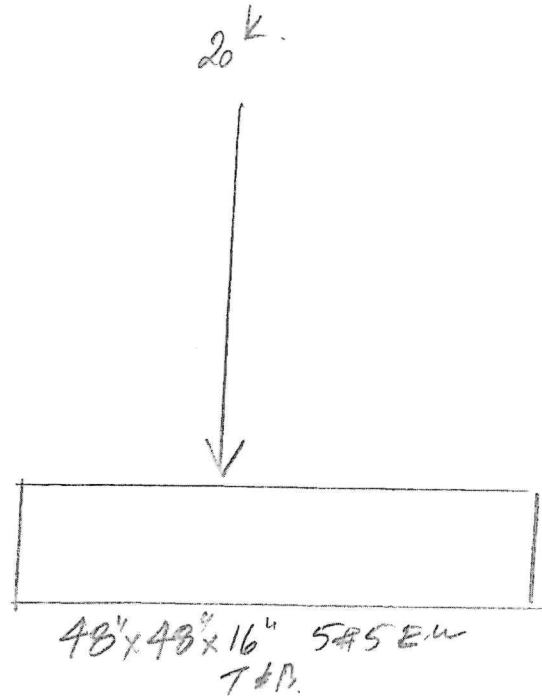
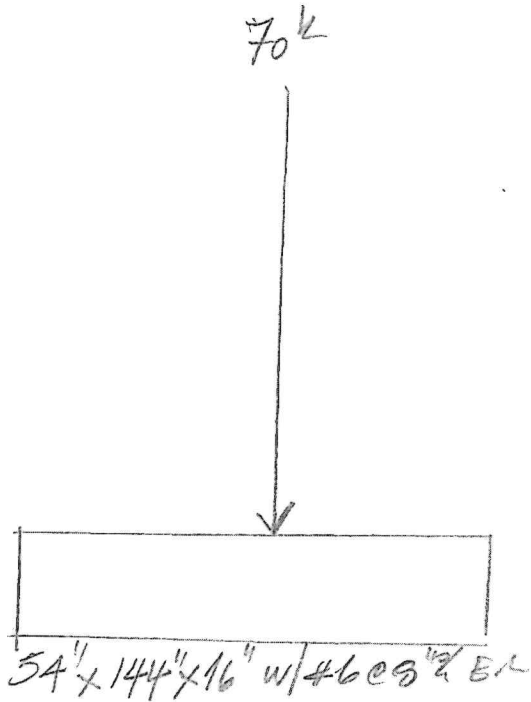
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Boca Raton, FL 33431

P: 561-705-2930 F: 561-431-3211

Email: yemeniciler@netzero.net

desupply@aol.com



Uplift stl column calculations

Best Regards,

$$6' \times 6' \times 2' \times 150 \frac{\#}{ft^3} = 10,800 \frac{\#}{ft^3} / 10,000 \text{ O.K. } \checkmark$$

65

Ali N. Yemeniciler, MsCE., P.E.
FL. Reg # 54733

"The Pressure's On Us."

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

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DESCRIPTION: --None--

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024

General Information

Material Properties

f_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	2.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	
when max. length or width is greater than	=	ksf
	=	ft

Dimensions

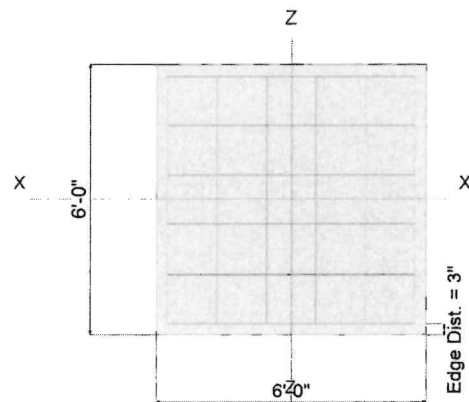
Width parallel to X-X Axis	=	6.0 ft
Length parallel to Z-Z Axis	=	6.0 ft
Footing Thickness	=	24.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



Bottom Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	# 7
Bars parallel to Z-Z Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	# 7
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



Top Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	7
Bars parallel to Z-Z Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	7
Rebar Centerline to Edge of Concrete... at Top of footing	=	3.0 in

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: ENERCALC_20

LIC# : KW-06015041, Build:20.25.04.16

Design Engineering & Supply Inc

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DESCRIPTION: --None--

Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	13.0		13.0					k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4048	Soil Bearing	1.012 ksf	2.50 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.08256	Z Flexure (+X) Bot Tens	4.550 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L
PASS	0.08256	Z Flexure (-X) Bot Tens	4.550 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L
PASS	0.08256	X Flexure (+Z) Bot Tens	4.550 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L
PASS	0.08256	X Flexure (-Z) Bot Tens	4.550 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L
PASS	0.0	Z Flexure (+X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS	0.0	Z Flexure (-X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS	0.0	X Flexure (+Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS	0.0	X Flexure (-Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS	0.06153	1-way Shear (+X)	5.056 psi	82.158 psi	+1.20D+1.60L
PASS	0.06153	1-way Shear (-X)	5.056 psi	82.158 psi	+1.20D+1.60L
PASS	0.06153	1-way Shear (+Z)	5.056 psi	82.158 psi	+1.20D+1.60L
PASS	0.06153	1-way Shear (-Z)	5.056 psi	82.158 psi	+1.20D+1.60L
PASS	0.1143	2-way Punching	18.778 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
			(in)	Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	2.50	n/a	0.0	0.6511	0.6511	n/a	n/a	0.260
X-X, +D+L	2.50	n/a	0.0	1.012	1.012	n/a	n/a	0.405
X-X, +D+0.750L	2.50	n/a	0.0	0.9219	0.9219	n/a	n/a	0.369
X-X, +0.60D	2.50	n/a	0.0	0.3907	0.3907	n/a	n/a	0.156
Z-Z, D Only	2.50	0.0	n/a	n/a	n/a	0.6511	0.6511	0.260
Z-Z, +D+L	2.50	0.0	n/a	n/a	n/a	1.012	1.012	0.405
Z-Z, +D+0.750L	2.50	0.0	n/a	n/a	n/a	0.9219	0.9219	0.369
Z-Z, +0.60D	2.50	0.0	n/a	n/a	n/a	0.3907	0.3907	0.156

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Tension on Bottom

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	2.275	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Footing Tension on Bottom

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	2.275	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D+1.60L	4.550	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D+1.60L	4.550	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D+L	3.575	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D+L	3.575	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D	1.950	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +0.90D	1.950	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +0.90D	1.463	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.40D	1.463	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.40D	2.275	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D+1.60L	2.275	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D+1.60L	4.550	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D+L	4.550	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D+L	3.575	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D	3.575	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D	1.950	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +0.90D	1.950	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +0.90D	1.463	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
	1.463	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK

Footing Tension on Top

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
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One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	2.53 psi	2.53 psi	2.53 psi	82.16 psi	0.03	OK
+1.20D+1.60L	5.06 psi	5.06 psi	5.06 psi	82.16 psi	0.06	OK
+1.20D+L	3.97 psi	3.97 psi	3.97 psi	82.16 psi	0.05	OK
+1.20D	2.17 psi	2.17 psi	2.17 psi	82.16 psi	0.03	OK
+0.90D	1.63 psi	1.63 psi	1.63 psi	82.16 psi	0.02	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	2.53 psi	2.53 psi	2.53 psi	82.16 psi	0.03	OK
+1.20D+1.60L	5.06 psi	5.06 psi	5.06 psi	82.16 psi	0.06	OK
+1.20D+L	3.97 psi	3.97 psi	3.97 psi	82.16 psi	0.05	OK
+1.20D	2.17 psi	2.17 psi	2.17 psi	82.16 psi	0.03	OK
+0.90D	1.63 psi	1.63 psi	1.63 psi	82.16 psi	0.02	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	9.39 psi	164.32 psi	0.06	OK
+1.20D+1.60L	18.78 psi	164.32 psi	0.11	OK
+1.20D+L	14.75 psi	164.32 psi	0.09	OK
+1.20D	8.05 psi	164.32 psi	0.05	OK
+0.90D	6.04 psi	164.32 psi	0.04	OK

All units k

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Applied Loads

P : Column Load	=	D	Lr	L	S	W	E	H	
OB : Overburden	=	13.0		13.0					
M-xx	=								k
M-zz	=								ksf
V-x	=								k-ft
V-z	=								k-ft

DESIGN SUMMARY

Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS 0.4048	Soil Bearing	1.012 ksf	2.50 ksf	+D+L about Z-Z axis
PASS n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS 0.08256	Z Flexure (+X) Bot Tens	4.550 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L
PASS 0.08256	Z Flexure (-X) Bot Tens	4.550 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L
PASS 0.08256	X Flexure (+Z) Bot Tens	4.550 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L
PASS 0.08256	X Flexure (-Z) Bot Tens	4.550 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L
PASS 0.0	Z Flexure (+X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.0	Z Flexure (-X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.0	X Flexure (+Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.0	X Flexure (-Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.06153	1-way Shear (+X)	5.056 psi	82.158 psi	+1.20D+1.60L
PASS 0.06153	1-way Shear (-X)	5.056 psi	82.158 psi	+1.20D+1.60L
PASS 0.06153	1-way Shear (+Z)	5.056 psi	82.158 psi	+1.20D+1.60L
PASS 0.06153	1-way Shear (-Z)	5.056 psi	82.158 psi	+1.20D+1.60L
PASS 0.1143	2-way Punching	18.778 psi	164.317 psi	+1.20D+1.60L

Design OK

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...

Gross Allowable	Xecc	Zecc	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
		(in)	Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	2.50	n/a	0.0	0.6511	n/a	n/a	0.260
X-X, +D+L	2.50	n/a	0.0	1.012	n/a	n/a	0.405
X-X, +D+0.750L	2.50	n/a	0.0	0.9219	n/a	n/a	0.369
Z-Z, D Only	2.50	0.0	n/a	0.3907	n/a	n/a	0.156
Z-Z, +D+L	2.50	0.0	n/a	n/a	0.6511	0.6511	0.260
Z-Z, +D+0.750L	2.50	0.0	n/a	n/a	0.9219	0.9219	0.405
Z-Z, +0.60D	2.50	0.0	n/a	n/a	0.3907	0.3907	0.369
							0.156

Overturning Stability

Rotation Axis & Load Combination...

Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning			All units k

Sliding Stability

Force Application Axis Load Combination...

Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding			
Footing Tension on Bottom			

Flexure Axis & Load Combination

Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK

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Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

LIC# : KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Footing Tension on Bottom

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D								
X-X, +1.20D+1.60L	2.275	-Z	Bottom	0.5184	ACI 7.6.1.1			
X-X, +1.20D+1.60L	4.550	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D+L	4.550	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D+L	3.575	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D	3.575	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +1.20D	1.950	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +0.90D	1.950	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
X-X, +0.90D	1.463	+Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.40D	1.463	-Z	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.40D	2.275	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D+1.60L	2.275	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D+1.60L	4.550	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D+L	4.550	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D+L	3.575	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D	3.575	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +1.20D	1.950	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +0.90D	1.950	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Z-Z, +0.90D	1.463	-X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
Footing Tension on Top	1.463	+X	Bottom	0.5184	ACI 7.6.1.1	0.60	55.112	OK
						0.60	55.112	OK

Footing Tension on Top

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
One Way Shear X								
Load Combination...								

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D						
+1.20D+1.60L	2.53 psi	2.53 psi	2.53 psi	82.16 psi	0.03	OK
+1.20D+L	5.06 psi	5.06 psi	5.06 psi	82.16 psi	0.06	OK
+1.20D	3.97 psi	3.97 psi	3.97 psi	82.16 psi	0.05	OK
+0.90D	2.17 psi	2.17 psi	2.17 psi	82.16 psi	0.03	OK
One Way Shear Z	1.63 psi	1.63 psi	1.63 psi	82.16 psi	0.02	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	2.53 psi	2.53 psi	2.53 psi	82.16 psi	0.03	OK
+1.20D+1.60L	5.06 psi	5.06 psi	5.06 psi	82.16 psi	0.06	OK
+1.20D+L	3.97 psi	3.97 psi	3.97 psi	82.16 psi	0.05	OK
+1.20D	2.17 psi	2.17 psi	2.17 psi	82.16 psi	0.03	OK
+0.90D	1.63 psi	1.63 psi	1.63 psi	82.16 psi	0.02	OK
Two-Way "Punching" Shear						
Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	2.53 psi	2.53 psi	2.53 psi	82.16 psi	0.03	OK
+1.20D+1.60L	5.06 psi	5.06 psi	5.06 psi	82.16 psi	0.06	OK
+1.20D+L	3.97 psi	3.97 psi	3.97 psi	82.16 psi	0.05	OK
+1.20D	2.17 psi	2.17 psi	2.17 psi	82.16 psi	0.03	OK
+0.90D	1.63 psi	1.63 psi	1.63 psi	82.16 psi	0.02	OK
Two-Way "Punching" Shear						
Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	2.53 psi	2.53 psi	2.53 psi	82.16 psi	0.03	OK
+1.20D+1.60L	5.06 psi	5.06 psi	5.06 psi	82.16 psi	0.06	OK
+1.20D+L	3.97 psi	3.97 psi	3.97 psi	82.16 psi	0.05	OK
+1.20D	2.17 psi	2.17 psi	2.17 psi	82.16 psi	0.03	OK
+0.90D	1.63 psi	1.63 psi	1.63 psi	82.16 psi	0.02	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	9.39 psi	164.32 psi	0.06	OK
+1.20D+1.60L	18.78 psi	164.32 psi	0.11	OK
+1.20D+L	14.75 psi	164.32 psi	0.09	OK
+1.20D	8.05 psi	164.32 psi	0.05	OK
+0.90D	6.04 psi	164.32 psi	0.04	OK

All units k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024

General Information

Material Properties

f_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	2.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf

Increases based on footing plan dimension

Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	5.0 ft
Length parallel to Z-Z Axis	=	5.0 ft
Footing Thickness	=	20.0 in

Pedestal dimensions...

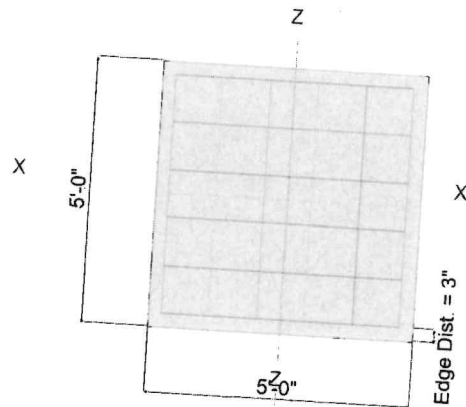
p_x : parallel to X-X Axis	=	in
p_z : parallel to Z-Z Axis	=	in
Height	=	in

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a

Bottom Reinforcing

Bars parallel to X-X Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	# 6
Bars parallel to Z-Z Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	# 6
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



Top Reinforcing

Bars parallel to X-X Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	# 6
Bars parallel to Z-Z Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	# 6
Rebar Centerline to Edge of Concrete... at Top of footing	=	3.0 in

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Applied Loads

P : Column Load	=	D	Lr	L	S	W	E	H	
OB : Overburden	=	13.0		13.0					
M-xx	=								k
M-zz	=								ksf
V-x	=								k-ft
V-z	=								k-ft
	=								k
	=								k

DESIGN SUMMARY

Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS 0.5128	Soil Bearing	1.282 ksf	2.50 ksf	+D+L about Z-Z axis
PASS n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS 0.1162	Uplift	0.0 k	0.0 k	No Uplift
PASS 0.1162	Z Flexure (+X) Bot Tens	4.550 k-ft/ft	39.162 k-ft/ft	+1.20D+1.60L
PASS 0.1162	Z Flexure (-X) Bot Tens	4.550 k-ft/ft	39.162 k-ft/ft	+1.20D+1.60L
PASS 0.1162	X Flexure (+Z) Bot Tens	4.550 k-ft/ft	39.162 k-ft/ft	+1.20D+1.60L
PASS 0.0	X Flexure (-Z) Bot Tens	4.550 k-ft/ft	39.162 k-ft/ft	+1.20D+1.60L
PASS 0.0	Z Flexure (+X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	+1.20D+1.60L
PASS 0.0	Z Flexure (-X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.0	X Flexure (+Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.0	X Flexure (-Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.09556	1-way Shear (+X)	7.851 psi	82.158 psi	+1.20D+1.60L
PASS 0.09556	1-way Shear (-X)	7.851 psi	82.158 psi	+1.20D+1.60L
PASS 0.09556	1-way Shear (+Z)	7.851 psi	82.158 psi	+1.20D+1.60L
PASS 0.09556	1-way Shear (-Z)	7.851 psi	82.158 psi	+1.20D+1.60L
PASS 0.1766	2-way Punching	29.019 psi	164.317 psi	+1.20D+1.60L

Design OK

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
			(in)	Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	2.50	n/a	0.0	0.7617	0.7617	n/a	n/a	0.305
X-X, +D+L	2.50	n/a	0.0	1.282	1.282	n/a	n/a	0.513
X-X, +D+0.750L	2.50	n/a	0.0	1.152	1.152	n/a	n/a	0.461
X-X, +0.60D	2.50	n/a	0.0	0.4570	0.4570	n/a	n/a	0.183
Z-Z, D Only	2.50	0.0	n/a	n/a	n/a	0.7617	0.7617	0.305
Z-Z, +D+L	2.50	0.0	n/a	n/a	n/a	1.282	1.282	0.513
Z-Z, +D+0.750L	2.50	0.0	n/a	n/a	n/a	1.152	1.152	0.461
Z-Z, +0.60D	2.50	0.0	n/a	n/a	n/a	0.4570	0.4570	0.183

Overturning Stability

Rotation Axis & Load Combination...

Footing Has NO Overturning

Overturning Moment

Resisting Moment

Stability Ratio

Status

Sliding Stability

Force Application Axis Load Combination...

Footing Has NO Sliding

Footing Tension on Bottom

Sliding Force

Resisting Force

Stability Ratio

Status

All units k

Flexure Axis & Load Combination

X-X, +1.40D

Mu
k-ft

Side

Tension
Surface

As Req'd
in^2

Gvrn. As
in^2

Actual As
in^2

Phi*Mn
k-ft

Status

73

OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Footing Tension on Bottom

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	2.275	-Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
X-X, +1.20D+1.60L	4.550	+Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
X-X, +1.20D+1.60L	4.550	-Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
X-X, +1.20D+L	3.575	+Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
X-X, +1.20D	3.575	-Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
X-X, +1.20D	1.950	+Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
X-X, +0.90D	1.950	-Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
X-X, +0.90D	1.463	+Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +1.40D	1.463	-Z	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +1.40D	2.275	-X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +1.20D+1.60L	2.275	+X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +1.20D+1.60L	4.550	-X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +1.20D+L	4.550	+X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +1.20D+L	3.575	-X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +1.20D	3.575	+X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +1.20D	1.950	-X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +0.90D	1.950	+X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +0.90D	1.463	-X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK
Z-Z, +0.90D	1.463	+X	Bottom	0.4320	ACI 7.6.1.1	0.5280	39.162	OK

Footing Tension on Top

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
One Way Shear X								
Load Combination...								
+1.40D			Vu @ -X		Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn Status
+1.20D+1.60L			3.93 psi		3.93 psi	3.93 psi	82.16 psi	0.05 OK
+1.20D+L			7.85 psi		7.85 psi	7.85 psi	82.16 psi	0.10 OK
+1.20D			6.17 psi		6.17 psi	6.17 psi	82.16 psi	0.08 OK
+0.90D			3.37 psi		3.37 psi	3.37 psi	82.16 psi	0.04 OK
			2.52 psi		2.52 psi	2.52 psi	82.16 psi	0.03 OK
One Way Shear Z								
Load Combination...								
+1.40D			Vu @ -Z		Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn Status
+1.20D+1.60L			3.93 psi		3.93 psi	3.93 psi	82.16 psi	0.05 OK
+1.20D+L			7.85 psi		7.85 psi	7.85 psi	82.16 psi	0.10 OK
+1.20D			6.17 psi		6.17 psi	6.17 psi	82.16 psi	0.08 OK
+0.90D			3.37 psi		3.37 psi	3.37 psi	82.16 psi	0.04 OK
			2.52 psi		2.52 psi	2.52 psi	82.16 psi	0.03 OK

All units k

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	14.51 psi	164.32 psi	0.09	OK
+1.20D+1.60L	29.02 psi	164.32 psi	0.18	OK
+1.20D+L	22.80 psi	164.32 psi	0.14	OK
+1.20D	12.44 psi	164.32 psi	0.08	OK
+0.90D	9.33 psi	164.32 psi	0.06	OK

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024

General Information

Material Properties

f_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	2.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf

Increases based on footing plan dimension

Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	4.50 ft
Length parallel to Z-Z Axis	=	12.0 ft
Footing Thickness	=	16.0 in

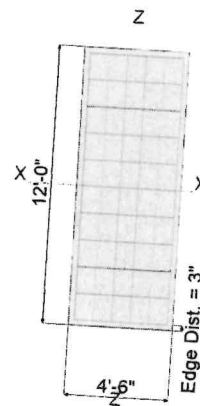
Pedestal dimensions...

px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in

Bandwidth Distribution Check (ACI 15.4.4.2)

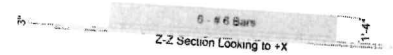
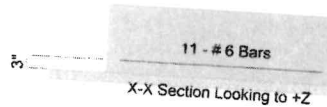
Direction Requiring Closer Separation Bars along X-X Axis

# Bars required within zone	54.5 %
# Bars required on each side of zone	45.5 %



Bottom Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		
Reinforcing Bar Size	=	#	11
Bars parallel to Z-Z Axis			
Number of Bars	=		6
Reinforcing Bar Size	=	#	6
Rebar Centerline to Edge of Concrete... at Bottom of footing	=		
on Reinforce			3.0 in



Top Reinforcing

Bars parallel to X-X Axis		
Number of Bars	=	11
Reinforcing Bar Size	=	6
Bars parallel to Z-Z Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	6
Rebar Centerline to Edge of Concrete... at Top of footing	=	3.0 in

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Applied Loads

P : Column Load	=	D	Lr	L	S	W	E	H	
OB : Overburden	=	35.0		35.0					
M-xx	=								k
M-zz	=								ksf
V-x	=								k-ft
V-z	=								k-ft
									k
									k

DESIGN SUMMARY

Design OK

k

Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.5960	Soil Bearing	1.490 ksf	2.50 ksf
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft
PASS	n/a	Sliding - X-X	0.0 k	0.0 k
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k
PASS	n/a	Uplift	0.0 k	0.0 k
PASS	0.2008	Z Flexure (+X) Bot Tens	4.594 k-ft/ft	22.877 k-ft/ft
PASS	0.2008	Z Flexure (-X) Bot Tens	4.594 k-ft/ft	22.877 k-ft/ft
PASS	0.9959	X Flexure (+Z) Bot Tens	32.667 k-ft/ft	32.802 k-ft/ft
PASS	0.9959	X Flexure (-Z) Bot Tens	32.667 k-ft/ft	32.802 k-ft/ft
PASS	0.0	Z Flexure (+X) Top Tens	0 k-ft/ft	0.0 k-ft/ft
PASS	0.0	Z Flexure (-X) Top Tens	0 k-ft/ft	0.0 k-ft/ft
PASS	0.0	X Flexure (+Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft
PASS	0.0	X Flexure (-Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft
PASS	0.1657	1-way Shear (+X)	13.611 psi	82.158 psi
PASS	0.1657	1-way Shear (-X)	13.611 psi	82.158 psi
PASS	0.6967	1-way Shear (+Z)	57.236 psi	82.158 psi
PASS	0.6967	1-way Shear (-Z)	57.236 psi	82.158 psi
PASS	0.8611	2-way Punching	141.491 psi	164.317 psi

ailed Results

Design OK

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
			(in)	Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	2.50	n/a	0.0	0.8415	0.8415	n/a	n/a	0.337
X-X, +D+L	2.50	n/a	0.0	1.490	1.490	n/a	n/a	0.596
X-X, +D+0.750L	2.50	n/a	0.0	1.328	1.328	n/a	n/a	0.531
Z-Z, D Only	2.50	0.0	n/a	0.5049	0.5049	n/a	n/a	0.202
Z-Z, +D+L	2.50	0.0	n/a	n/a	n/a	0.8415	0.8415	0.337
Z-Z, +D+0.750L	2.50	0.0	n/a	n/a	n/a	1.490	1.490	0.596
Z-Z, +0.60D	2.50	0.0	n/a	n/a	n/a	1.328	1.328	0.531
						0.5049	0.5049	0.202

Overturning Stability

Rotation Axis & Load Combination...

Footing Has NO Overturning

Overturning Moment

Resisting Moment

Stability Ratio

Status

All units k

Sliding Stability

Force Application Axis & Load Combination...

Footing Has NO Sliding

Footing Tension on Bottom

Sliding Force

Resisting Force

Stability Ratio

Status

Flexure Axis & Load Combination

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	16.333	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5867	32.802	OK

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Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Footing Tension on Bottom

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	16.333	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5867	32.802	OK
X-X, +1.20D+1.60L	32.667	+Z	Bottom	0.5841	Applied Mu	0.5867	32.802	OK
X-X, +1.20D+1.60L	32.667	-Z	Bottom	0.5841	Applied Mu	0.5867	32.802	OK
X-X, +1.20D+L	25.667	+Z	Bottom	0.4543	Applied Mu	0.5867	32.802	OK
X-X, +1.20D+L	25.667	-Z	Bottom	0.4543	Applied Mu	0.5867	32.802	OK
X-X, +1.20D	14.0	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5867	32.802	OK
X-X, +1.20D	14.0	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5867	32.802	OK
X-X, +0.90D	10.50	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5867	32.802	OK
X-X, +0.90D	10.50	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5867	32.802	OK
Z-Z, +1.40D	2.297	-X	Bottom	0.3456	ACI 7.6.1.1	0.5867	32.802	OK
Z-Z, +1.40D	2.297	+X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK
Z-Z, +1.20D+1.60L	4.594	-X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK
Z-Z, +1.20D+1.60L	4.594	+X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK
Z-Z, +1.20D+L	3.609	-X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK
Z-Z, +1.20D+L	3.609	+X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK
Z-Z, +1.20D	1.969	-X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK
Z-Z, +1.20D	1.969	+X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK
Z-Z, +0.90D	1.477	-X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK
Z-Z, +0.90D	1.477	+X	Bottom	0.3456	ACI 7.6.1.1	0.4033	22.877	OK

Footing Tension on Top

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
One Way Shear X								
Load Combination...								
+1.40D			Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.20D+1.60L			6.81 psi	6.81 psi	28.62 psi	82.16 psi	0.35	OK
+1.20D+L			13.61 psi	13.61 psi	57.24 psi	82.16 psi	0.70	OK
+1.20D			10.69 psi	10.69 psi	44.97 psi	82.16 psi	0.55	OK
+0.90D			5.83 psi	5.83 psi	24.53 psi	82.16 psi	0.30	OK
One Way Shear Z								
Load Combination...								
+1.40D			Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.20D+1.60L			28.62 psi	28.62 psi	28.62 psi	82.16 psi	0.35	OK
+1.20D+L			57.24 psi	57.24 psi	57.24 psi	82.16 psi	0.70	OK
+1.20D			44.97 psi	44.97 psi	44.97 psi	82.16 psi	0.55	OK
+0.90D			24.53 psi	24.53 psi	24.53 psi	82.16 psi	0.30	OK
			18.40 psi	18.40 psi	18.40 psi	82.16 psi	0.22	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	70.75 psi	164.32 psi	0.43	OK
+1.20D+1.60L	141.49 psi	164.32 psi	0.86	OK
+1.20D+L	111.17 psi	164.32 psi	0.68	OK
+1.20D	60.64 psi	164.32 psi	0.37	OK
+0.90D	45.48 psi	164.32 psi	0.28	OK

All units k

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Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

LIC#: KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024

General Information

Material Properties

fc : Concrete 28 day strength	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Soil Design Values

Allowable Soil Bearing	=	2.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf

Increases based on footing plan dimension

Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	4.0 ft
Length parallel to Z-Z Axis	=	4.0 ft
Footing Thickness	=	16.0 in

Pedestal dimensions...

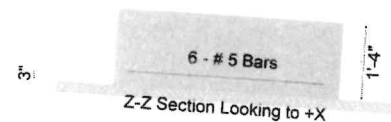
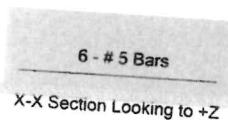
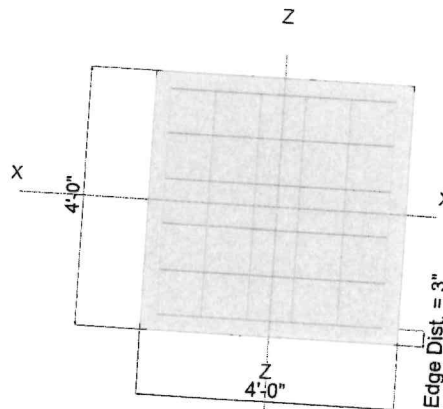
px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a

Bottom Reinforcing

Bars parallel to X-X Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	# 5
Bars parallel to Z-Z Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	# 5
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



Top Reinforcing

Bars parallel to X-X Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	5
Bars parallel to Z-Z Axis		
Number of Bars	=	6
Reinforcing Bar Size	=	5
Rebar Centerline to Edge of Concrete... at Top of footing	=	3.0 in

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

LIC# : KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Applied Loads

P : Column Load	=	D	Lr	L	S	W	E	H	
OB : Overburden	=	15.0		20.0					
M-xx	=								k
M-zz	=								ksf
V-x	=								k-ft
V-z	=								k-ft
	=								k
	=								k

DESIGN SUMMARY

Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS 0.9524	Soil Bearing	2.381 ksf	2.50 ksf	+D+L about Z-Z axis
PASS n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS 0.2381	Z Flexure (+X) Bot Tens	6.250 k-ft/ft	26.249 k-ft/ft	+1.20D+1.60L
PASS 0.2381	Z Flexure (-X) Bot Tens	6.250 k-ft/ft	26.249 k-ft/ft	+1.20D+1.60L
PASS 0.2381	X Flexure (+Z) Bot Tens	6.250 k-ft/ft	26.249 k-ft/ft	+1.20D+1.60L
PASS 0.2381	X Flexure (-Z) Bot Tens	6.250 k-ft/ft	26.249 k-ft/ft	+1.20D+1.60L
PASS 0.0	Z Flexure (+X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	+1.20D+1.60L
PASS 0.0	Z Flexure (-X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.0	X Flexure (+Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.0	X Flexure (-Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS 0.2243	1-way Shear (+X)	18.429 psi	82.158 psi	+1.20D+1.60L
PASS 0.2243	1-way Shear (-X)	18.429 psi	82.158 psi	+1.20D+1.60L
PASS 0.2243	1-way Shear (+Z)	18.429 psi	82.158 psi	+1.20D+1.60L
PASS 0.2243	1-way Shear (-Z)	18.429 psi	82.158 psi	+1.20D+1.60L
PASS 0.4148	2-way Punching	68.166 psi	164.317 psi	+1.20D+1.60L

Design OK

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
			(in)	Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	2.50	n/a	0.0	1.131	1.131	n/a	n/a	0.452
X-X, +D+L	2.50	n/a	0.0	2.381	2.381	n/a	n/a	
X-X, +D+0.750L	2.50	n/a	0.0	2.068	2.068	n/a	n/a	0.952
X-X, +0.60D	2.50	n/a	0.0	0.6785	0.6785	n/a	n/a	
Z-Z, D Only	2.50	0.0	n/a	n/a	n/a	n/a	n/a	0.827
Z-Z, +D+L	2.50	0.0	n/a	n/a	n/a	1.131	1.131	
Z-Z, +D+0.750L	2.50	0.0	n/a	n/a	n/a	2.381	2.381	0.452
Z-Z, +0.60D	2.50	0.0	n/a	n/a	n/a	2.068	2.068	
Overturning Stability						0.6785	0.6785	0.827
Rotation Axis &								0.271

Overturning Stability

Rotation Axis & Load Combination...

Footing Has NO Overturning

Overturning Moment

Resisting Moment

Stability Ratio

Status

All units k

Sliding Stability

Force Application Axis Load Combination...

Footing Has NO Sliding

Footing Tension on Bottom

Sliding Force

Resisting Force

Stability Ratio

Status

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	2.625	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK

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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

LIC# : KW-06015041, Build:20.25.04.16

DESCRIPTION: --None--

Design Engineering & Supply Inc

Project File: ENERCALC_20

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Footing Tension on Bottom

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	2.625	-Z	Bottom	0.3456	ACI 7.6.1.1			
X-X, +1.20D+1.60L	6.250	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+1.60L	6.250	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+L	4.750	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+L	4.750	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D	2.250	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D	2.250	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +0.90D	1.688	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +0.90D	1.688	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.40D	2.625	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.40D	2.625	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+1.60L	6.250	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+1.60L	6.250	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+L	4.750	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+L	4.750	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D	2.250	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D	2.250	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +0.90D	1.688	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +0.90D	1.688	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK

Footing Tension on Top

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
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One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	7.74 psi	7.74 psi	7.74 psi	82.16 psi	0.09	OK
+1.20D+1.60L	18.43 psi	18.43 psi	18.43 psi	82.16 psi	0.22	OK
+1.20D+L	14.01 psi	14.01 psi	14.01 psi	82.16 psi	0.17	OK
+1.20D	6.64 psi	6.64 psi	6.64 psi	82.16 psi	0.08	OK
+0.90D	4.98 psi	4.98 psi	4.98 psi	82.16 psi	0.06	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	7.74 psi	7.74 psi	7.74 psi	82.16 psi	0.09	OK
+1.20D+1.60L	18.43 psi	18.43 psi	18.43 psi	82.16 psi	0.22	OK
+1.20D+L	14.01 psi	14.01 psi	14.01 psi	82.16 psi	0.17	OK
+1.20D	6.64 psi	6.64 psi	6.64 psi	82.16 psi	0.08	OK
+0.90D	4.98 psi	4.98 psi	4.98 psi	82.16 psi	0.06	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	28.63 psi	164.32 psi	0.17	OK
+1.20D+1.60L	68.17 psi	164.32 psi	0.41	OK
+1.20D+L	51.81 psi	164.32 psi	0.32	OK
+1.20D	24.54 psi	164.32 psi	0.15	OK
+0.90D	18.41 psi	164.32 psi	0.11	OK

All units k

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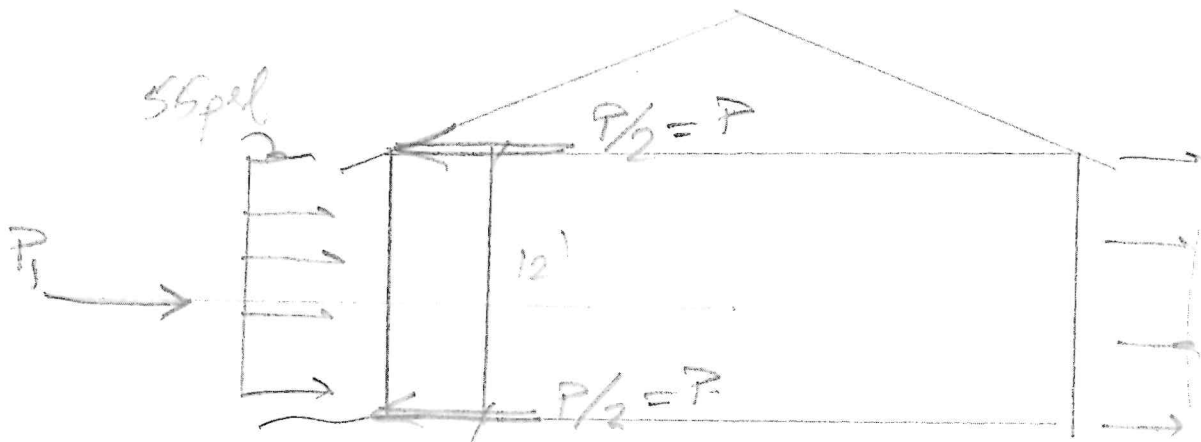
Boca Raton, FL 33431

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Email: yemeniciler@netzero.net

desupply@aol.com

Roof Sheathing Diagram Calculations



$$P/2 = 55 \text{ psf} \times 6' \Rightarrow 330 \# = P.$$

Best Regards,

Ali N. Yemeniciler, MsCE., P.E.
FL. Reg # 54733

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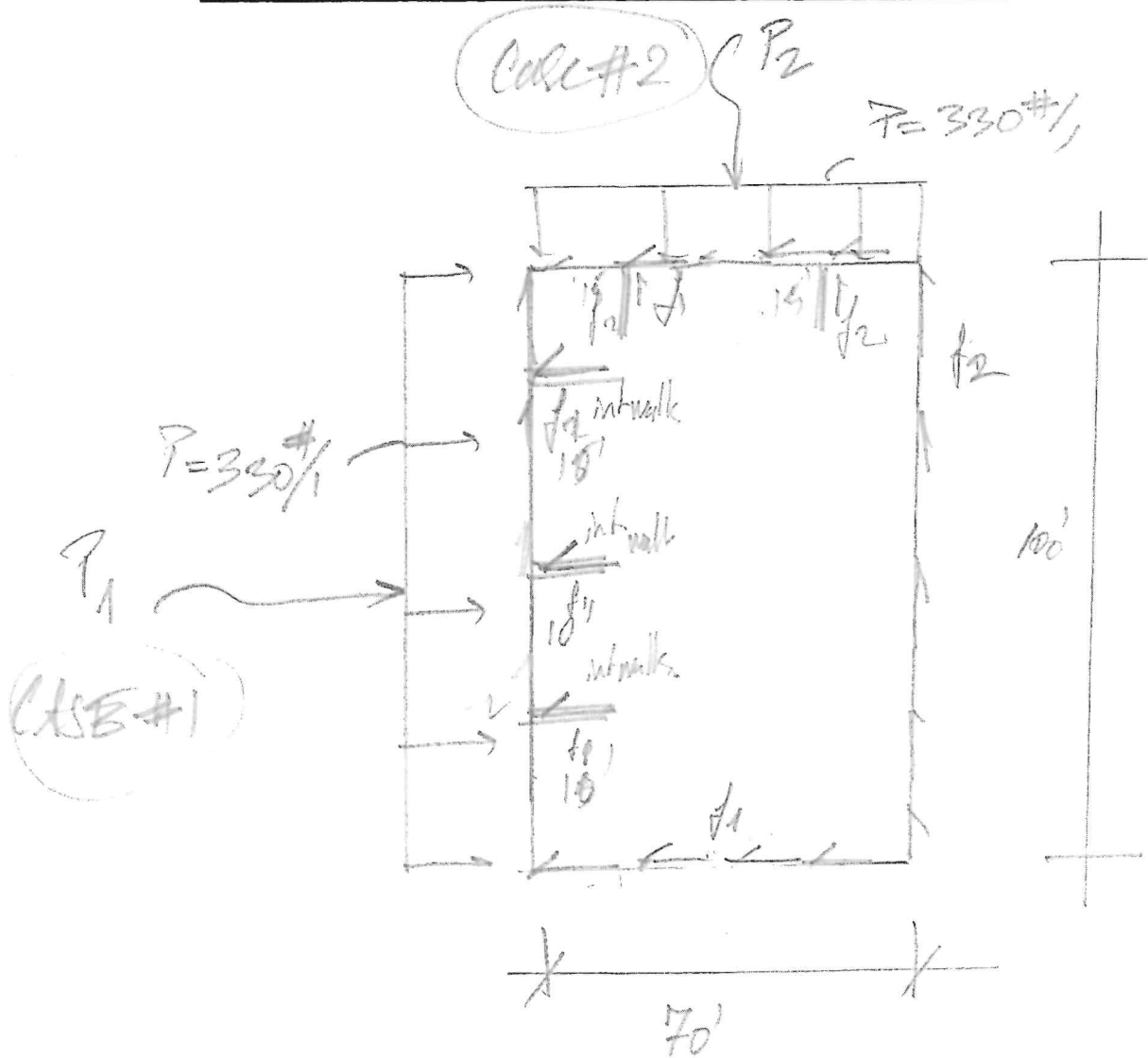
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$$P_1 = 330 \times 100' = 33,000\#$$

$$P_2 = 340 \times 70' = 23,800\#$$

CASE 1 $\Rightarrow$ 1. 4sng No inter wall. (Worst case not fence also)

$$\text{dia } \frac{33,000\#}{2} = \frac{16,500}{70'} = 235\#/\text{ft}$$

2. 4sng Black walls also =

$$\text{dia } = \frac{33,000}{5} = \frac{6,600}{170'} = 38\#/\text{ft}$$

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CASE #2

a). No Block Wall supports Worst case

$$P_2 = \frac{P_2}{2} / 200' = \frac{23,100}{400} = 57\#, \text{ O.K.}$$

Support

$$\frac{P_2}{4} = 15\#, \text{ O.K.}$$

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FL. Reg # 54733

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