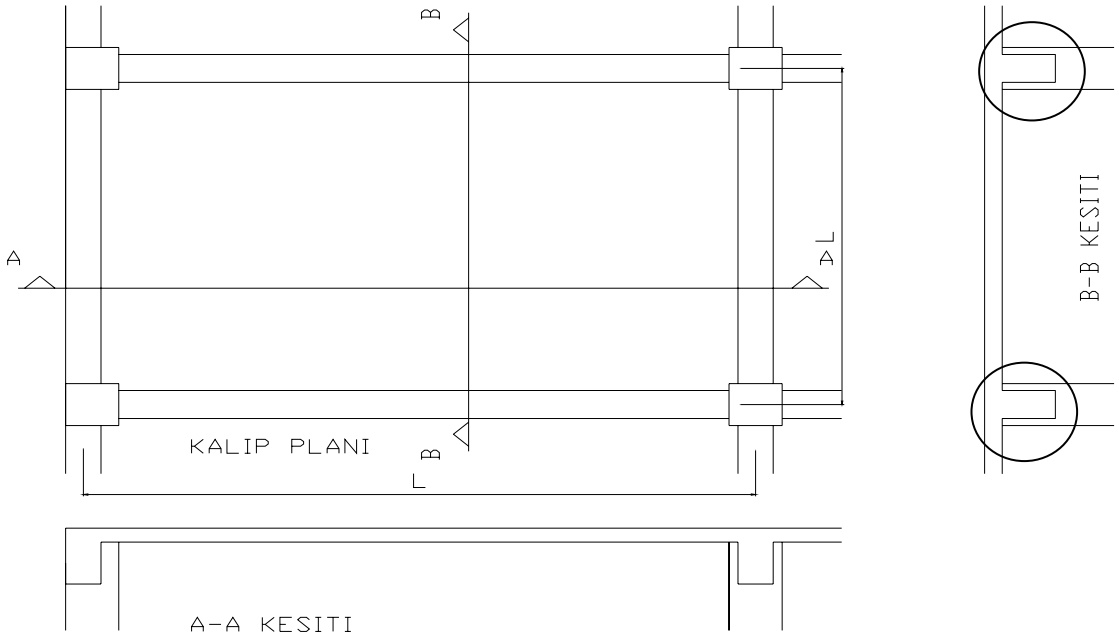
Betonarme

- Yrd.Doç.Dr. Meltem ŞAHİN

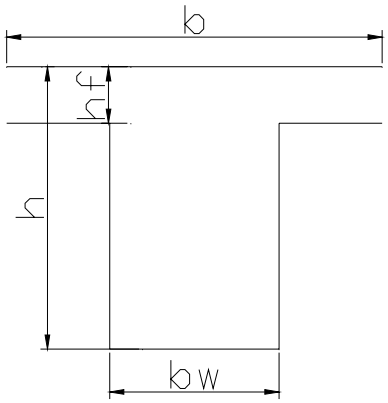
  Mimar Sinan Üniversitesi Mimarlık Fakültesi Mimarlık Bölümü
  Yapı Mühendisliği Bilim Dalı

- Araş.Gör. Mehmet Selim ÖKTEN

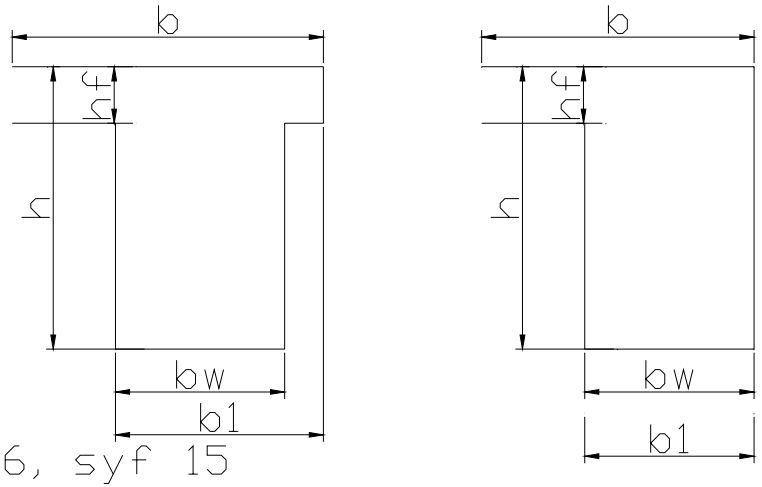
  Mimar Sinan Üniversitesi Mimarlık Fakültesi Mimarlık Bölümü
  Yapı Mühendisliği Bilim Dalı


B
A
A
L
B
KALIP PLANI
L
A-A KESITI
B-B KESITI

SIMETRIK DURUM



SIMETRIK OLMAYAN DURUM



TS-500 Madde 6-36, syf 15

b=bw+0.2lp b=b1+0.1lp

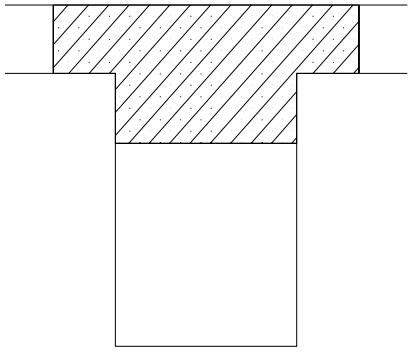
lp=1.0l (tek açiklikli, basit mesnetli kiris)

lp=0.8l (sürekli kiris kenar açikligi)

lp=0.6l (sürekli kiris iç açiklik)

lp=1.5l (konsol kiris)

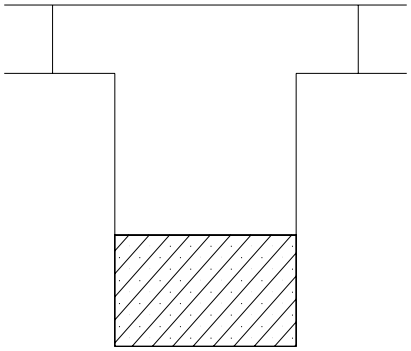
POZITIF MOMENT
(Ustte basinc altta cekme)



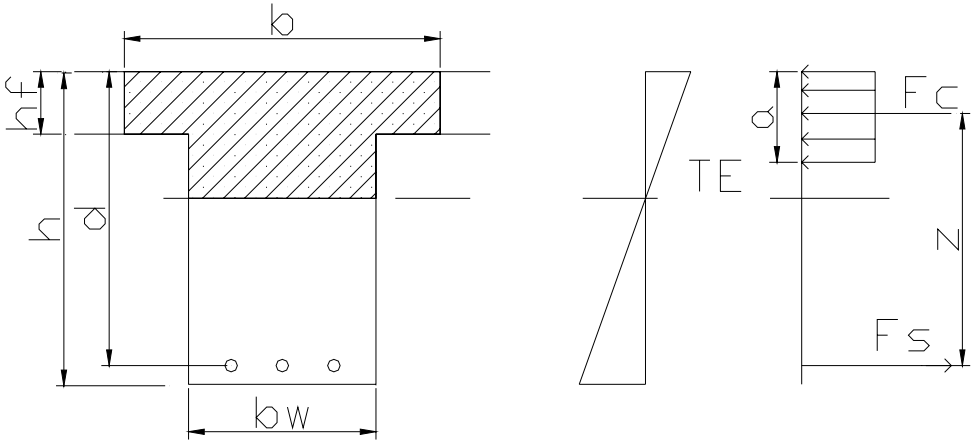
Basinç Bölgesi Tabla Disinda ise
TABLALI KESIT HESABI

Basinç Bölgesi Tabla Içinde ise
DIKDORTGEN KESIT HESABI

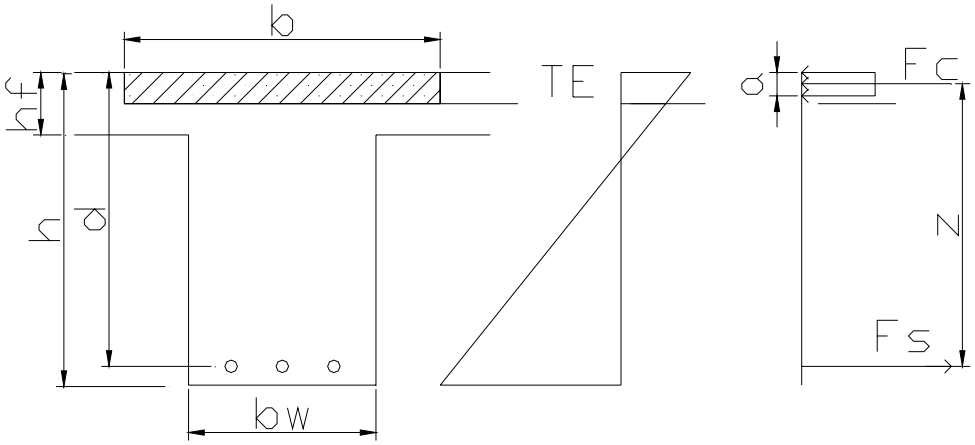
NEGATIF MOMENT
(Ustte cekme altta basinc)



DIKDORTGEN KESIT HESABI



TARAFSIZ EKSEN TABLANIN ALTINDA
tablali kesit hesabi yapilir.

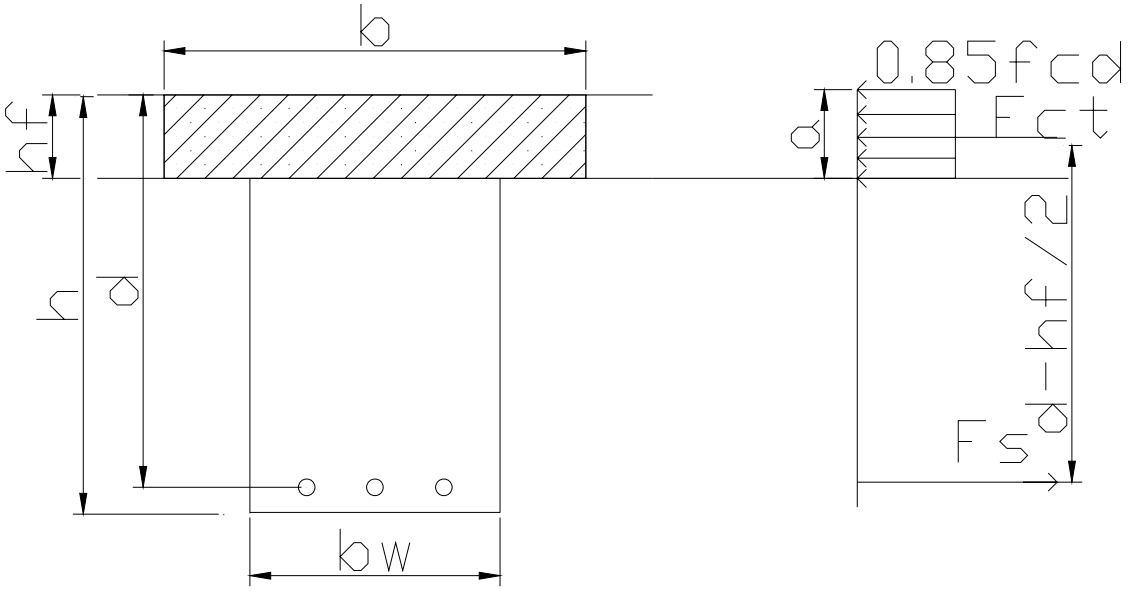


TARAFSIZ EKSEN TABLANIN ICINDE
bw=b alinip dikdortgen kesit hesabi yapilir.

TABLALI KESİT HESABI

- Sonuç: Tablalı kesit hesabı yapabilmek için önce Tarafsız Eksenin yeri belirlenir.
- Tablanın taşıyabileceği M_{rt} hesaplanır.
- $M_{rt}>M_d$ ise TE tablanın içindedir. Bu durumda, bw=b alınarak dikdörtgen kesit hesabı yapılır.
- $M_{rt}<M_d$ ise TE gövdedir.Yani TE tablanın dışındadır.
- Bu durumda tablalı kesit hesabı yapılır.

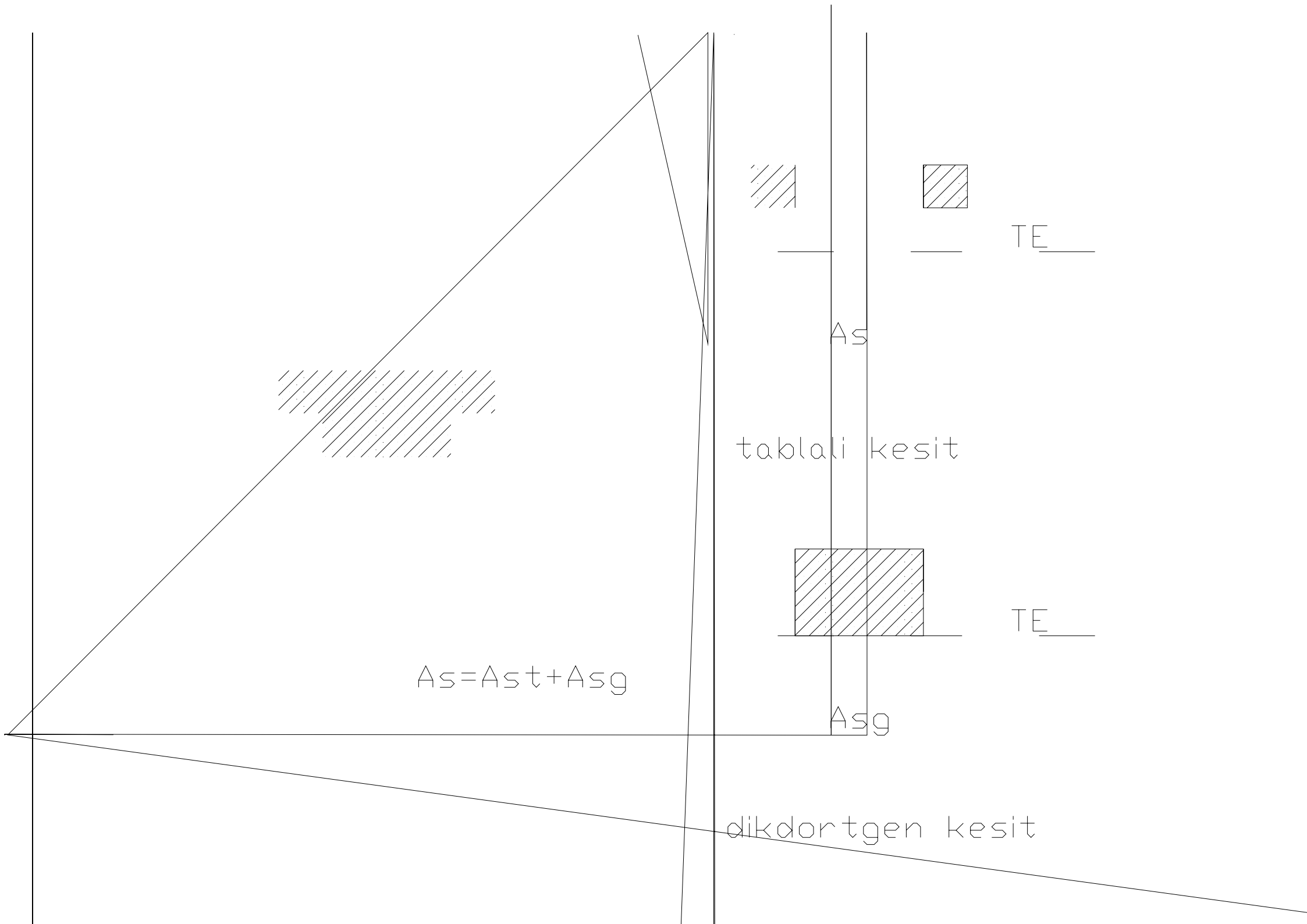
TABLANIN TASIYABILECEGI MOMENTIN HESABI



Mrt=0.85.fcd.b.hf(d-hf/2)

Mrt>=Md ise bw=b dikdortgen kesit hesabi

Mrt<Md ise tablali kesit hesabi


TE
As
tablali kesit
TE
As=Ast+Asg
Asg
dikdortgen kesit

TABLANIN TASIYABILECEGI MOMENTIN HESABI

Denge için: Fct=Fst

2(0.85fcdhf(b-bw)/2)=Astfyd

Ast=0.85fcdhf(b-bw)/fyd

Tablaya dusen moment Mrt=0.85fcdhf(b-bw)(d-0,5hf)

Mrt=Ast fyd (d-0,5hf)

Govdeye dusen moment=Mgovde=Md-Mrt

Mgovde=Md-Ast fyd (d-0,5hf)

Govde donatisi dikdortgen kesit hesabi ile hesaplanir.

Toplam donati tabla ve govde icin hesaplanan donatilarin toplamidir.

bir baska yol:

Tablaya dusen moment Mrt

Mrt=Fct.(d-hf/2) =2(0.85fcdhf(b-bw)/2)(d-hf/2)

K=(b-bw)d^2/2

tablodan ρ,j

Ast=ρ(b-bw)d

Govdeye dusen moment=Mgovde=Md-Mrt

Govde donatisi dikdortgen kesit hesabi ile hesaplanir.

Toplam donati tabla ve govde icin hesaplanan donatilarin toplamidir.

=91936 kNcm = 919,4 tm

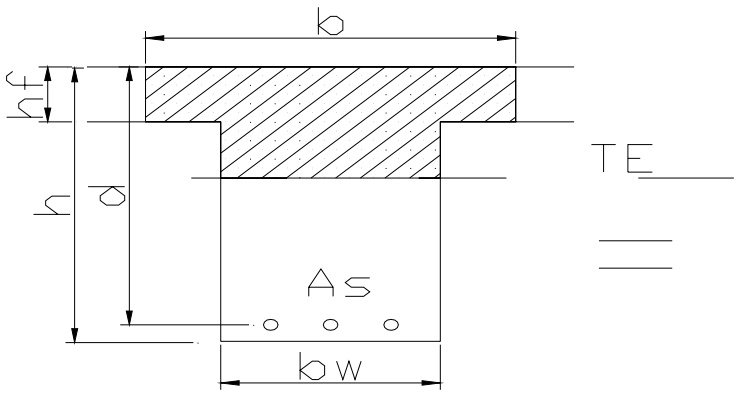
Mrt>Md TE tablanin icinde

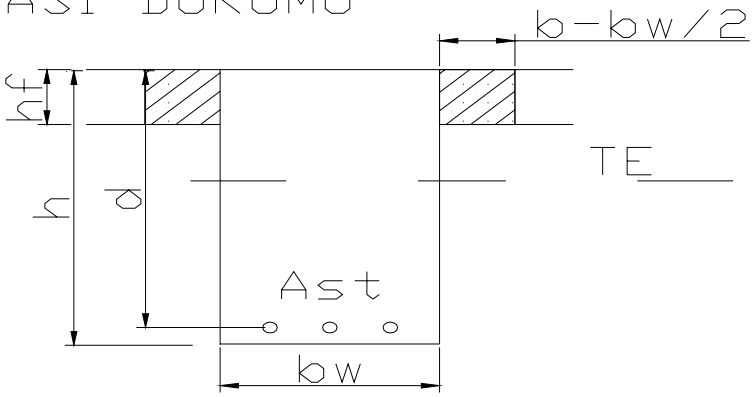
bw=130 cm alinip dikdortgen kesit hesabi yapilacak.

C30, S420 icin K=10,2 , ρ=0,003

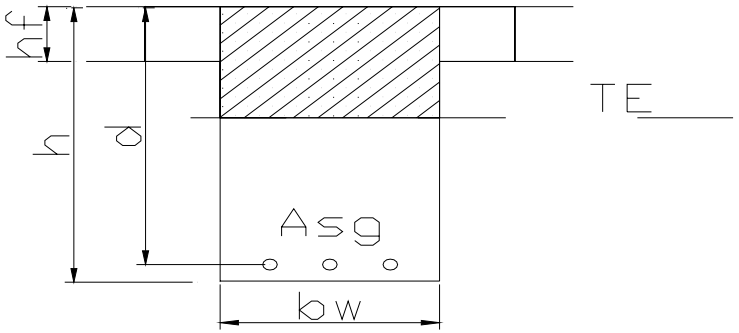
As=ρbd=0,003.130.56=21,8 cm2 6ϕ22 (2 sira)

KESITIN TABLALI CALISMASI DURUMU





tablali kesit



dikdortgen kesit

As=Ast+Asg

2) Md=1000 kNm

Mrt=919,4 kNm (ornek 1)

Mrt<Md TE >hf tablali kesit hesabi yapilmalidir.

Ast=0,85.fcd.(b-bw).hf/fyd

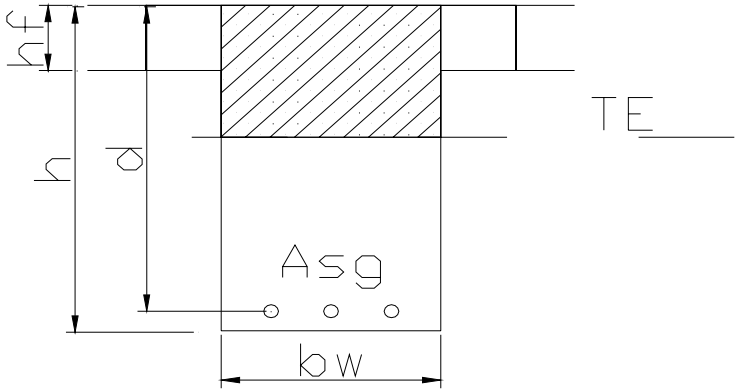
Ast=0,85.2.(130-25).8/36,5-

Mg=Md−Mrt =1000−742,56=257,44 kNm

K=25.56^2/25744=3,04 ρ=0,01

Asg=ρbd =0,01.25.56=14cm2

As=Ast+Asg=39,12+14=53,12 cm2 9ϕ28



dikdortgen kesit