64 CONCRETE BEAM DESIGN

ABSTRACT

This program designs rectangular or tee shaped reinforced concrete beams in accordance with the 1971 ACI Building code. The ultimate strength criteria is used by the program. Price $60.00

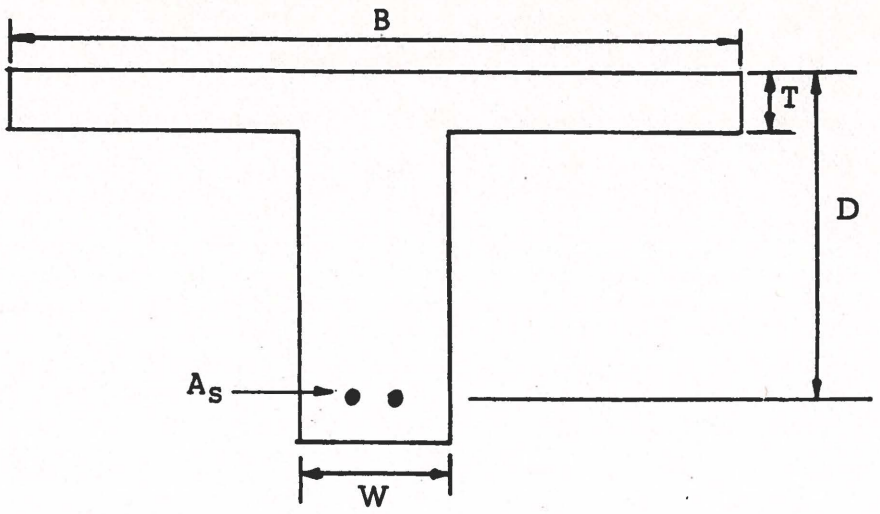
INPUT

General beam dimensions
Concrete and steel strengths
Design moments

OUTPUT

Minimum area of steel required
Maximum area of steel allowed
Ultimate moment capacity of section
Area of steel required for each moment

CONCRETE BEAM DESIGN (ULTIMATE)



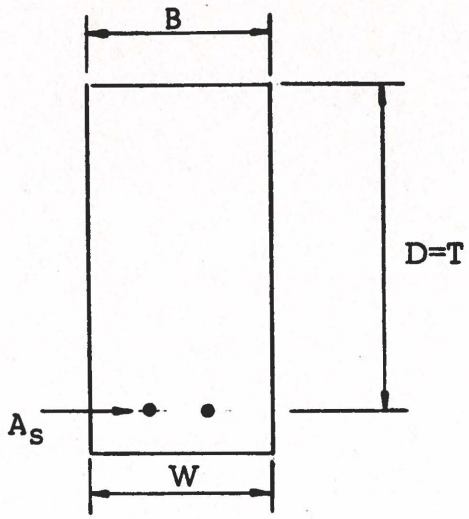
Data: C. P. 64

Width of compressive zone at top (B)	=	30	in.
Flange thickness - D if Rectangular - (T)	=	2.5	in.
Effective depth (D)	=	19	in.
Width of tension zone at bottom (W)	=	10	in.
Yield strength of flexural steel (f_y)	=	60	ksi
28 day compressive strength of concrete (f'_c)	=	4	ksi

Computations:

Area of minimum steel = $WD/5f_y$	=	0.6333	$in.^2$
Maximum steel allowed by ACI - $.75P_b$	=	6.1703	$in.^2$
Ultimate moment capacity of section (M_u)	=	467.3605	k-ft.
For ultimate moment M_x	=	300	k-ft.
Area of steel required (A_s)	=	3.7352	$in.^2$
For ultimate moment M_x	=	350	k-ft.
Area of steel required (A_s)	=	4.3980	$in.^2$
For ultimate moment M_x	=	400	k-ft.
Area of steel required (A_s)	=	5.1120	$in.^2$
For ultimate moment M_x	=	450	k-ft.
Area of steel required (A_s)	=	5.8930	$in.^2$
For ultimate moment M_x	=	500	k-ft.
Area of steel required (A_s)	=		$in.^2$
For ultimate moment M_x	=	432	k-ft.
Area of steel required (A_s)	=	5.6030	$in.^2$

CONCRETE BEAM DESIGN (ULTIMATE)



Data: C. P. 64

Width of compressive zone at top (B)	=	10	in.
Flange thickness - D if Rectangular - (T)	=	13.3	in.
Effective depth (D)	=	13.3	in.
Width of tension zone at bottom (W)	=	10	in.
Yield strength of flexural steel (f_y)	=	60	ksi
28 day compressive strength of concrete (f'_c)	=	4	ksi

Computations:

Area of minimum steel = $WD/5f_y$	=	0.4433	$in.^2$
Maximum steel allowed by ACI - $.75P_b$	=	2.8320	$in.^2$
Ultimate moment capacity of section (M_u)	=	137.6500	k-ft.
For ultimate moment M_x	=	125	k-ft.
Area of steel required (A_s)	=	2.5145	$in.^2$
For ultimate moment M_x	=	110	k-ft.
Area of steel required (A_s)	=	2.1504	$in.^2$
For ultimate moment M_x	=	100	k-ft.
Area of steel required (A_s)	=	1.9207	$in.^2$
For ultimate moment M_x	=		k-ft.
Area of steel required (A_s)	=		$in.^2$
For ultimate moment M_x	=		k-ft.
Area of steel required (A_s)	=		$in.^2$
For ultimate moment M_x	=		k-ft.
Area of steel required (A_s)	=		$in.^2$