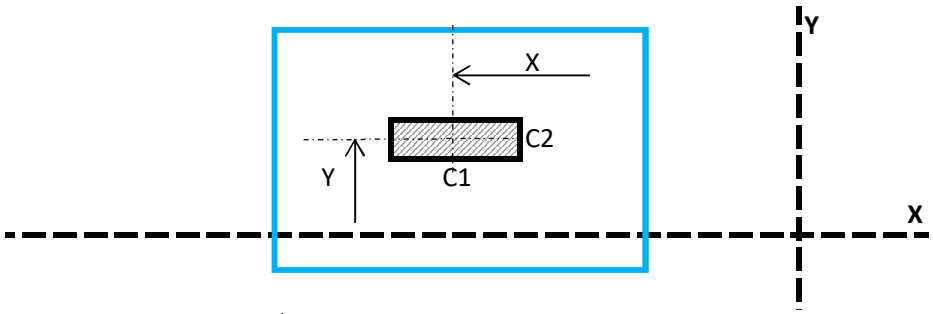
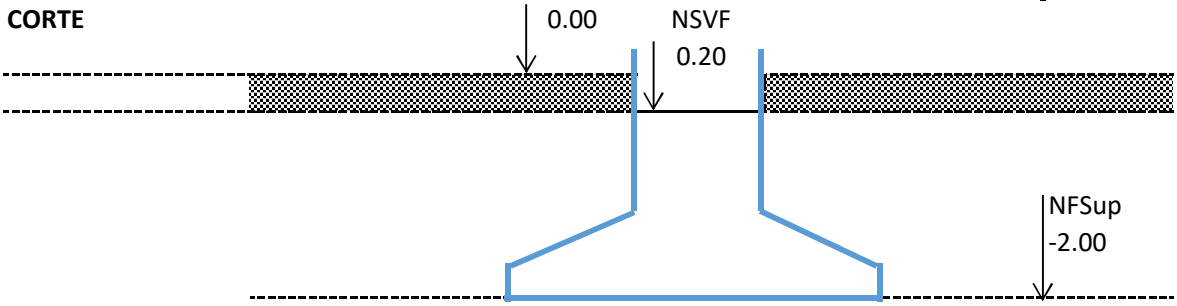
EJEMPLO BASE CENTRADA CON MOMENTO

PLANTA



CORTE



	P		L		D	
N	100.0	t	25.0	t	75.0	t
M	40.0	tm	10.0	t	30.0	t

C1	40	cm
C2	40	cm

FUND SUPERFICIAL

σ adm	20	t/m2	2.0	kg/cm2
Hormigon	3000	t/m2	300	kg/cm2 **H-30**
acero	42000	t/m2	4200	kg/cm2 **AND 420**
E acero	2E+06	kg/cm2		

p=L	0.25	q	carga util
g=D	0.75	q	carga permanente
q=g+p	P		carga total

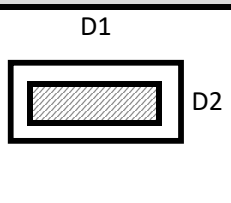
U1= 1.4D
U2= 1.2D+1.6L

FACTORIZACION DE CARGAS

N.L	25.0	t	**NU.1**	105.0	t normal util
N.D	75.0	t	**NU.2**	**130.0**	t normal permanente
M.L	10.0	tm	**MU.1**	42.0	tm momento util
M.D	30.0	tm	**MU.2**	**52.0**	tm momento permanente

COLUMNAS - TRONCO

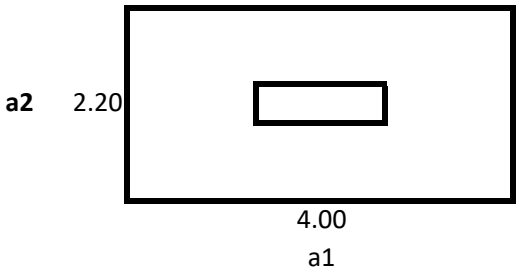
D1	45 cm	**area tr**	2025 cm2	
D2	45 cm			

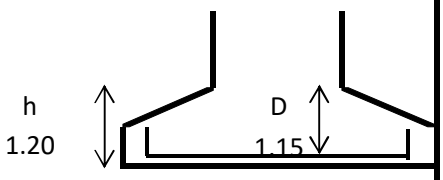


FUNDACION SUPERFICIAL - con MOMENTO

GEOMETRIA

e=	M/1.1*N	calculo de excentricidad
e=	0.36 m	
a1>=	6e	eleccion de dimension de a1 para tener diagrama trapecial
a1>=	2.18 m	
a1=	4.00 m	adopto a1
a2=	(1.1*N/a1*σ) (1 + 6e/a1)	calculo de a2 para diagrama trapecial
a2=	2.13 m	
a2=	2.20 m	adopto a2 (redondeo de a2 de calculo)
D=	(a-d)/3	altura de la base
D1=	1.18 m	
D2=	0.58 m	
D=	1.20 m	adopto altura base (redondeo de max de calculo de h)
h=	D-r	altura base menos el recubrimiento
h=	1.15 m	
rel. lados	1.82 <2	verificacion relacion de lados (aprox 2 o menor)
z=	0.2*D	calculo de talon (min 0.20m)
z=	0.24 m	
z=	0.25 m	adopto altura talon





VERIFICACION DE TENSIONES

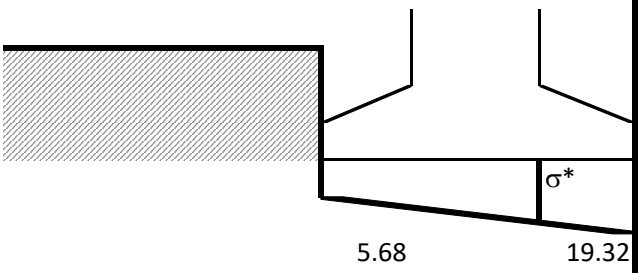
σN= 1.1N/(a1*a2) — tensiones debido al normal
σN= 12.50 t/m2

σM= 6*M/(a1^2*a2) — tensiones debido al momento
σM= 6.82 t/m2

σ1= σN + σM — tension maxima
σ1= 19.32 t/m2 — < σ adm

σ2= σN - σM — tension minima
σ2= 5.68 t/m2 — > 0

σ*= σ1-(σ1-σ2)*x1/a1
σ*= 13.27 t/m2



CALCULO DE TENSIONES MAYORADAS EFECTIVAS

σNU= NU/(a1*a2) — tensiones debido al normal mayorado
σNU= 14.77 t/m2

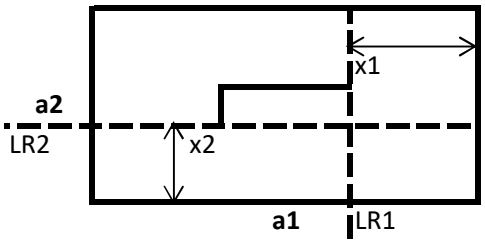
σMU= 6*MU/(a1^2*a2) — tensiones debido al momento mayorado
σMU= 8.86 t/m2

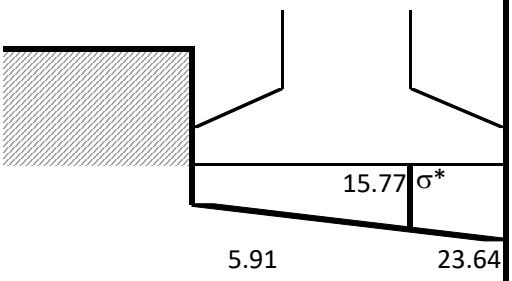
σ1U= σNU + σMU — tension maxima mayorada
σ1U= 23.64 t/m2

σ2U= σNU - σMU — tension minima mayorada
σ2U= 5.91 t/m2

σ*= σ1U-(σ1U-σ2U)*x1/a1
σ*= 15.77 t/m2

MOMENTOS MEDIANTE LINEAS DE ROTURA





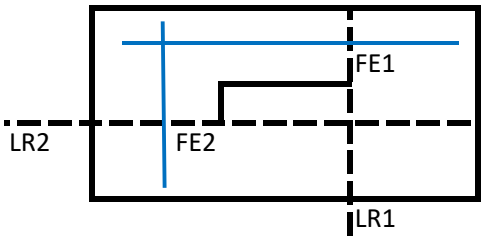
x1= (a1-d1)/2
x1= 1.78 m

x2= (a2-d2)/2
x2= 0.88 m

MLR1= $(x1^2*a2*(\sigma*+2\sigma1U))/6$ momento total respecto de linea de rotura 1
MLR1= 72.83 tm

MLR2= $(x2^2*a1*(\sigma1U+\sigma2U))/4$ momento total respecto de linea de rotura 2
MLR2= 22.62 tm

ARMADURAS BASE



ϕ= 0.9 coeficiente de reduccion para bielas y tensores

As1= 1.2*MLR1/(0.8*h*ϕ*Fy) armadura respecto a LR1 paralela a a2
As1= 25.1 cm2
As1= 11.42 cm2/m
se adopta As1 **fi** 16 As1 adoptado
cant 13
sep 17 cm

As2= MLR2/(0.8*h*ϕ*Fy) armadura respecto a LR2 paralela a a1
As2= 7.8 cm2
As2= 1.95 cm2/m
se adopta FE2 **fi** 10 As2 adoptado
cant 11
sep 39 cm
adopto minima ϕ10c/20