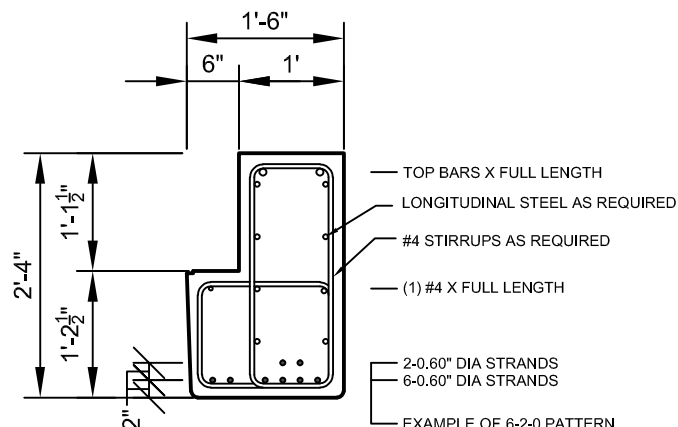# Prestressed Concrete
LEDGER BEAM 18LB28

PHYSICAL PROPERTIES

A = 423 in.^{2} S_b = 2,111 in.^{3}
I = 26,625 in.^{4} S_t = 1,730 in.^{3}
Y_b = 12.61 in.   Wt.= 441 PLF
Y_t = 15.39 in.

TOP BARS X FULL LENGTH
LONGITUDINAL STEEL AS REQUIRED
#4 STIRRUPS AS REQUIRED
(1) #4 X FULL LENGTH
2-0.60" DIA STRANDS
6-0.60" DIA STRANDS
EXAMPLE OF 6-2-0 PATTERN

DESIGN DATA

1. Precast Strength @ 28 days = 6,000 PSI.
2. Precast Strength @ release = 4,000 PSI.
3. Precast Density = 150 PCF.
4. Strand = 0.60"Ø 270K Lo-Relaxation.
5. Ultimate moment capacity shown below is for full strand development & tension controlled section.
6. Maximum bottom tensile stress is $12\sqrt{f'c}$ = 930 PSI.
7. Flexural strength capacity is based on stress/strain strand relationships and is slightly variable.
8. Deflection limits were not considered when determining allowable loads in this table.
9. All superimposed live loads listed are controlled by ultimate flexural strength, not allowable stresses.
10. All superimposed load is treated as live load in the flexural strength analysis.   To determine the allowable live load if the amount of superimposed dead load is known use the following conversion method...

$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

11. If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
12. The concrete strength at release of prestress force increases to 4,500 psi for more than 10 strands.
13. Load values to the left of the solid line are controlled by torsional section property limits.
14. Load values to the right of the solid line are controlled by ultimate moment capacity.
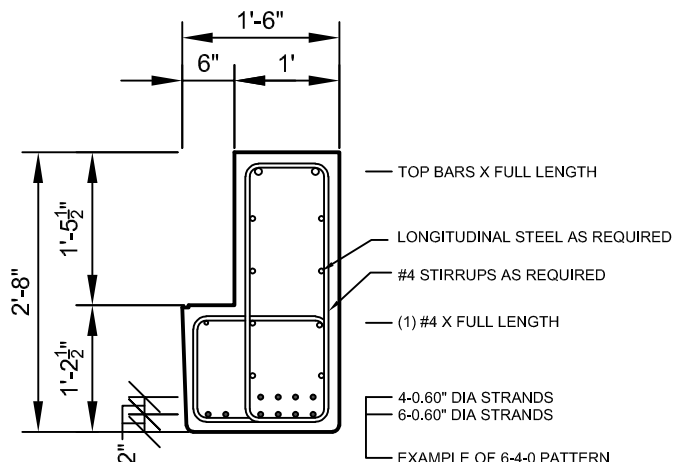
ALLOWABLE SUPERIMPOSED LIVE LOADS (KLF)

Strand Pattern	Top Bars	Moment Capacity	SPAN													
			16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'
6 - 0 - 0	4 - #7	7,405 "k	9.7	7.8	6.6	5.5	4.9	4.2	3.6	3.0	2.6	2.3	2.0	1.8	1.5	1.4
6 - 2 - 0	4 - #7	9,346 "k	10.3	8.9	7.8	7.0	6.3	5.4	4.6	3.9	3.4	3.0	2.6	2.3	2.1	1.8
6 - 4 - 0	6 - #8	11,220 "k	10.3	8.9	7.8	7.0	6.1	5.1	4.7	4.6	4.0	3.5	3.2	2.8	2.5	2.3

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11/2020

18LB28

Prestressed Concrete
LEDGER BEAM 18LB32

PHYSICAL PROPERTIES

A = 471 in.^{2} S_b = 2,762 in.^{3}
I = 39,723 in.^{4} S_t = 2,555 in.^{3}
Y_b = 14.38 in.   Wt.= 491 PLF
Y_t = 17.62 in.

TOP BARS X FULL LENGTH
LONGITUDINAL STEEL AS REQUIRED
#4 STIRRUPS AS REQUIRED
(1) #4 X FULL LENGTH
4-0.60" DIA STRANDS
6-0.60" DIA STRANDS
EXAMPLE OF 6-4-0 PATTERN

DESIGN DATA

1. Precast Strength @ 28 days = 6,000 PSI.
2. Precast Strength @ release = 4,000 PSI.
3. Precast Density = 150 PCF.
4. Strand = 0.60"Ø 270K Lo-Relaxation.
5. Ultimate moment capacity shown below is for full strand development & tension controlled section.
6. Maximum bottom tensile stress is $12\sqrt{f'c}$ = 930 PSI.
7. Flexural strength capacity is based on stress/strain strand relationships and is slightly variable.
8. Deflection limits were not considered when determining allowable loads in this table.
9. All superimposed live loads listed are controlled by ultimate flexural strength, not allowable stresses.
10. All superimposed load is treated as live load in the flexural strength analysis.   To determine the allowable live load if the amount of superimposed dead load is known use the following conversion method...

$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

11. If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
12. The concrete strength at release of prestress force increases to 4,500 psi for more than 12 strands.
13. Load values to the left of the solid line are controlled by torsional section property limits.
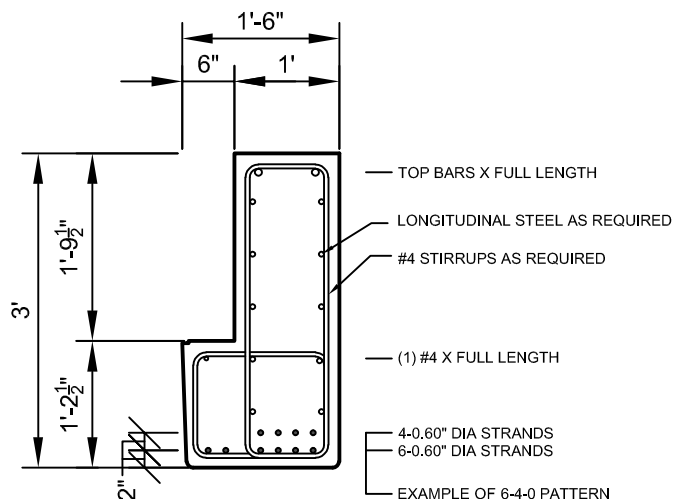14. Load values to the right of the solid line are controlled by ultimate moment capacity.

ALLOWABLE SUPERIMPOSED LIVE LOADS (KLF)

Strand Pattern	Top Bars	Moment Capacity	SPAN													
			16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'
6 - 0 - 0	4 - #7	8,680 "k	11.4	9.2	7.8	6.4	5.8	4.9	4.2	3.6	3.1	2.7	2.4	2.1	1.8	1.6
6 - 2 - 0	4 - #8	11,108 "k	11.8	10.2	8.9	8.0	7.2	6.4	5.5	4.7	4.1	3.6	3.2	2.8	2.5	2.2
6 - 4 - 0	4 - #9	13,436 "k	12.0	10.4	9.1	8.1	7.3	6.7	6.1	5.6	5.0	4.4	3.4	3.5	3.1	2.8

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18LB32

Prestressed Concrete
LEDGER BEAM 18LB36

PHYSICAL PROPERTIES

A = 519 in.^{2} S_b = 3,491 in.^{3}
I = 56,549 in.^{4} S_t = 2,856 in.^{3}
Y_b = 16.20 in.   Wt.= 541 PLF
Y_t = 19.80 in.

- TOP BARS X FULL LENGTH
- LONGITUDINAL STEEL AS REQUIRED
- #4 STIRRUPS AS REQUIRED
- (1) #4 X FULL LENGTH
- 4-0.60" DIA STRANDS
- 6-0.60" DIA STRANDS
- EXAMPLE OF 6-4-0 PATTERN

DESIGN DATA

1. Precast Strength @ 28 days = 6,000 PSI.
2. Precast Strength @ release = 4,000 PSI.
3. Precast Density = 150 PCF.
4. Strand = 0.60"Ø 270K Lo-Relaxation.
5. Ultimate moment capacity shown below is for full strand development & tension controlled section.
6. Maximum bottom tensile stress is $12\sqrt{f'c}$ = 930 PSI.
7. Flexural strength capacity is based on stress/strain strand relationships and is slightly variable.
8. Deflection limits were not considered when determining allowable loads in this table.
9. All superimposed live loads listed are controlled by ultimate flexural strength, not allowable stresses.
10. All superimposed load is treated as live load in the flexural strength analysis.   To determine the allowable live load if the amount of superimposed dead load is known use the following conversion method...

$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

11. If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
12. The concrete strength at release of prestress force increases to 4,500 psi for more than 14 strands.
13. Load values to the left of the solid line are controlled by torsional section property limits.
14. Load values to the right of the solid line are controlled by ultimate moment capacity.
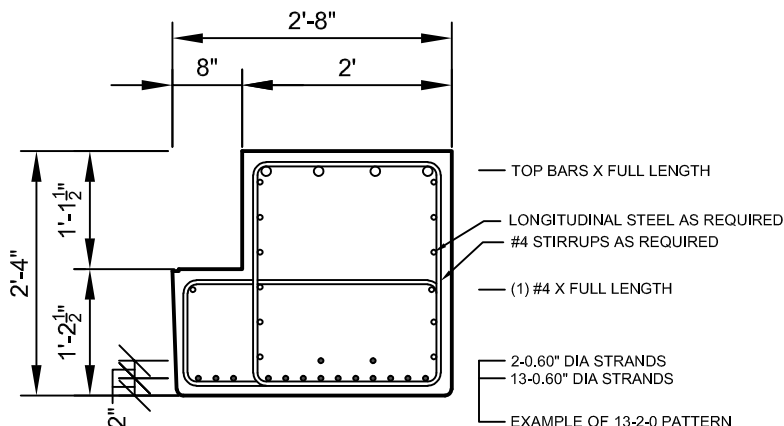
ALLOWABLE SUPERIMPOSED LIVE LOADS (KLF)

Strand Pattern	Top Bars	Moment Capacity	SPAN													
			16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'
6 - 0 - 0	4 - #7	10,042"k	11.8	10.4	9.0	7.5	6.7	5.7	4.9	4.2	3.6	3.2	2.8	2.4	2.2	1.9
6 - 4 - 0	4 - #7	15,428"k	11.9	10.4	9.9	8.8	8.0	7.2	6.7	6.2	5.7	5.1	4.5	4.0	3.6	3.2
6 - 6 - 0	4 - #7	17,702"k	13.2	11.4	10.0	9.0	8.1	7.4	6.8	6.3	5.8	5.4	5.1	4.7	4.2	3.7

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18LB36

Prestressed Concrete
LEDGER BEAM 32LB28

PHYSICAL PROPERTIES

$A = 788$ in.^{2} $\quad S_b = 3,878$ in.^{3}
$I = 50,443$ in.^{4} $\quad S_t = 3,364$ in.^{3}
$Y_b = 13.00$ in. $\quad$ Wt.$= 821$ PLF
$Y_t = 15.00$ in.

TOP BARS X FULL LENGTH
LONGITUDINAL STEEL AS REQUIRED
#4 STIRRUPS AS REQUIRED
(1) #4 X FULL LENGTH
2-0.60" DIA STRANDS
13-0.60" DIA STRANDS
EXAMPLE OF 13-2-0 PATTERN

DESIGN DATA

1. Precast Strength @ 28 days = 6,000 PSI.
2. Precast Strength @ release = 4,000 PSI.
3. Precast Density = 150 PCF.
4. Strand = 0.60"Ø 270K Lo-Relaxation.
5. Ultimate moment capacity shown below is for full strand development & tension controlled section.
6. Maximum bottom tensile stress is $12\sqrt{f'c} = 930$ PSI.
7. Flexural strength capacity is based on stress/strain strand relationships and is slightly variable.
8. Deflection limits were not considered when determining allowable loads in this table.
9. All superimposed live loads listed are controlled by ultimate flexural strength, not allowable stresses.
10. All superimposed load is treated as live load in the flexural strength analysis. To determine the allowable live load if the amount of superimposed dead load is known use the following conversion method...

$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

11. If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
12. The concrete strength at release of prestress force increases to 4,500 psi for more than 18 strands.
13. Load values to the left of the solid line are controlled by torsional section property limits.
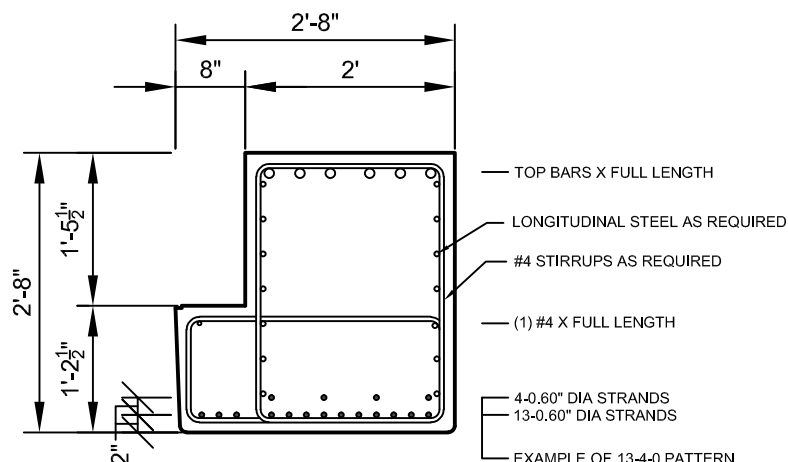14. Load values to the right of the solid line are controlled by ultimate moment capacity.

ALLOWABLE SUPERIMPOSED LIVE LOADS (KLF)

Strand Pattern	Top Bars	Moment Capacity	SPAN													
			16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'
8 - 0 - 0	2 - #9	10,150 "k	13.1	10.6	8.9	7.3	6.6	5.6	4.7	4.0	3.5	3.0	2.6	2.3	2.0	1.7
13 - 0 - 0	4 - #9	15,948 "k	18.3	15.6	14.1	11.9	10.7	9.2	7.8	6.7	5.8	5.1	4.5	3.9	3.5	3.1
13 - 2 - 0	4 - #9	17,900 "k	18.4	16.0	14.2	12.5	11.5	10.4	8.8	7.6	6.6	5.8	5.1	4.5	4.0	3.6
13 - 6 - 0	6 - #9	21,927 "k	18.7	16.3	14.4	12.9	11.7	10.7	9.8	9.1	8.3	7.2	6.4	5.7	5.0	4.5

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11/2020

32LB28

Prestressed Concrete
LEDGER BEAM 32LB32

PHYSICAL PROPERTIES

A = 884 in.^{2} S_b = 5,069 in.^{3}
I = 75,284 in.^{4} S_t = 4,390 in.^{3}
Y_b = 14.85 in.   Wt.= 921 PLF
Y_t = 17.15 in.

TOP BARS X FULL LENGTH
LONGITUDINAL STEEL AS REQUIRED
#4 STIRRUPS AS REQUIRED
(1) #4 X FULL LENGTH
4-0.60" DIA STRANDS
13-0.60" DIA STRANDS
EXAMPLE OF 13-4-0 PATTERN

DESIGN DATA

1. Precast Strength @ 28 days = 6,000 PSI.
2. Precast Strength @ release = 4,000 PSI.
3. Precast Density = 150 PCF.
4. Strand = 0.60"Ø 270K Lo-Relaxation.
5. Ultimate moment capacity shown below is for full strand development & tension controlled section.
6. Maximum bottom tensile stress is $12\sqrt{f'c}$ = 930 PSI.
7. Flexural strength capacity is based on stress/strain strand relationships and is slightly variable.
8. Deflection limits were not considered when determining allowable loads in this table.
9. All superimposed live loads listed are controlled by ultimate flexural strength, not allowable stresses.
10. All superimposed load is treated as live load in the flexural strength analysis.   To determine the allowable live load if the amount of superimposed dead load is known use the following conversion method...

$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

11. If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
12. The concrete strength at release of prestress force increases to 4,500 psi for more than 18 strands.
13. Load values to the left of the solid line are controlled by torsional section property limits.
14. Load values to the right of the solid line are controlled by ultimate moment capacity.
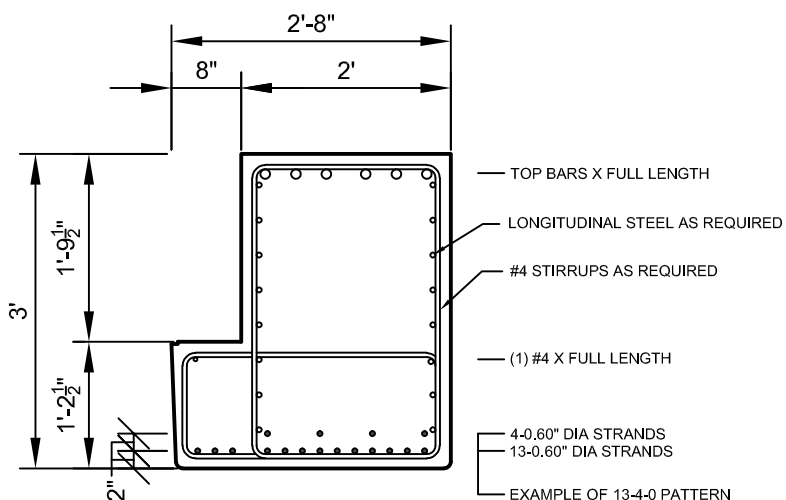
ALLOWABLE SUPERIMPOSED LIVE LOADS (KLF)

Strand Pattern	Top Bars	Moment Capacity	SPAN													
			20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'	44'	46'
8 - 0 - 0	2 - #9	11,915 "k	10.5	8.6	7.7	6.6	5.6	4.8	4.1	3.6	3.1	2.7	2.4	2.1	1.8	1.6
13 - 0 - 0	4 - #9	18,789 "k	16.4	14.1	12.6	10.8	9.2	8.0	6.9	6.0	5.3	4.7	4.2	3.7	3.3	3.0
13 - 4 - 0	4 - #9	23,412 "k	16.4	14.7	13.3	12.2	11.2	10.1	8.8	7.7	6.8	6.0	5.4	4.8	4.3	3.9
13 - 8 - 0	6 - #9	28,150 "k	16.5	14.8	13.4	12.2	11.3	10.4	9.7	9.1	8.3	7.4	6.6	5.9	5.3	4.8

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32LB32

Prestressed Concrete
LEDGER BEAM 32LB36

PHYSICAL PROPERTIES

A = 980 in.^{2} S_b = 6,406 in.^{3}
I = 107,163 in.^{4} S_t = 5,560 in.^{3}
Y_b = 16.73 in.   Wt.= 1,021 PLF
Y_t = 19.27 in.

Diagram labels:
- 2'-8"
- 8"
- 2'
- 1'-9½"
- 3'
- 1'-2½"
- 2"
- TOP BARS X FULL LENGTH
- LONGITUDINAL STEEL AS REQUIRED
- #4 STIRRUPS AS REQUIRED
- (1) #4 X FULL LENGTH
- 4-0.60" DIA STRANDS
- 13-0.60" DIA STRANDS
- EXAMPLE OF 13-4-0 PATTERN

DESIGN DATA

1. Precast Strength @ 28 days = 6,000 PSI.
2. Precast Strength @ release = 4,000 PSI.
3. Precast Density = 150 PCF.
4. Strand = 0.60"Ø 270K Lo-Relaxation.
5. Ultimate moment capacity shown below is for full strand development & tension controlled section.
6. Maximum bottom tensile stress is $12\sqrt{f'c}$ = 930 PSI.
7. Flexural strength capacity is based on stress/strain strand relationships and is slightly variable.
8. Deflection limits were not considered when determining allowable loads in this table.
9. All superimposed live loads listed are controlled by ultimate flexural strength, not allowable stresses.
10. All superimposed load is treated as live load in the flexural strength analysis.   To determine the allowable live load if the amount of superimposed dead load is known use the following conversion method...

$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

11. If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
12. The concrete strength at release of prestress force increases to 4,500 psi for more than 18 strands.
13. The concrete strength at release of prestress force increases to 5,000 psi for more than 24 strands.
14. Load values to the left of the solid line are controlled by torsional section property limits.
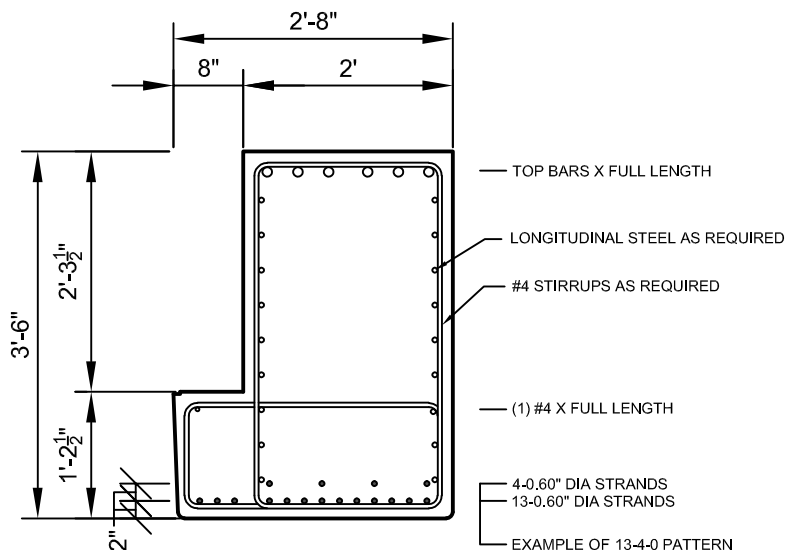15. Load values to the right of the solid line are controlled by ultimate moment capacity.

ALLOWABLE SUPERIMPOSED LIVE LOADS (KLF)			IBC 2012 & ACI 318-11 (1.2 D + 1.6 L)														
Strand Pattern	Top Bars	Moment Capacity	SPAN														
			24'	26'	28'	30'	32'	34'	36'	38'	40'	42'	44'	46'	48'	50'
8 - 0 - 0	2 - #9	13,620 "k	8.9	7.6	6.4	5.5	4.7	4.1	3.6	3.1	2.7	2.4	2.1	1.9	1.6	1.5
13 - 0 - 0	4 - #9	21,571 "k	14.5	12.5	10.6	9.2	8.0	7.0	6.1	5.4	4.8	4.3	3.8	3.4	3.1	2.8
13 - 4 - 0	4 - #9	27,015 "k	15.7	14.4	13.2	11.7	10.2	8.9	7.9	7.0	6.2	5.6	5.0	4.5	4.1	3.7
13 - 8 - 0	6 - #9	32,617 "k	15.8	14.4	13.3	12.3	11.4	10.7	9.7	8.6	7.7	6.9	6.2	5.6	5.1	4.6
13 - 13 - 0	6 - #9	38,252 "k	16.0	14.5	13.4	12.4	11.5	10.7	10.1	9.5	9.0	8.2	7.4	6.7	6.1	5.6

11/2020

32LB36

Prestressed Concrete
LEDGER BEAM 32LB42

PHYSICAL PROPERTIES

A = 1124 in.^{2} S_b = 8,676 in.^{3}
I = 169,876 in.^{4} S_t = 7,577 in.^{3}
Y_b = 19.58 in.   Wt.= 1,171 PLF
Y_t = 22.42 in.

TOP BARS X FULL LENGTH
LONGITUDINAL STEEL AS REQUIRED
#4 STIRRUPS AS REQUIRED
(1) #4 X FULL LENGTH
4-0.60" DIA STRANDS
13-0.60" DIA STRANDS
EXAMPLE OF 13-4-0 PATTERN

DESIGN DATA

1. Precast Strength @ 28 days = 6,000 PSI.
2. Precast Strength @ release = 4,000 PSI.
3. Precast Density = 150 PCF.
4. Strand = 0.60"Ø 270K Lo-Relaxation.
5. Ultimate moment capacity shown below is for full strand development & tension controlled section.
6. Maximum bottom tensile stress is $12\sqrt{f'c}$ = 930 PSI.
7. Flexural strength capacity is based on stress/strain strand relationships and is slightly variable.
8. Deflection limits were not considered when determining allowable loads in this table.
9. All superimposed live loads listed are controlled by ultimate flexural strength, not allowable stresses.
10. All superimposed load is treated as live load in the flexural strength analysis.   To determine the allowable live load if the amount of superimposed dead load is known use the following conversion method...

$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

11. If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
12. The concrete strength at release of prestress force increases to 4,500 psi for more than 24 strands.
13. The concrete strength at release of prestress force increases to 5,000 psi for more than 28 strands.
14. Load values to the left of the solid line are controlled by torsional section property limits.
15. Load values to the right of the solid line are controlled by ultimate moment capacity.

ALLOWABLE SUPERIMPOSED LIVE LOADS (KLF)

Strand Pattern	Top Bars	Moment Capacity	SPAN													
			30'	32'	34'	36'	38'	40'	42'	44'	46'	48'	50'	52'	54'	56'
13 - 0 - 0	4 - #9	25,781 "k	11.0	9.6	8.4	7.4	6.5	5.8	5.2	4.6	4.1	3.7	3.4	3.0	2.8	2.5
13 - 4 - 0	6 - #9	32,875 "k	14.3	12.4	10.9	9.6	8.6	7.6	6.8	6.1	5.5	5.0	4.6	4.1	3.8	3.4
13 - 8 - 0	6 - #9	39,287 "k	15.2	14.1	13.1	11.7	10.4	9.3	8.4	7.5	6.8	6.2	5.6	5.1	4.7	4.3
13 - 13 - 0	6 - #9	46,588 "k	15.3	14.2	13.2	12.4	11.7	11.0	10.1	9.1	8.2	7.5	6.8	6.3	5.7	5.3
13 - 13 - 4	8 - #9	52,216 "k	15.3	14.2	13.3	12.4	11.7	11.0	10.5	9.9	9.4	8.5	7.8	7.1	6.5	6.0

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32LB42