Oldcastle Precast®
Oldcastle Precast, Inc. Phone (509) 536-3300 Fax (509) 536-3313
922 N Carnahan Rd., Spokane Valley, WA 99212

BEAMS & COLUMNS

Precast, prestressed beams and columns are plant fabricated building components used to support other elements of a structural system. They are an integral part of any complete precast system, but can also be used easily with any combination of materials.

A wide variety of beam and column shapes and finishes gives the designer flexibility to suit the needs of each structure.

Precast/Prestressed Concrete Beams and Columns offer these advantages:

1 Cost Saving
The efficiency of prestressing plus the controlled environment of plant fabrication add up to project construction savings.

2 Time Saving
Beams and columns are quickly installed as needed and are immediately ready to support other portions of the structure.

3 Quality
The clean, accurate lines of plant produced products and the durability of concrete provide beams and columns that can be exposed to view and the weather. No costly and complicated "cover up" subsystems are required.

4 Permanence
High resistance to fire, weather, corrosion and deterioration allows precast beams and columns to be in service long after other types of materials have had to be repaired or replaced.

5 Design Simplicity
Load tables can be used for common design situations. For special applications or loading conditions, consult a Central Pre-Mix Prestress Co. representative for assistance in using these products.

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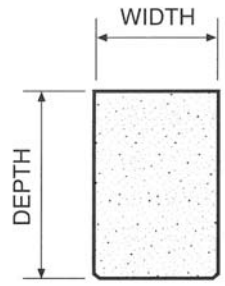
RECTANGULAR BEAMS

Rectangular beams are the most common shape to design and fabricate. The dimensions shown in the section properties table are for standard sizes. However, any combination of width and depth may be specified.



SECTION PROPERTIES						
WIDTH	DEPTH	A_g in.^{2}	I_x in.^{4}	Y_b in.	S in.^{3}	WT P.L.F.
1'-0"	2'-0"	288	13,824	12.00	1152	300
1'-0"	2'-8"	384	32,768	16.00	2048	400
1'-0"	3'-0"	432	46,656	18.00	2592	450
1'-4"	2'-0"	384	18,432	12.00	1536	400
1'-4"	2'-8"	512	43,691	16.00	2731	533
1'-4"	3'-4"	640	85,333	20.00	4267	667

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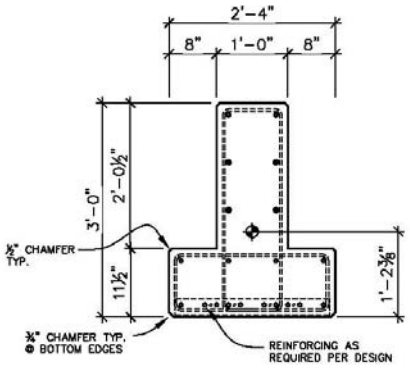
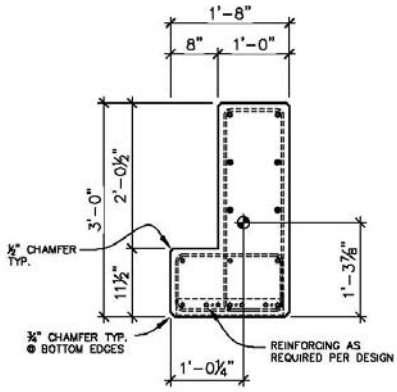
INVERTED TEE AND LEDGER BEAMS

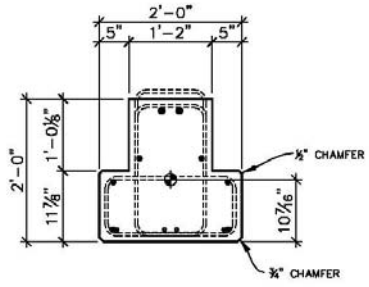
Inverted tee and ledger beams are advantageous where minimum story height and maximum clear distance between floor is important. Inverted tee ledger beam use can result in greater economy due to reduced overall building height. They are often used with Double Tee floors and roof. The dimensions shown are for standard inverted tee and ledger beam shapes. Beams depths and bearing ledge elevations can be varied to accommodate various loading and floor or roof requirements.



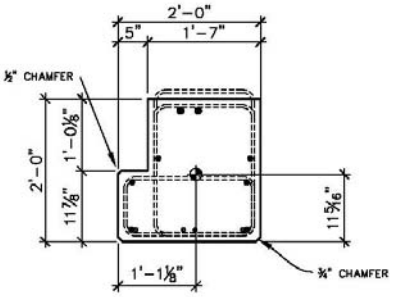
Area: 614.925201 sq in
Perimeter: 125.948488 in
Bounding box: X: −13.999860 -- 13.999860 in
Y: 0.000000 -- 35.999640 in
Centroid: X: 0.000000 in
Y: 14.346140 in
Moments of inertia: X: 194374.380429 sq in sq in
Y: 24401.637842 sq in sq in
Product of inertia: XY: 0.000000 sq in sq in
Radii of gyration: X: 17.779042 in
Y: 6.299388 in
Principal moments (sq in sq in) and X−Y directions about centroid:
I: 67815.558530 along [1.000000 0.000000]
J: 24401.637842 along [0.000000 1.000000]



Area: 523.051119 sq in
Perimeter: 110.241538 in
Bounding box: X: −9.999860 -- 9.999940 in
Y: 0.000000 -- 35.999640 in
Centroid: X: 12.248739 in
Y: 15.857399 in
Moments of inertia: X: 190334.892081 sq in sq in
Y: 15819.947198 sq in sq in
Product of inertia: XY: −27907.258924 sq in sq in
Radii of gyration: X: 19.075992 in
Y: 5.499592 in
Principal moments (sq in sq in) and X−Y directions about centroid:
I: 60615.760312 along [0.981495 −0.191490]
J: 11369.181152 along [0.191490 0.981495]



Area: 454.237175 sq in
Perimeter: 94.578345 in
Bounding box: X: −12.000000 -- 12.000000 in
Y: 0.000000 -- 24.021405 in
Centroid: X: 0.000000 in
Y: 10.437732 in
Moments of inertia: X: 70232.307825 sq in sq in
Y: 16344.789874 sq in sq in
Product of inertia: XY: 0.000000 sq in sq in
Radii of gyration: X: 12.434466 in
Y: 5.998578 in
Principal moments (sq in sq in) and X−Y directions about centroid:
I: 20744.872832 along [1.000000 0.000000]
J: 16344.789874 along [0.000000 1.000000]



Area: 515.094202 sq in
Perimeter: 94.871238 in
Bounding box: X: 0.000000 -- 24.000000 in
Y: 0.000000 -- 24.021405 in
Centroid: X: 13.122966 in
Y: 11.323560 in
Moments of inertia: X: 90560.213382 sq in sq in
Y: 110025.852727 sq in sq in
Product of inertia: XY: −80365.010712 sq in sq in
Radii of gyration: X: 13.259446 in
Y: 14.615176 in
Principal moments (sq in sq in) and X−Y directions about centroid:
I: 27059.467726 along [0.832279 −0.554358]
J: 18774.140615 along [0.554358 0.832279]

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COLUMNS

Columns can be prestressed or conventionally reinforced. Prestressed columns may be more economical because higher strength prestressing strand can result in a reduction of conventional steel reinforcement. Prestressing offers distinct advantages when designing for handling.

All prestressed column interaction curves are based on a concrete strength of f'c = 5000 psi and (4)$^1/_2$" ∅ 270 ksi strand with an effective prestress force of 23.5 kips per strand. More strand can be added to the columns to satisfy a particular design requirement. Load capacity curves must be reduced by a Φ factor and a slenderness coefficient as required by the current ACI code.

COLUMN SIZE	COLUMN TYPE	NO. OF STRANDS OR REBARS
12" x 12"	PRESTRESSED	4-1/2" Ø 270 K.S.I.
	REINFORCED	4 - #6 GRADE 60
14" x 14"	PRESTRESSED	4-1/2" Ø 270 K.S.I.
	REINFORCED	4 - #7 GRADE 60
16" x 16"	PRESTRESSED	4-1/2" Ø 270 K.S.I.
	REINFORCED	4 - #8 GRADE 60
18" x 18"	PRESTRESSED	4-1/2" Ø 270 K.S.I.
	REINFORCED	4 - #9 GRADE 60
20" x 20"	PRESTRESSED	4-1/2" Ø 270 K.S.I.
	REINFORCED	4 - #9 GRADE 60

Note: All column interaction diagrams shown are based on the amount of steel noted in the table at the left.

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