İLLER BANKASI

İBE — 11[illegible]976
İLLER BANK[illegible]
TİP PROJELE[illegible]

KULE ÇIKIŞLI 4 HÜCRELİ 30-34,5 KV. TRANSFORMATÖR BİNASI

(SATIŞ İÇİN BASTIRILMIŞTIR)

İ Ç İ N D E K İ L E R

İLLER BANKASI
GENEL MÜDÜRLÜĞÜ MATBAASI
1 9 7 6

ENERJİ VE TABİÎ KAYNAKLAR BAKANLIĞI.	İLLER BANKASI ENERJİ DA. REİSLİĞİ
İLLER BANKASI BÖLGE MÜDÜRLÜĞÜ	YÜKLENİCİ

72/55

DEĞİŞİKLİK					
DEĞİŞİKLİK SEBEBİ					
DEĞİŞİKLİĞE AİT PROJEYİ YAPANIN	ADI VE SOYADI	ÜNVANI	ODA NO	TARİH	İMZA

30-34,5 kV 4 HÜCRELİ KULE ÇIKIŞLI TİP ÖLÇÜ VE TRANSFORMATÖR BİNASI MONTAJ PLÂNI

ÖLÇEK: 1/50

NO.LU PLÂN İPTÂL EDİLDİ

NO.LU PLÂN İPTÂL EDİLDİ

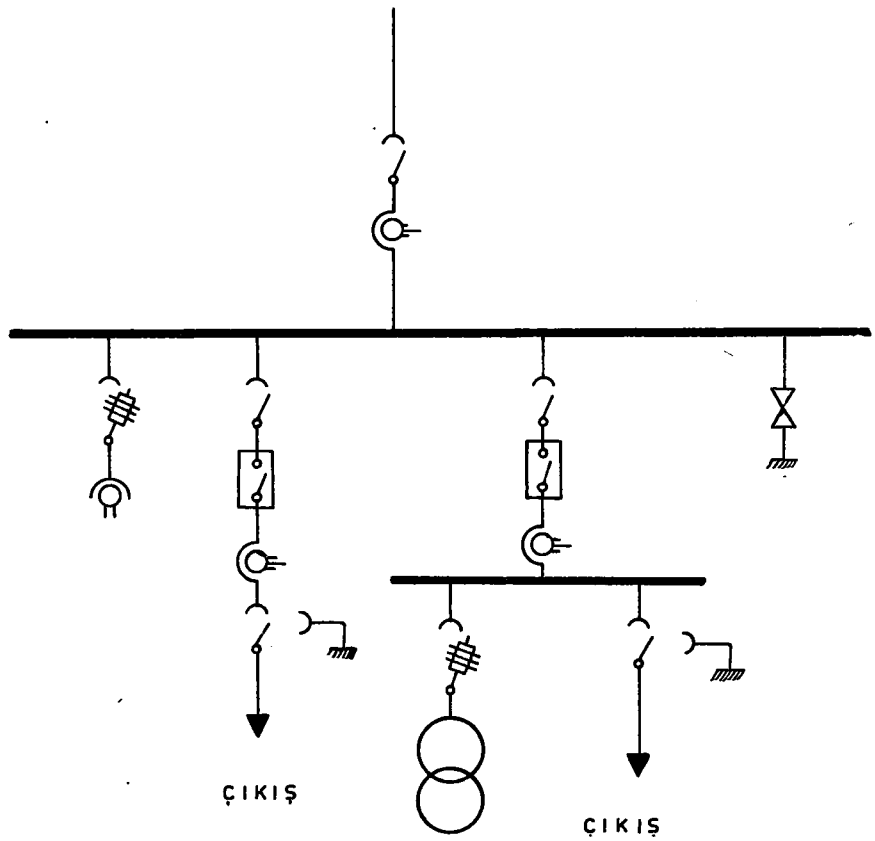
PROJEYİ YAPANIN ADI VE SOYADI	İMZA	İMZA TARİHİ
ELK. MÜH. NİMET GÜNER KONT. ELK.Y. MÜH. ADNAN OKTAÇ	N. Güner	29.4.1976
ÇİZEN: ZAFER YUMRUKLU		

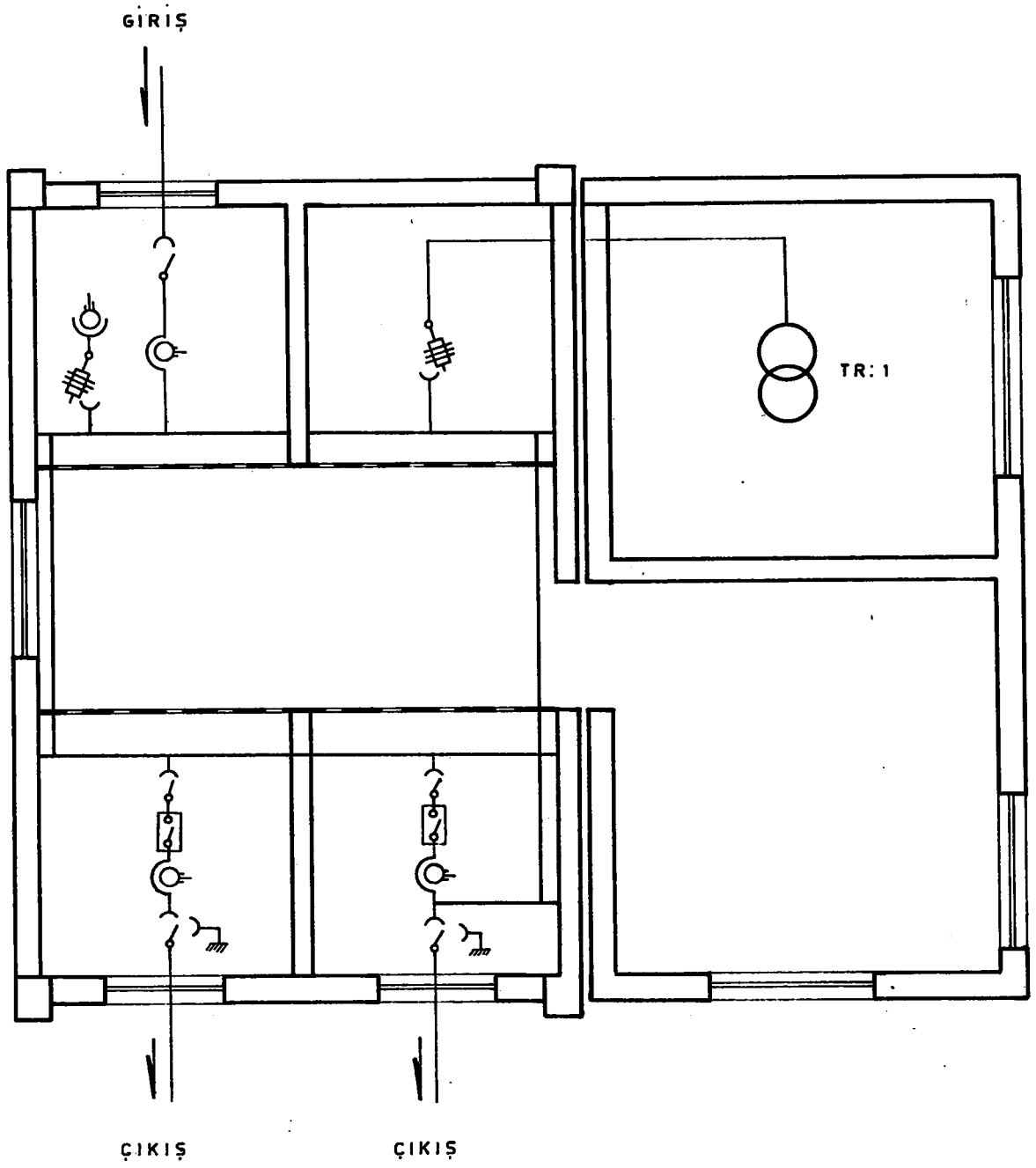
İLLER BANKASI
ENERJİ DAİRESİ
REİSLİĞİ

PLÂN NO: 116 1/43 a

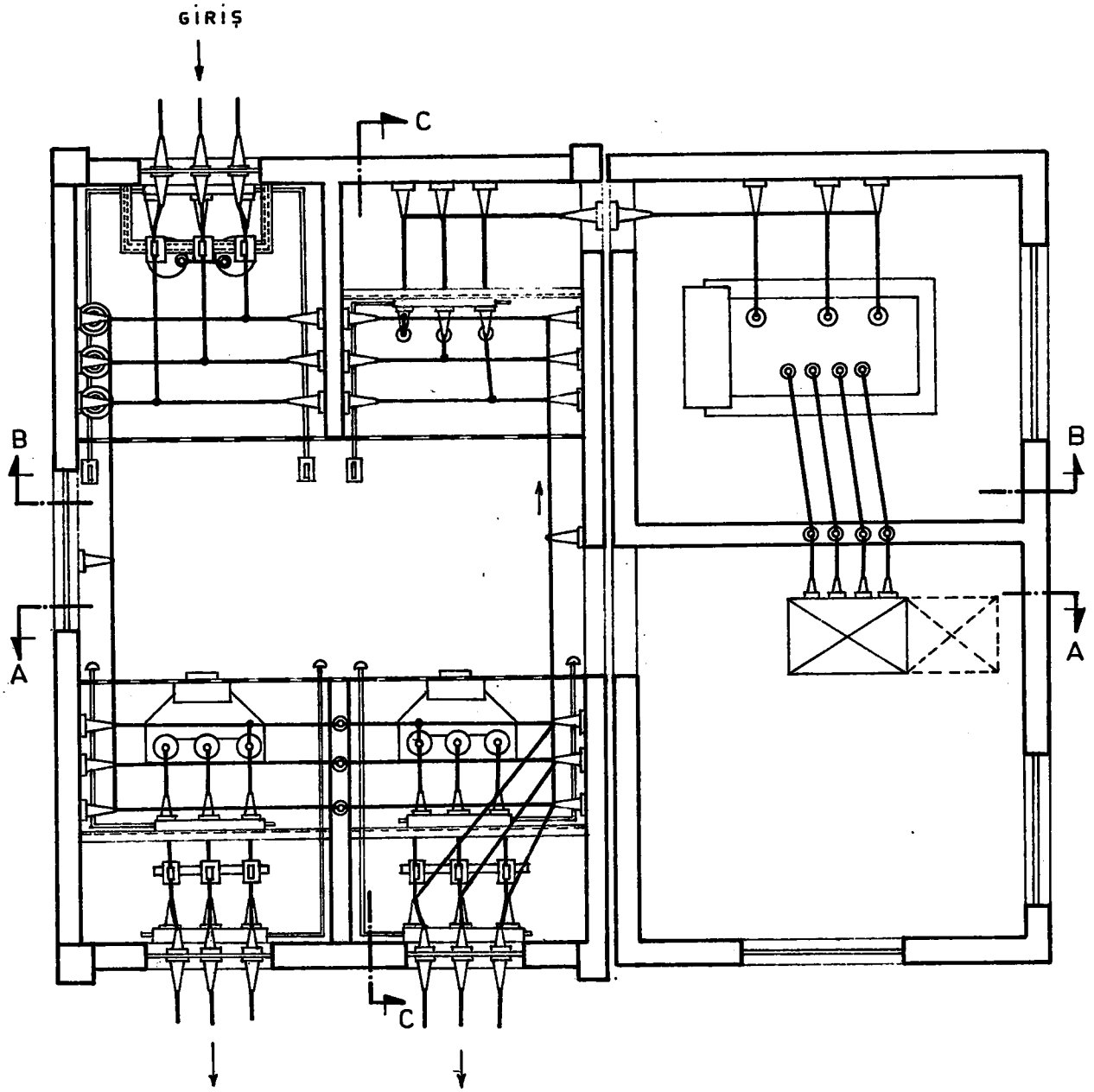
ARŞİV KAYIT NO:

0.55 m²

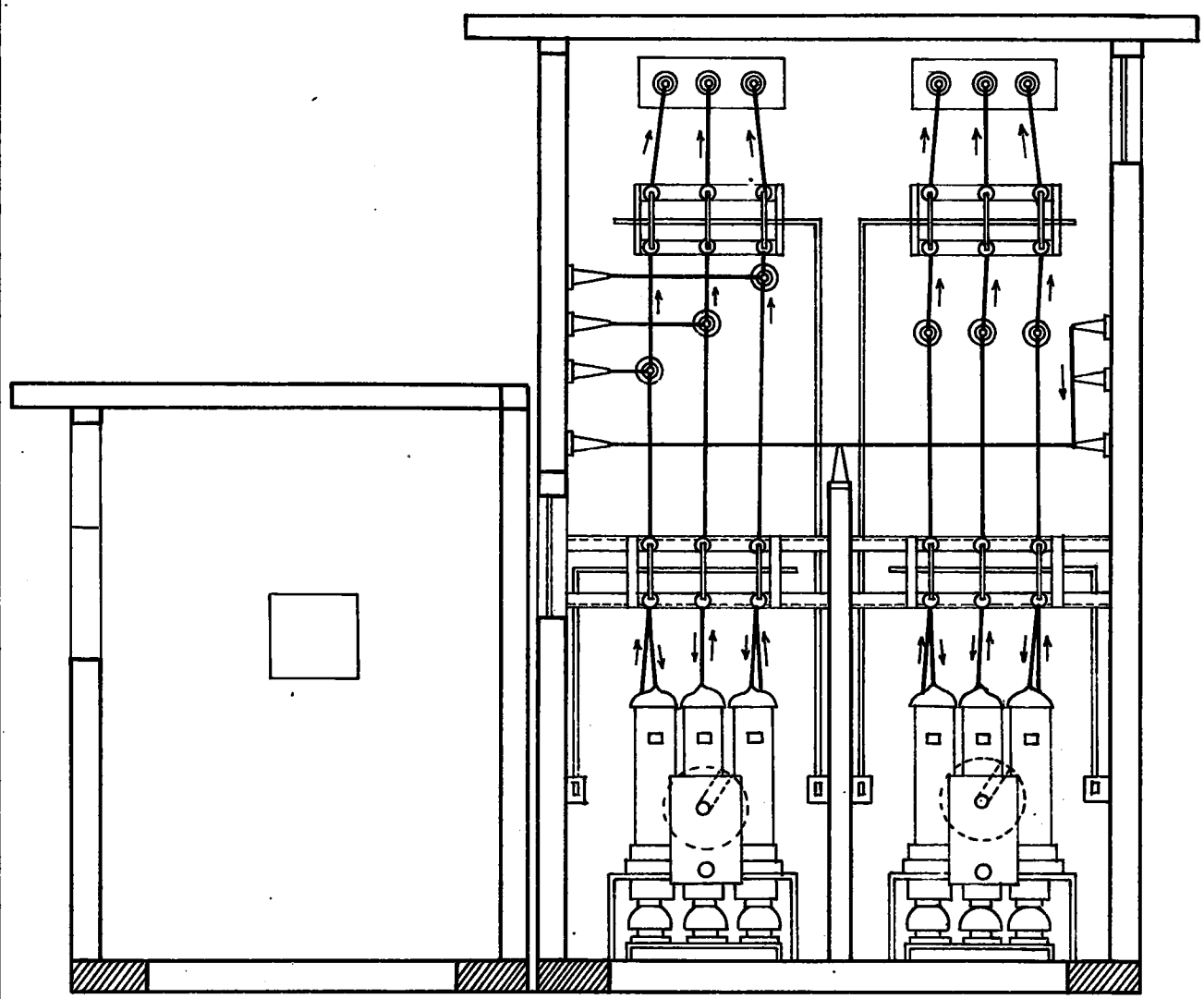

ÇIKIŞ
ÇIKIŞ



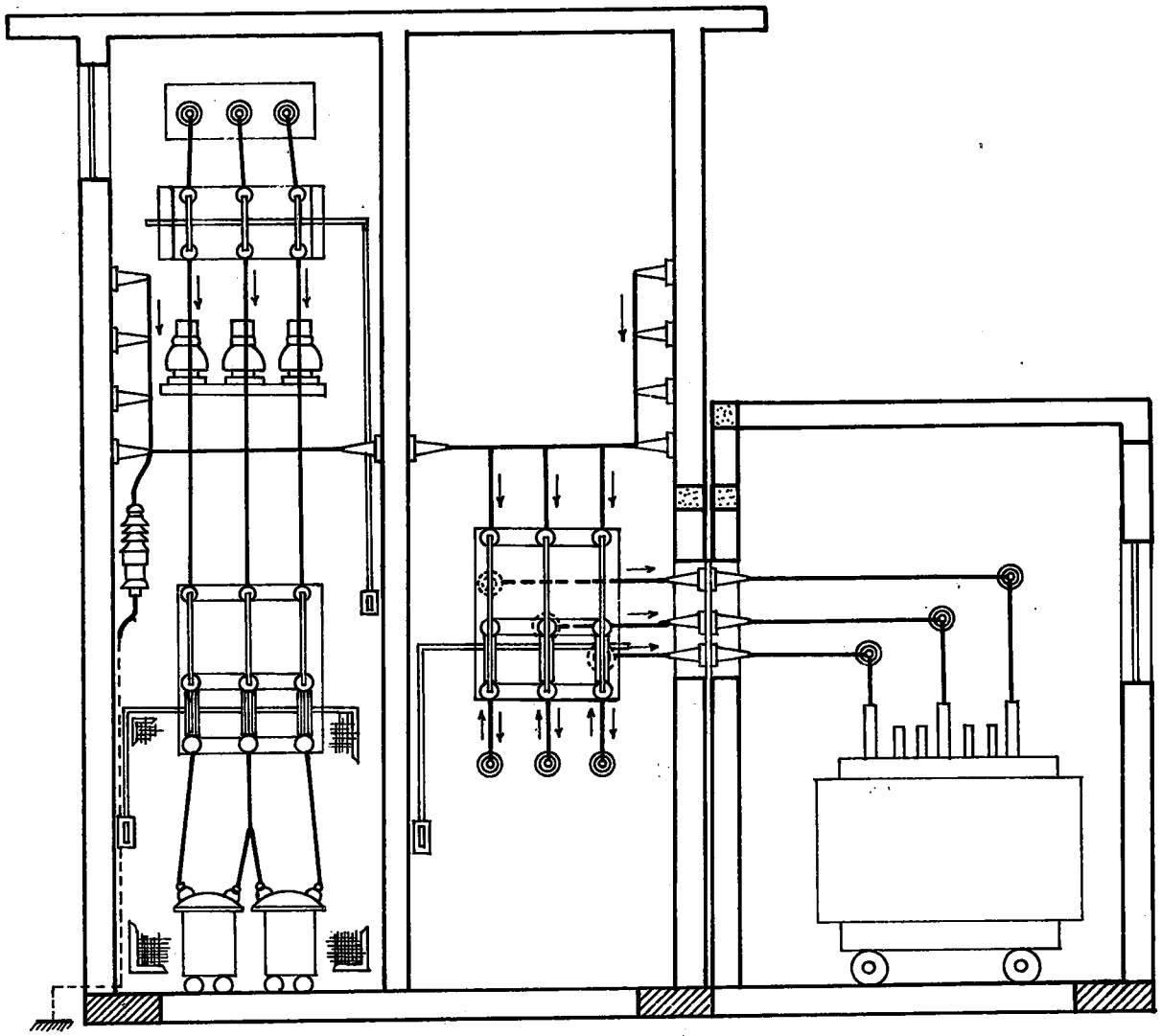
PLÂN Ölçek: 1/50



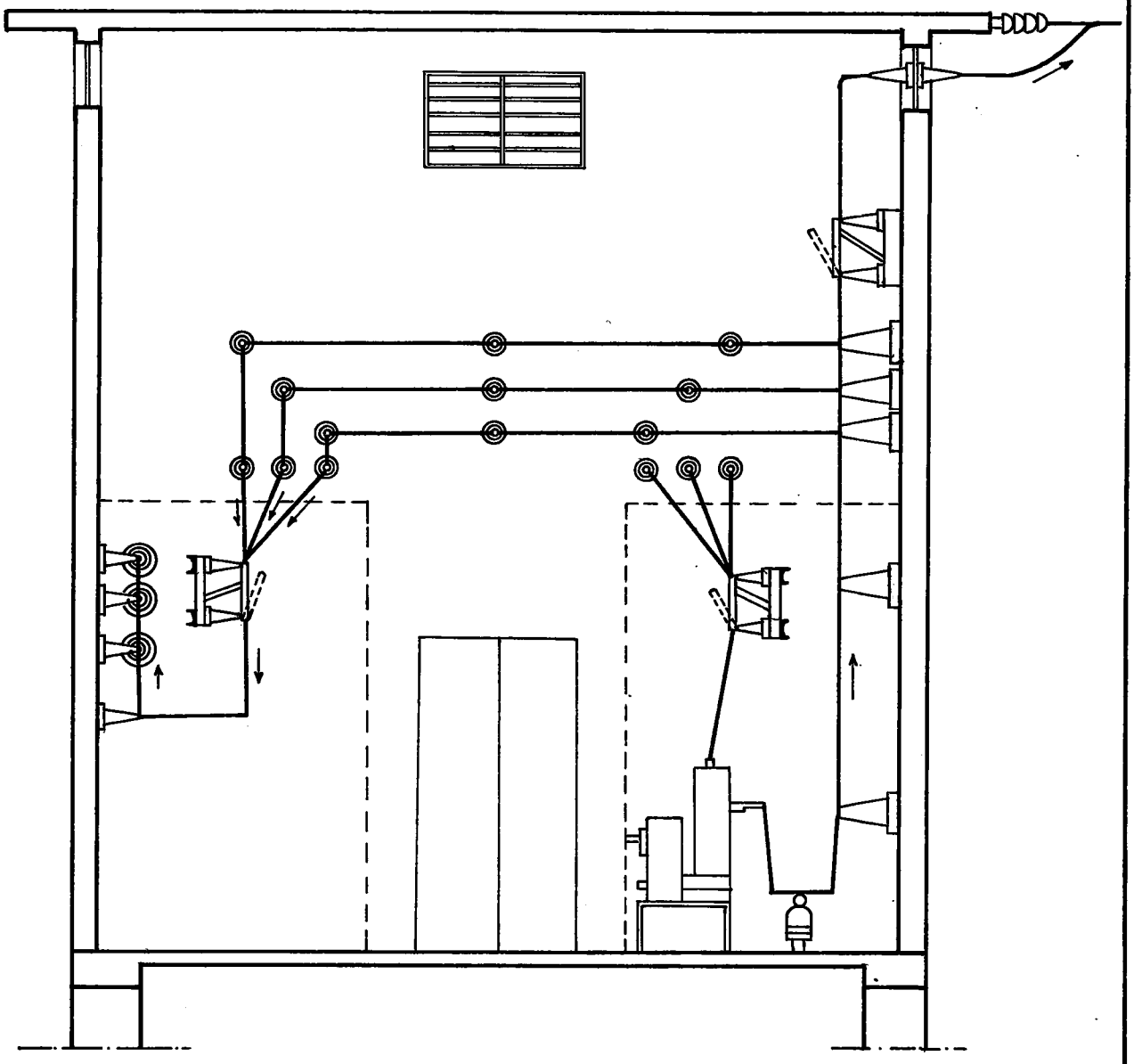
PLÂN Ölçek: 1/50



A_A KESİTİ Ölçek : 1/50



B_B KESİTİ Ölçek : 1/50



C _ C KESİTİ Ölçek : 1/50

ENERJİ VE TABİİ KAYNAKLAR BAKANLIĞI

İLLER BANKASI

72
55

DEĞİŞİKLİK	TARİH	İMZA
a)	16.7.975	
b)		

30_34,5 kV
4 HÜCRELİ KULE ÇIKIŞLI
TİP TRANSFORMATÖR BİNASI
MİMARİ PROJESİ

ÖLÇEK 1/50

NO.LU PLÂN İPTAL EDİLDİ

NO.LU PLÂN İPTAL EDİLDİ

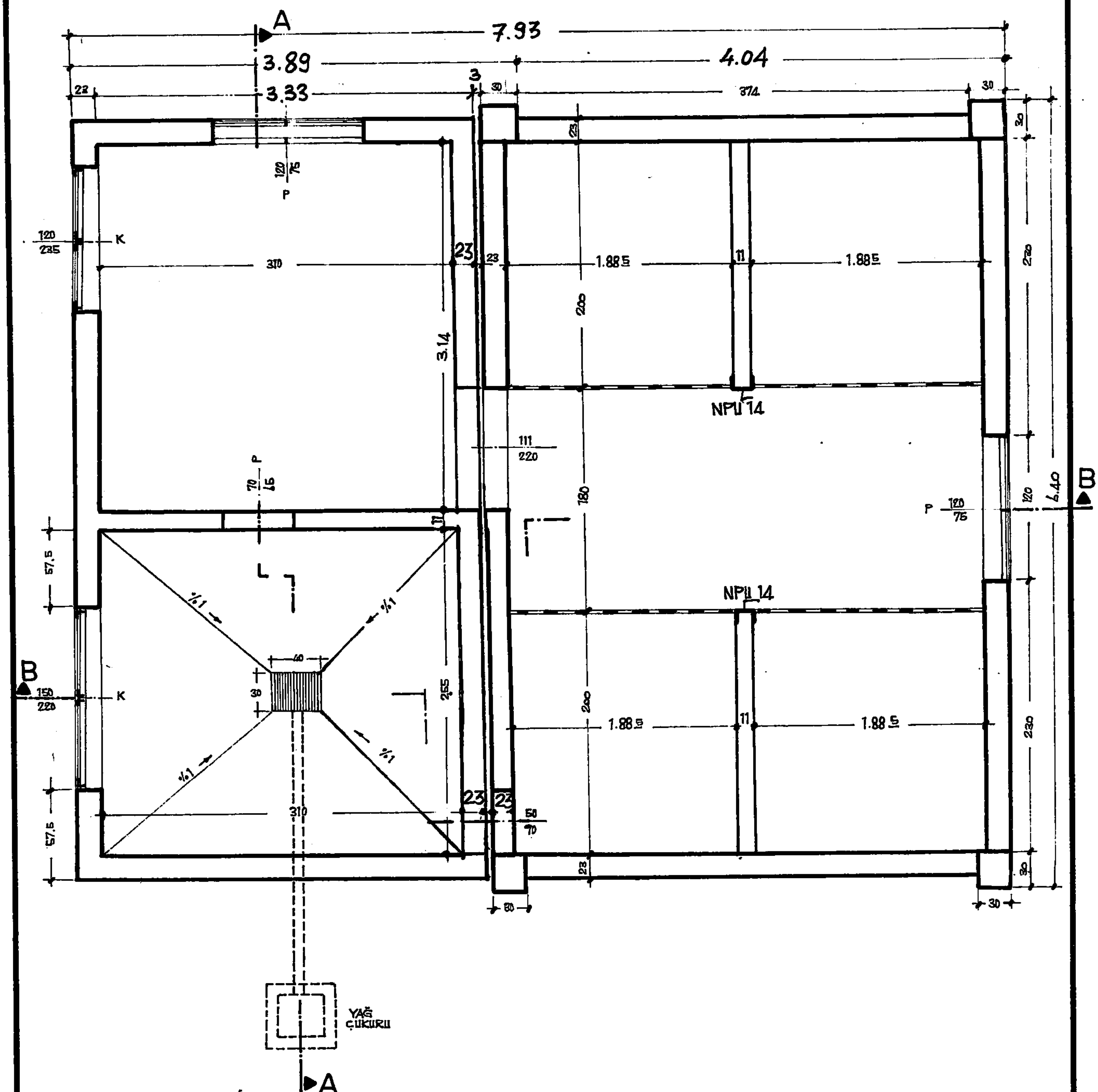
PROJEYİ YAPANIN, DİPL. NO. ÜNVANI, ADI, SOYADI	İMZA	İMZA TARİHİ
YÜK. İNŞ. MÜH ÇETİN PEKİNER ODA NO: 8730 - DİP. NO: 7163 TELEFON : 174701		
ÇİZEN :		

İLLER BANKASI
ENERJİ DAİRESİ
REİSLİĞİ

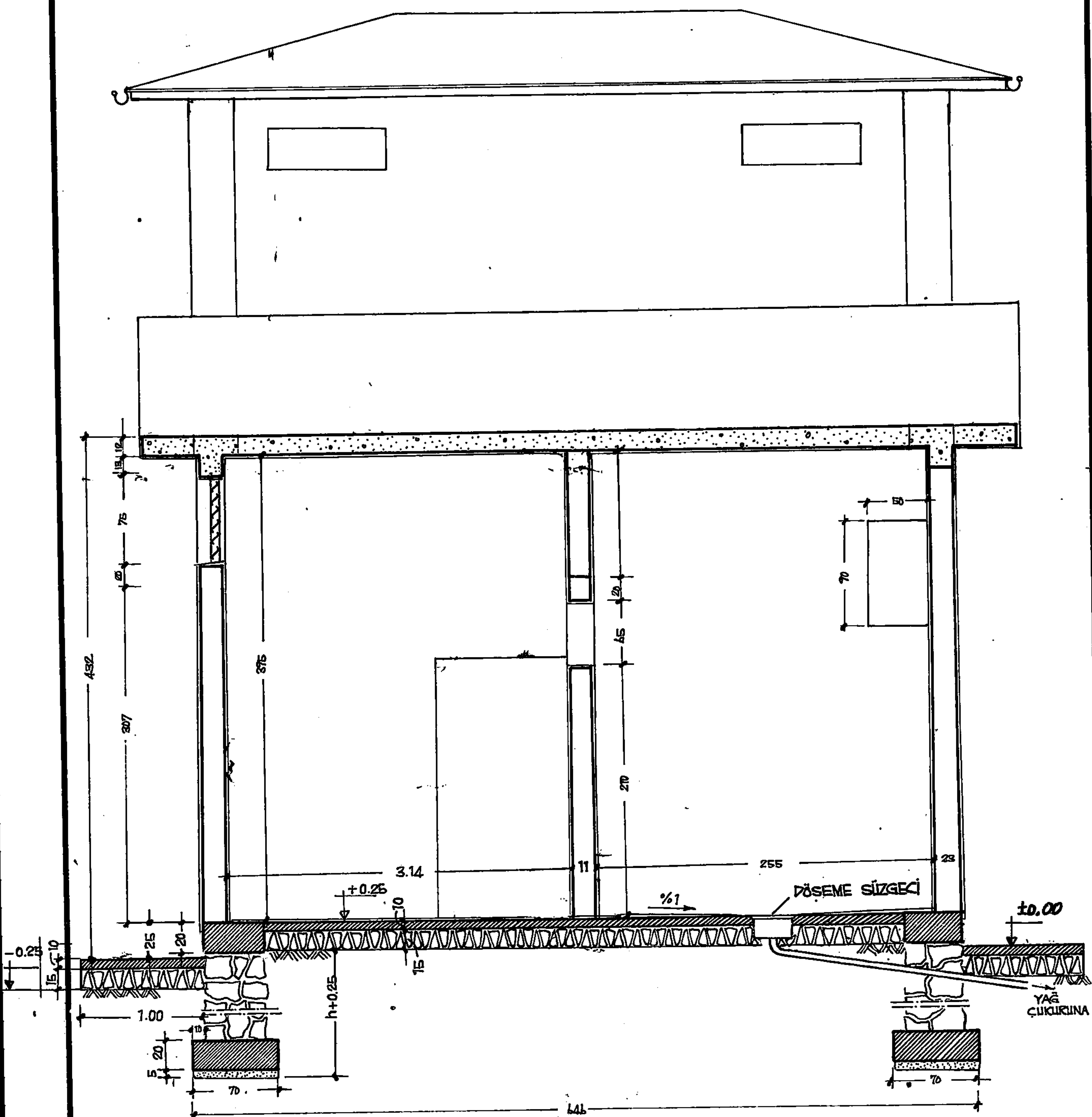
PLÂN NO
116_1/43

ARŞİV KAYIT NO

0.55m²

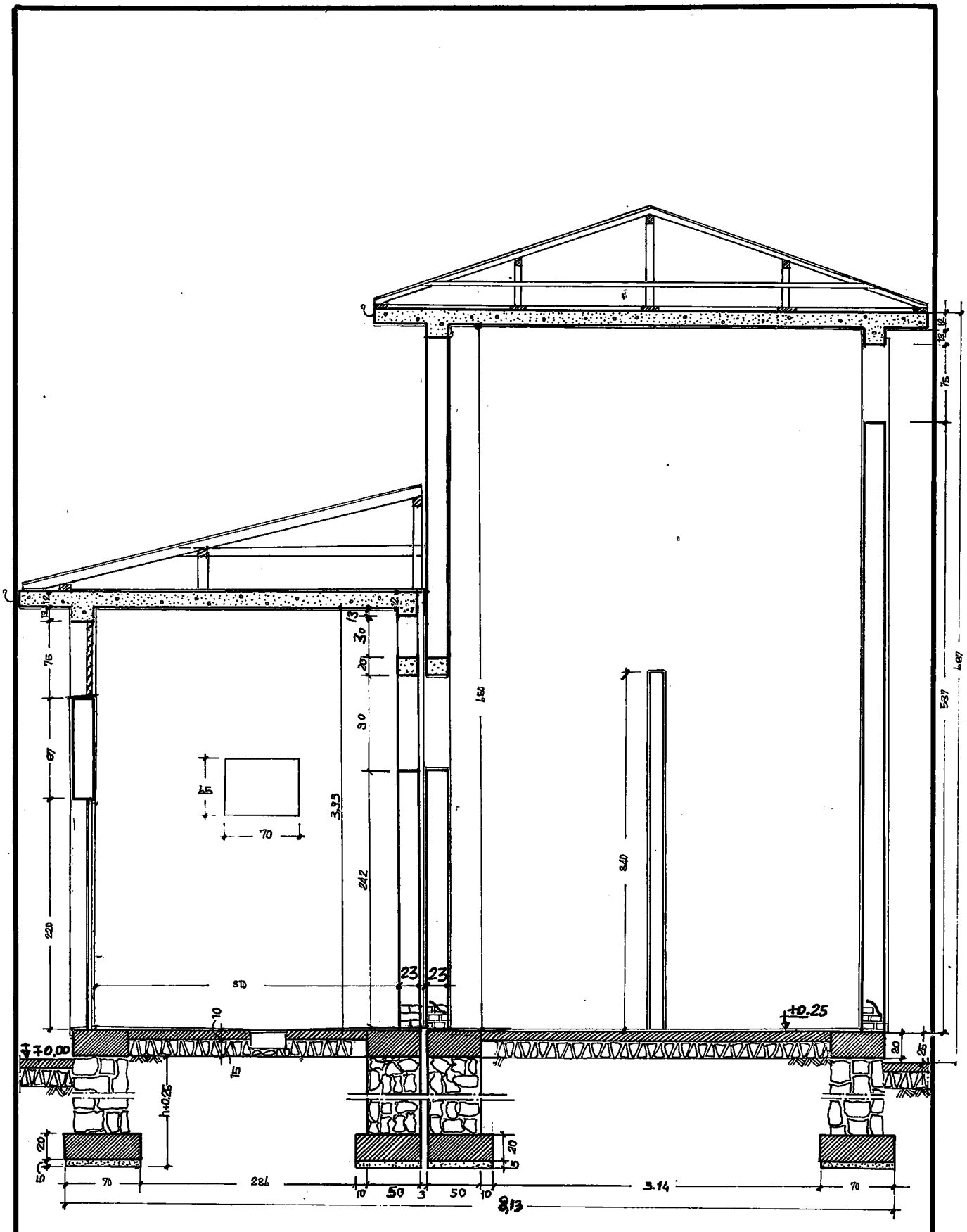

A
7.93
3.89
4.04
3.33
3
22
30
374
30
120/75
P
120/235
K
310
23
23
1.88 5
11
1.88 5
200
3.14
NPU 14
111/220
70/45
P
180
P 120/75
4.40
B
NPU 14
57,5
B
150/220
K
40
30
255
200
1.88 5
11
1.88 5
230
%1
310
23
23
50/70
57,5
30
30
YAĞ
ÇUKURU
A

PLÂN

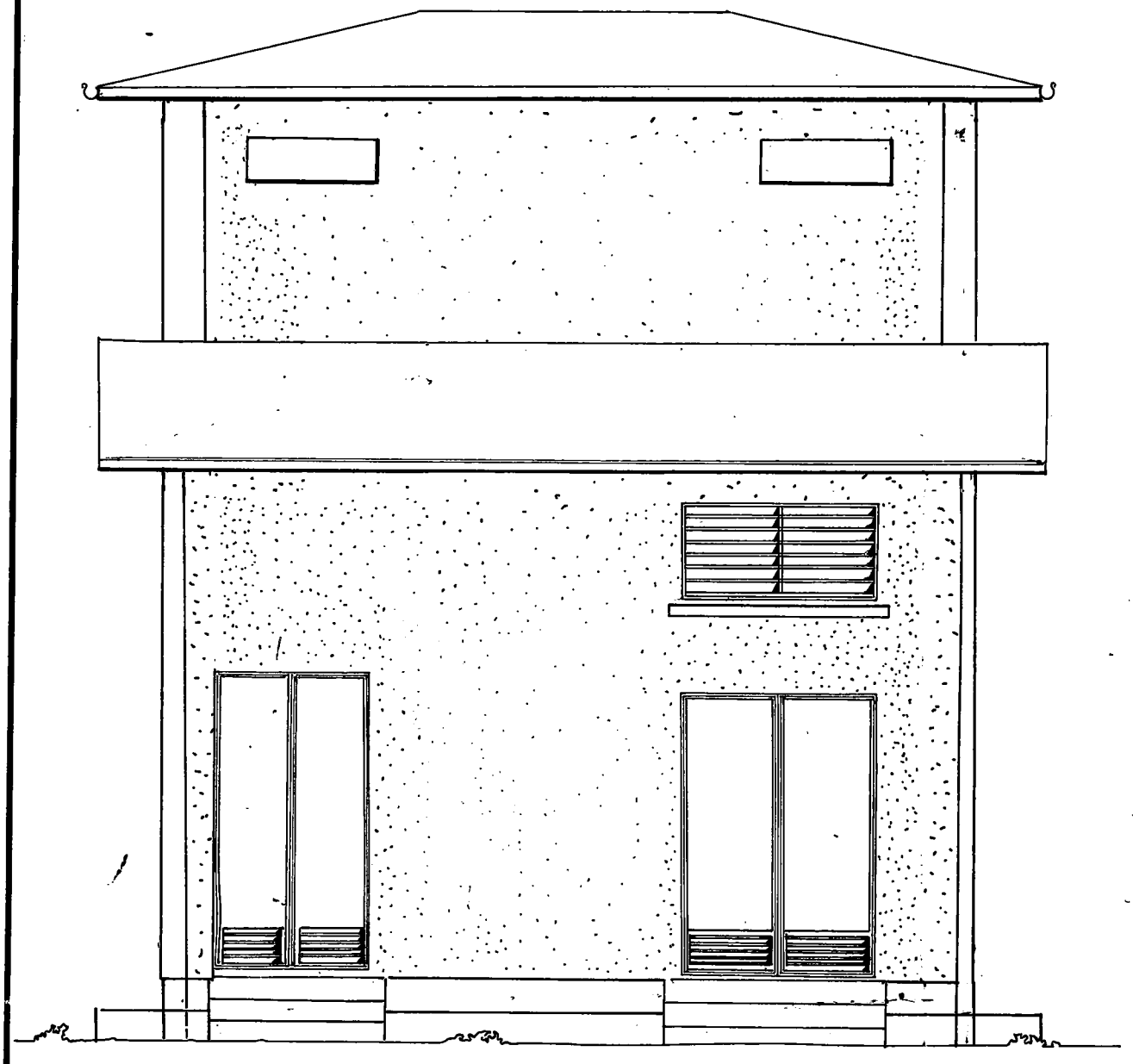


432
375
307
3.14
11
255
23
270
45
50
70
±0.25
DÖSEME SİZGECİ
%1
±0.00
-0.25
1.00
h+0.25
70
YAĞ ÇUKURUNA

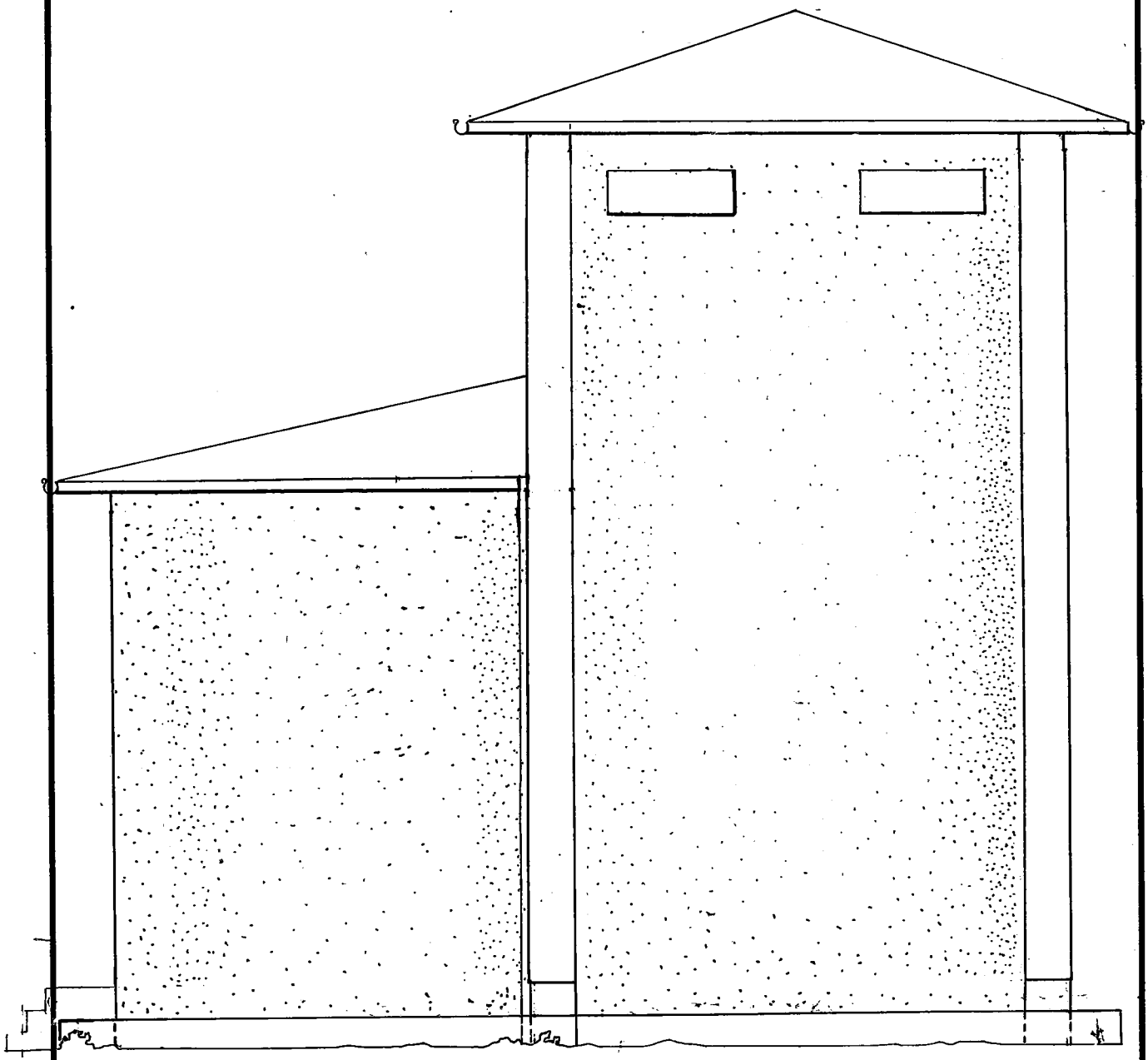
A-A KESİTİ



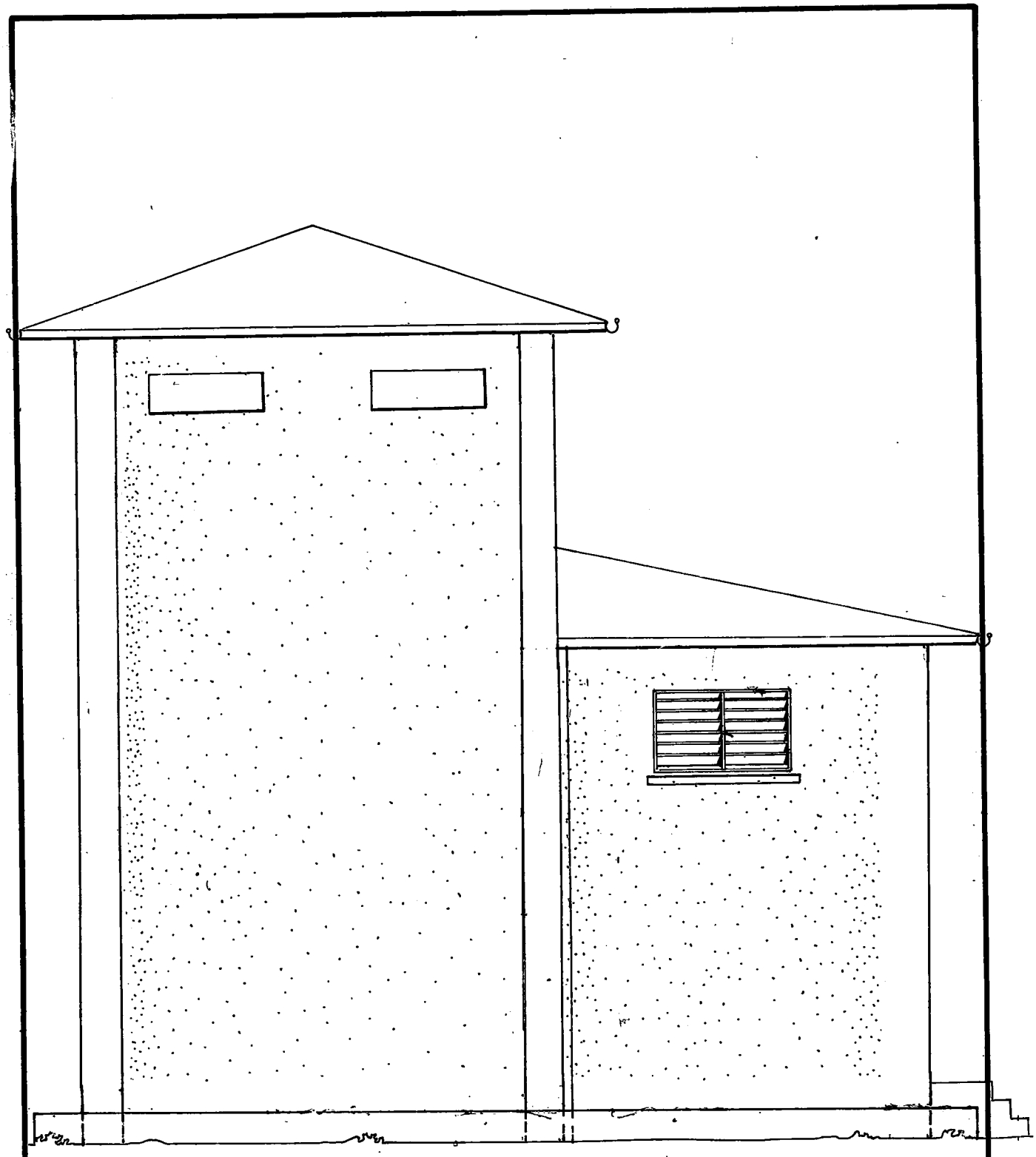
B-B KESİTİ



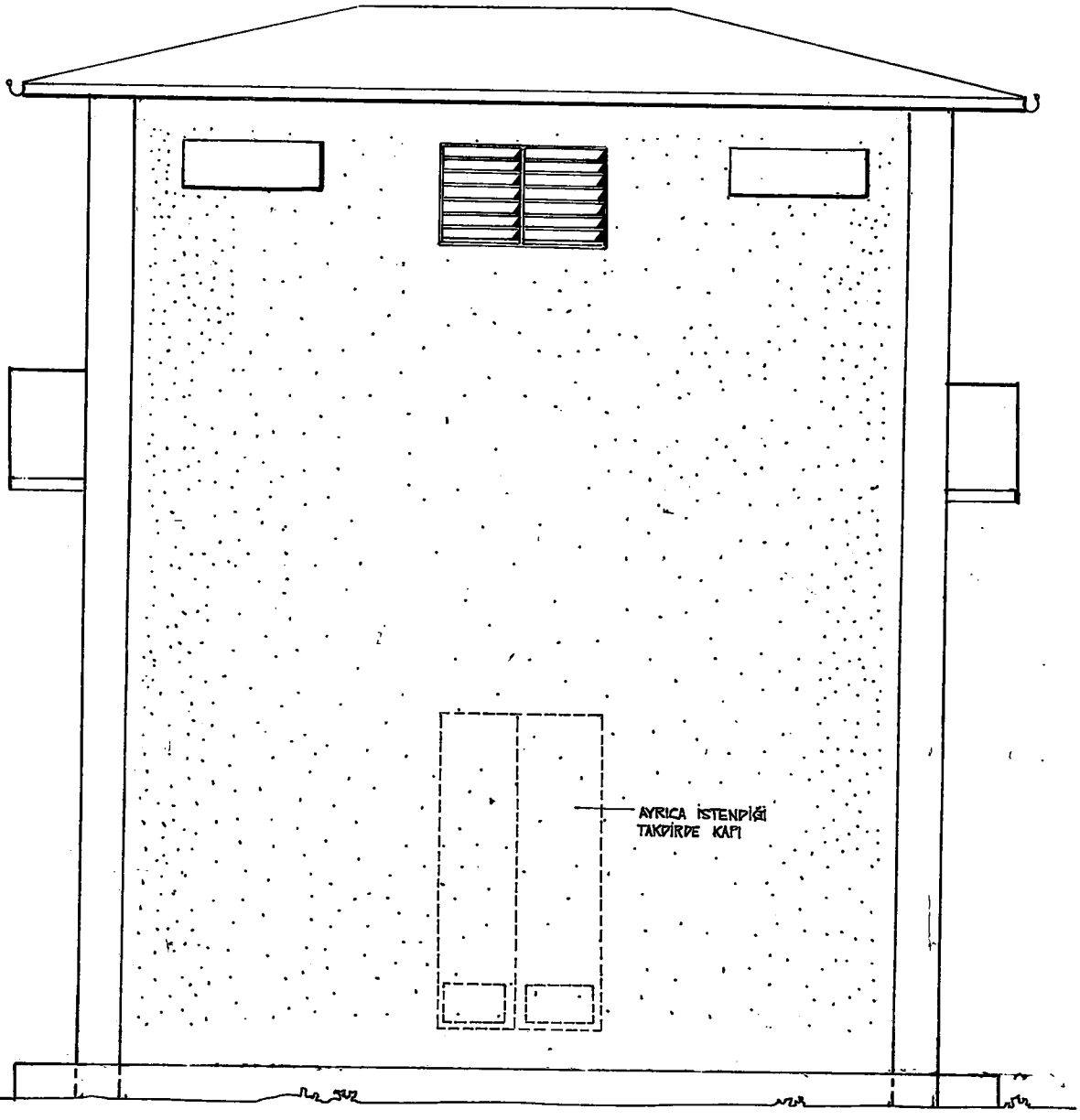
ÖN GÖRÜNÜŞ



SAĞ YAN CEPHE



SOL YAN CEPHE



ARKA GÖRÜNÜŞ

ENERJİ ve TABİİ KAYNAKLAR BAKANLIĞI

İLLER BANKASI

4H.K
5

73
56

DEĞİŞİKLİK	TARİH	İMZA
a)	16.7.1975	
b)		

30-34.5 KV 4 HÜCRELİ
15 KV. 6 HÜCRELİ KULE ÇIKIŞLI TİP
TRANSFORMATÖR BİNASI
BETONARME RESİMLERİ

ÖLÇEK 1/50

NO.LU PLÂN İPTAL EDİLDİ

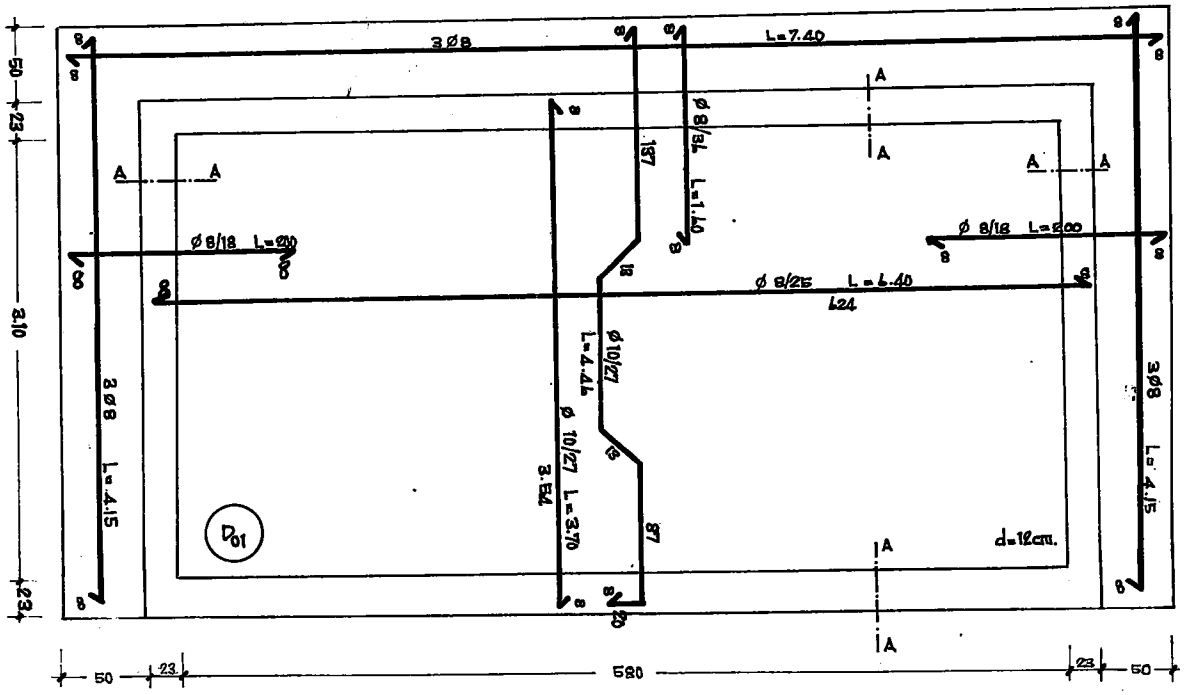
NO.LU PLÂN İPTAL EDİLDİ

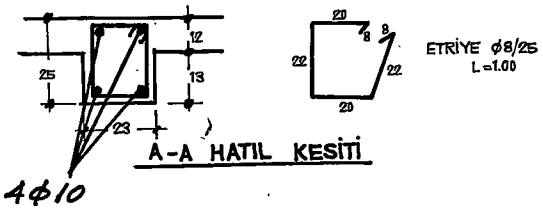
PROJEYİ YAPANIN, DİPL NO. ÜNVANI, ADI, SOYADI	İMZA	İMZA TARİHİ
YÜK. İNŞ. MÜH. ÇETİN PEKİNER ODA NO: 8730 - DİP. NO: 7463 TELEFON: 174701		
ÇİZEN:		

İLLER BANKASI
ENERJİ DAİRESİ
REİSLİĞİ

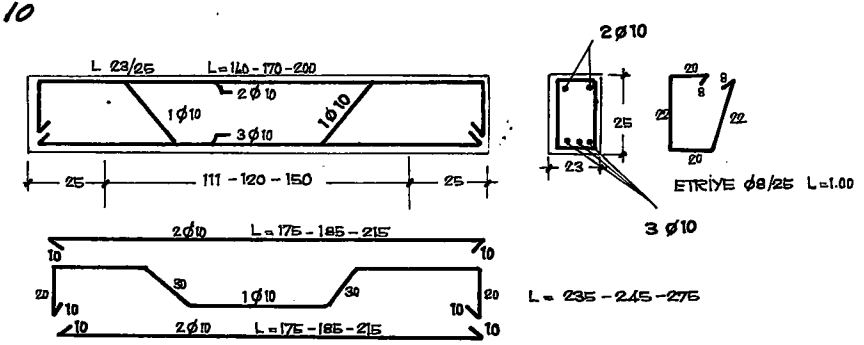
PLÂN NO
116-1./44

ARŞİV KAYIT NO

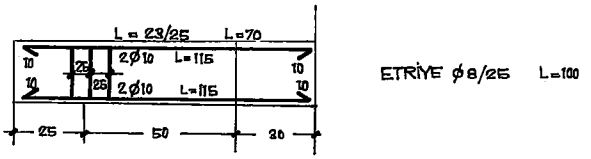




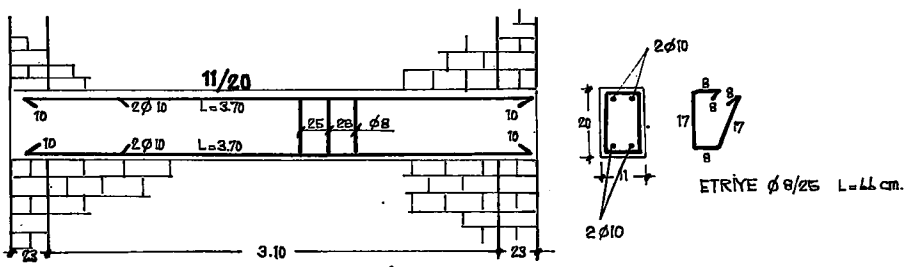
A-A HATIL KESİTİ



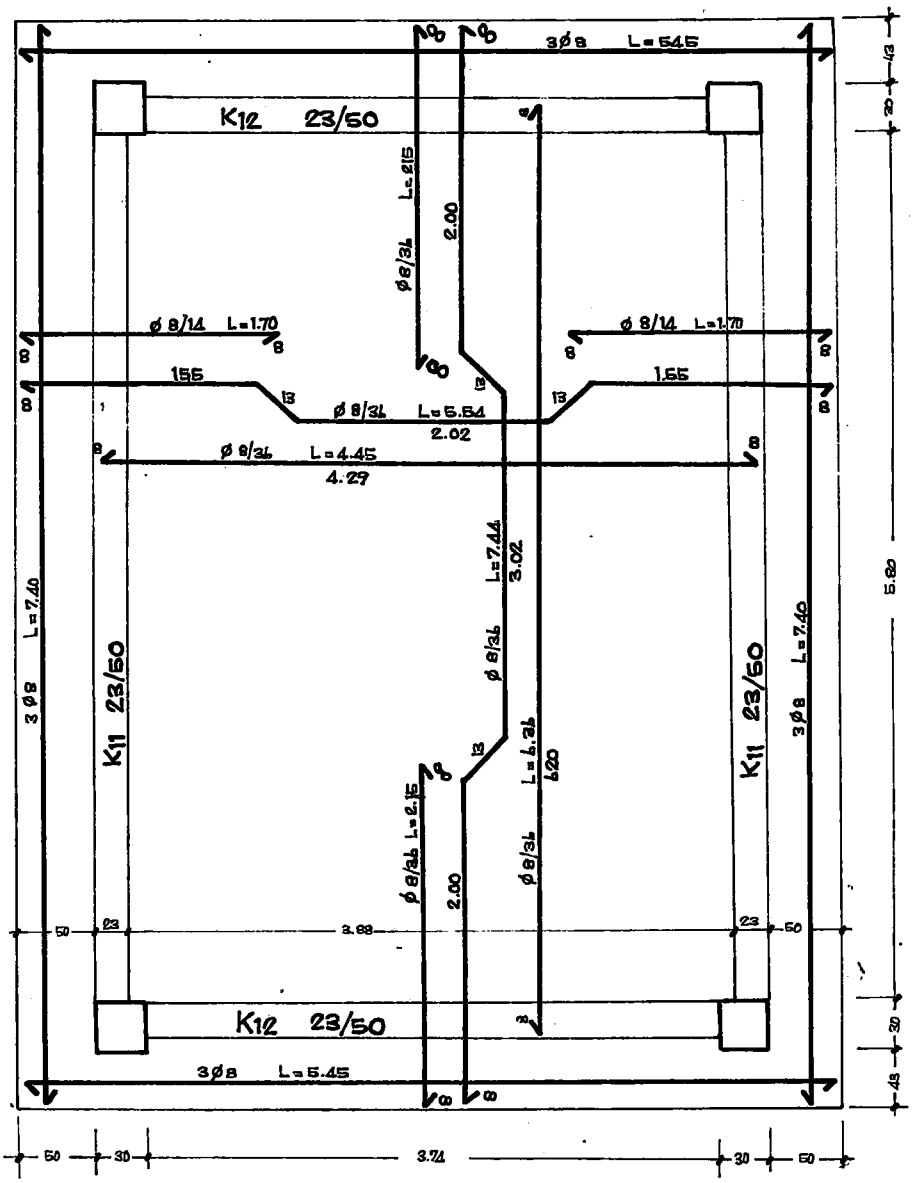
111/220 - 120/235 - 150/220 KAPI LENTOLARI

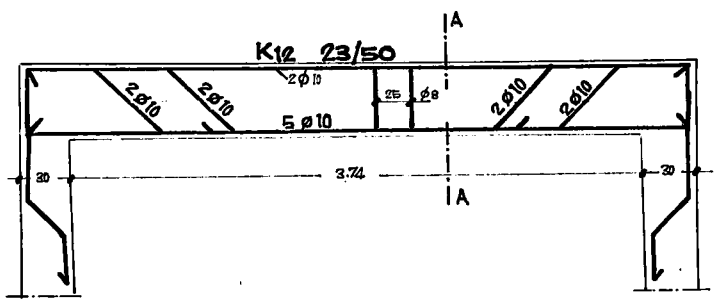


50/70 PENCERE LENTOSU

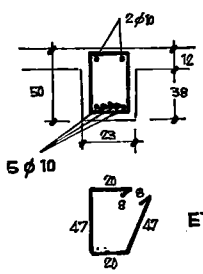


TRAFO ARA BÖLMESİ
YARIM TUĞLA DUVAR ARA HATILI

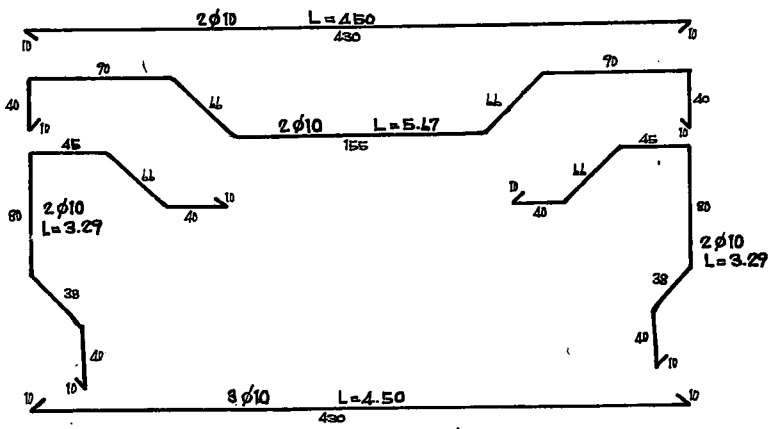


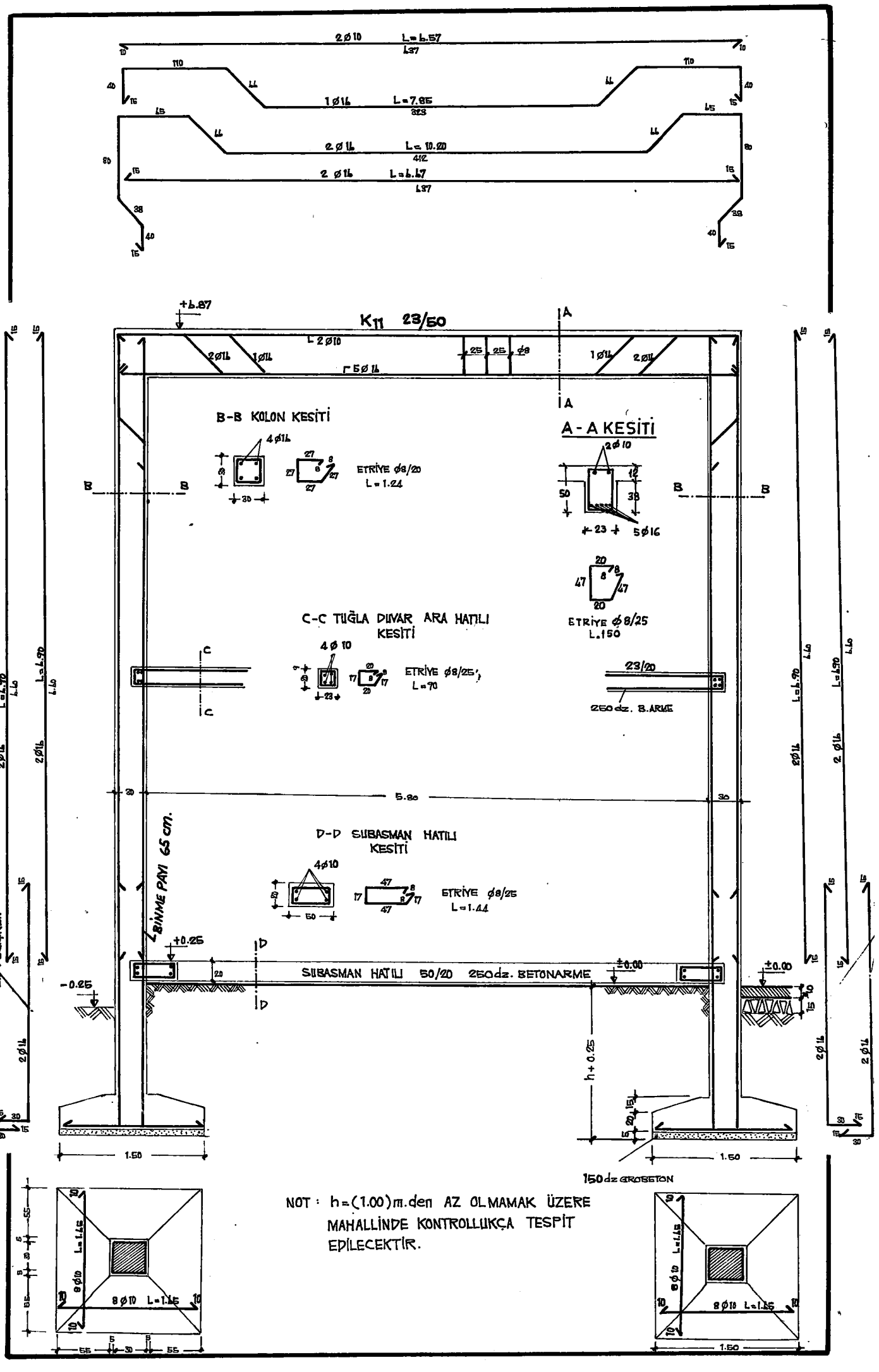


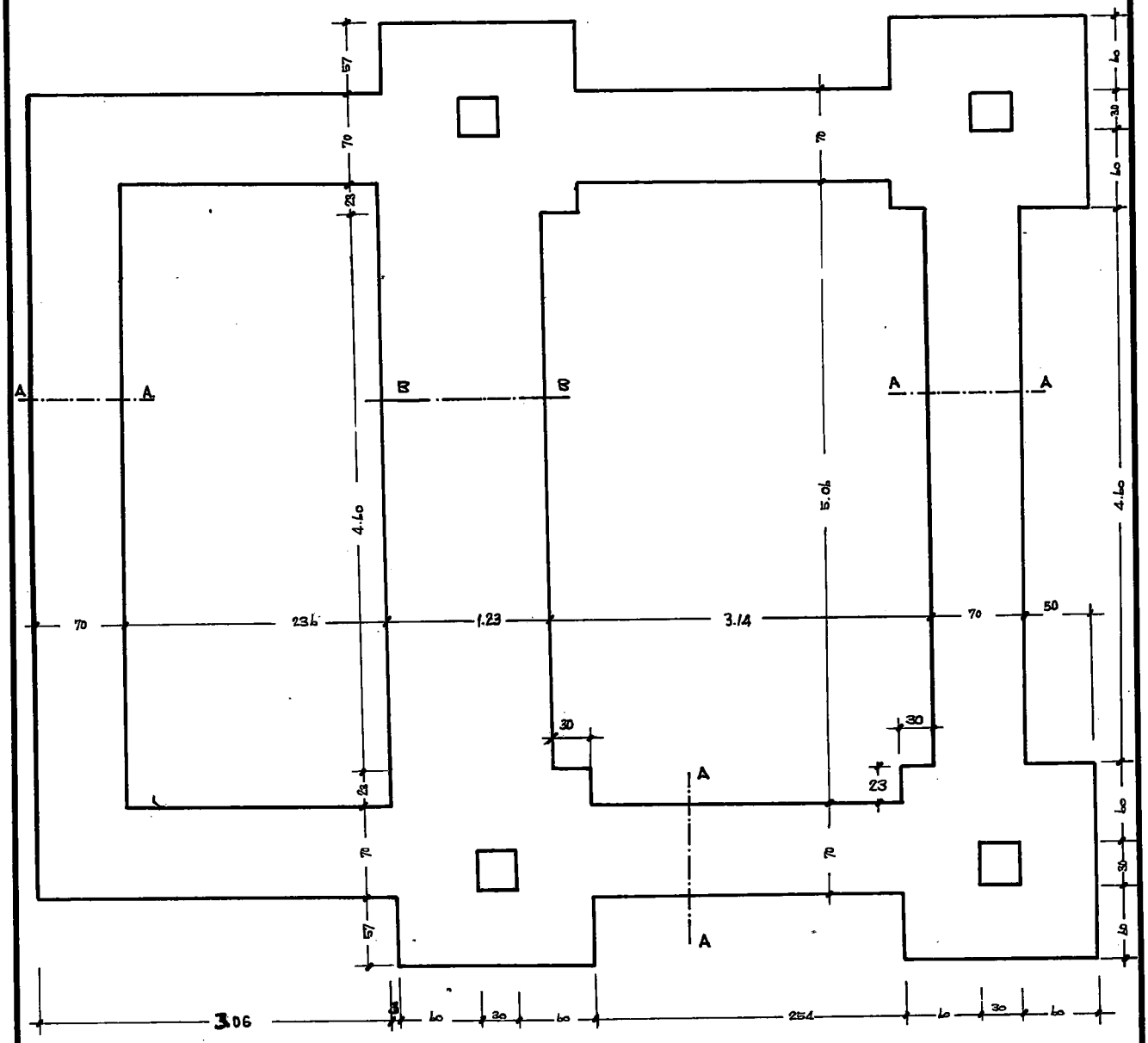
A-A KESİTİ



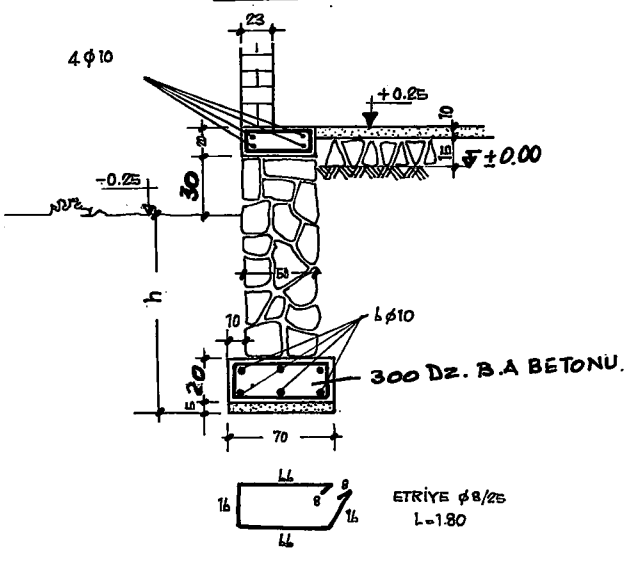
ETRİYE ø8/25
L=1.50



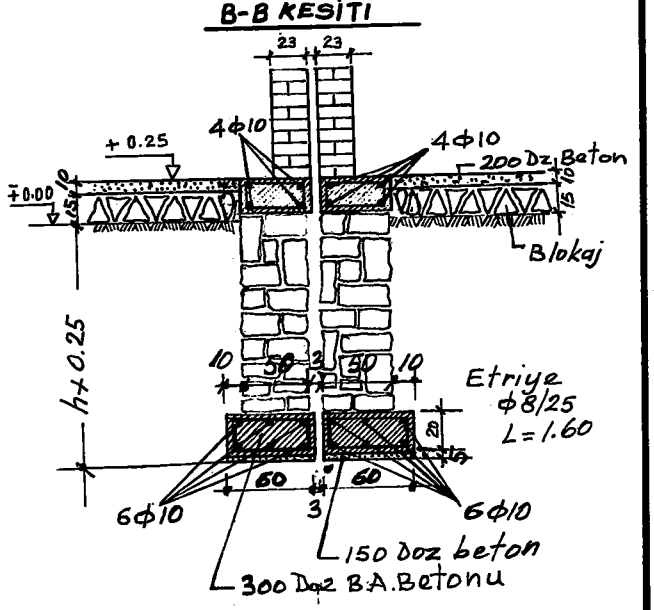

2Ø10 L=6.57
1Ø14 L=7.85
2Ø14 L=10.20
2 Ø14 L=6.47
K11 23/50
L 2Ø10
2Ø14
1Ø14
5Ø14
B-B KOLON KESİTİ
4Ø14
ETRİYE Ø8/20
L=1.24
A-A KESİTİ
2Ø10
5Ø16
ETRİYE Ø8/25
L.150
C-C TUĞLA DUVAR ARA HATILI KESİTİ
4Ø10
ETRİYE Ø8/25
L=70
23/20
250dz. B.ARME
D-D SUBASMAN HATILI KESİTİ
4Ø10
ETRİYE Ø8/25
L=1.44
BİNME PAYI 65 cm.
SUBASMAN HATILI 50/20 250dz. BETONARME
+0.25
±0.00
-0.25
h+0.25
1.50
150dz GROBETON
L DEĞİŞKEN
8Ø10 L=1.15
NOT : h=(1.00)m.den AZ OLMAMAK ÜZERE MAHALLİNDE KONTROLLUKÇA TESPİT EDİLECEKTİR.



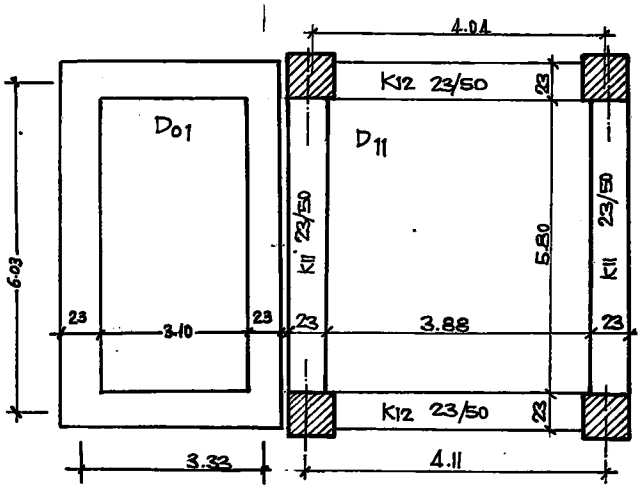
A-A KESİTİ



B-B KESİTİ



(34,5KV – 4 HÜCRELİ) 15 KV – 6 HÜÇRELİ KULELİ
TRANSFORMATÖR BİNASI BETONARME HESAPLARI



StI B 160

Yük: Döşeme zatı = 0.12 x 2.4 = 0.288 t/m²

Sıva = 0.057 t/m²

Çatı = 0.100 t/m²

Kar. = 0.075 t/m²

P = q = 0.520 t/m²

D01 DÖŞEMESİ : $\varepsilon = \frac{6.03}{3.33} = 1.81$ tek doğrultu.

$M = \frac{0.520 \times 3.33^2}{8} = 0.72$ tm. h = 10cm. Cb = 48 kg/cm² fe = 5.80 cm²

donatı ϕ 10/13⁵ (1düz 1plye)

„diğer doğrultu tevzi ϕ8/25

D11 DÖŞEMESİ :

$\varepsilon = \frac{6.03}{4.11} = 1.46$

$\alpha_4 = 0.03050$
$\beta_4 = 0.00471$
$H_4 = 0.8196$
$\varphi_4 = 0.1804$

Max Mx = $0.03050 \times 0.520 \times 4.11^2 = 0.268$ tm.

Max My = $0.00471 \times 0.520 \times 6.03^2 = 0.127$ tm.

X = $-\frac{1}{12}\ 0.8196 \times 0.520 \times 4.11^2 = 0.600$ tm.

Y = $-\frac{1}{12}\ 0.1804 \times 0.520 \times 6.03^2 = 0.290$ tm.

X doğrultusu Mx = 26.8 tcm. h = 10 cm. Cb = 24 kg/cm² fe = 2.08cm² donatı ϕ8/18 (1düz 1plye)

Y „ My = 12.7 „ h = 7.5cm. Cb = 18 kg/cm² fe = 1.12 cm² donatı ϕ8/18 (1düz 1plye)

X Mesneti x = 60.0 tcm. h = 10 cm. Cb = 42 kg/cm² fe = 4.8 cm² mevcut ϕ8/36

ilave ϕ8/14

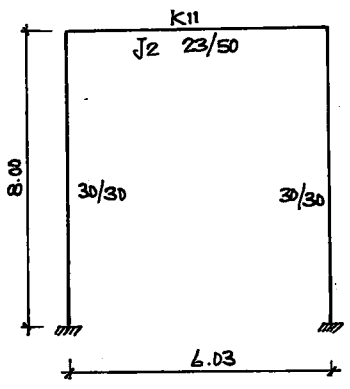
Y Mesneti Y = 29.0 tcm. h = 10cm. Cb = 28 kg/cm² fe = 23cm² mevcut ϕ8/36

ilave ϕ8/36

73/56

ÇERÇEVE HESABI:

Sistem her iki istikamette çerçeve olarak hesaplanacak



Kiriş atalet momenti $b = 2.25d + b_1 = 2.25 \times 12 + 23 = 50\,cm^2$

$\frac{b_0}{b} = \frac{23}{50} = 0.46$

$\frac{d}{d_1} = \frac{12}{50} = 0.24$

$\Rightarrow M = 18.7$

$J_2 = \frac{50 \times 50^3}{18.7} = 33.42\ dm^4$

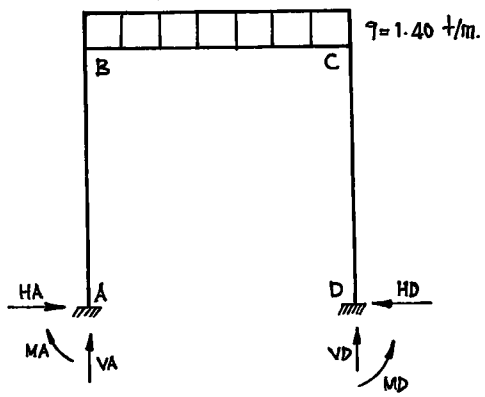
$J_1 = \frac{3 \cdot 0^4}{12} = 6.75\ dm^4$

$K = \frac{J_2}{J_1} \cdot \frac{h}{1} = \frac{33.42}{6.75} \cdot \frac{8.00}{6.03} = 6.6$

$N1 = 6.6 + 2.0 = 8.6$

$N2 = 6 \times 6.6 + 1 = 40.6$

ZATİ YÜK:



Yük: döşemeden = $0.404 \times 0.520 \times 4.11 = 0.860$ t/m.

Sacaktan = $0.50 \times 0.520 = 0.260$ "

kiriş zati = $0.23 \times 0.50 \times 2.4 = 0.280$ "

1.40 t/m.

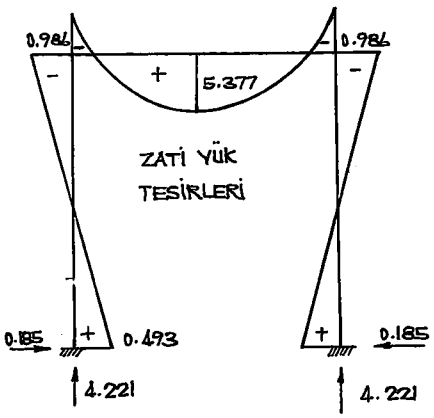
$MA = MD = \frac{1.40 \times 6.03^2}{12 \times 8.6} = 0.493$ tm.

$MB = MC = \frac{1.40 \times 6.03^2}{6.86} = 0.986$ tm.

$MaxM = \frac{1.40 \times 6.03^2}{8} - 0.986 = 5.377$ tm.

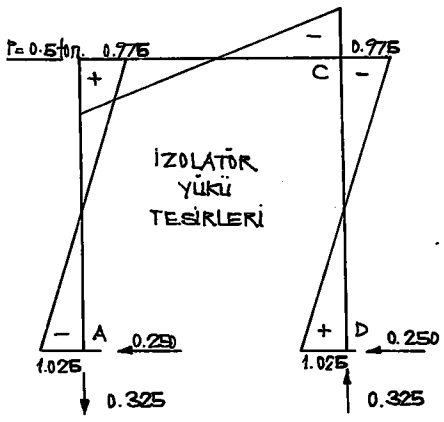
$VA = VD = \frac{1.40 \times 6.03}{2} = 4.221$ ton.

$HA = HD = \frac{3 \times 0.493}{8.00} = 0.185$ ton.



İZOLATÖR YÜKÜ :

P= 0.500 ton.



$$\begin{matrix} MA \\ MD \end{matrix} \Big\rangle = \mp \frac{0.500 \times 8.00}{2} \cdot \frac{1+3\times 6.6}{40.6} = \begin{matrix} -1.025 \\ +1.025 \end{matrix}$$

$$\begin{matrix} MB \\ Mc \end{matrix} \Big\rangle = \pm \frac{0.500 \times 8.00}{2} \times \frac{3\times 6.6}{40.6} = \begin{matrix} +0.975 \\ -0.975 \end{matrix}$$

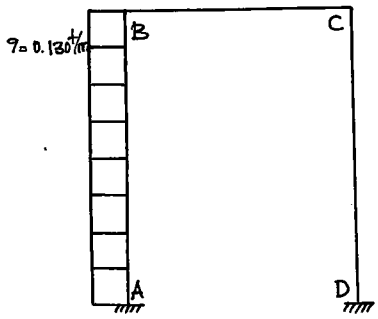
$$VA = VD = \frac{2 \times 0.975}{6.03} = 0.325$$

$$HA = HD = \frac{0.500}{2} = 0.250$$

TAM RÜZGÂR :

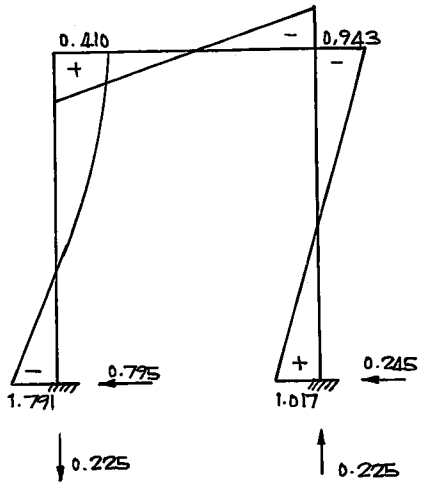
RÜZGÂR YÜKÜ : $W = 1.2 \times 50 = 60\ kg/m^2$

$$q = 60 \times \frac{4.34}{2} = 130\ kg/m.$$



$$\begin{matrix} MA \\ MD \end{matrix} \Big\rangle = \frac{0.130 \times 8.0^2}{4} \left(-\frac{3+6.6}{6\times 8.6} \mp \frac{1+4\times 6.6}{40.6} \right) = \begin{matrix} -1.791\ tm. \\ +1.017\ tm. \end{matrix}$$

$$\begin{matrix} MB \\ MC \end{matrix} \Big\rangle = \frac{0.130 \times 8.0^2}{4} \left(-\frac{6.6}{6\times 8.6} \pm \frac{2\times 6.6}{40.6} \right) = \begin{matrix} +0.410\ tm. \\ -0.943\ tm. \end{matrix}$$



$$VA = VD = \frac{0.130 \times 6.6 \times 8.0^2}{6.03 \times 40.6} = 0.225\ ton.$$

$$HD = \frac{0.130 \times 8.00\ (3+2\times 6.6)}{8\times 8.6} = 0.215\ ton.$$

$$HA = -\ (0.130 \times 8.00 - 0.215) = -\ 0.795\ ton.$$

K11- ÇERÇEVE KİRİŞİ HESABI:

$M_{max} = 537,7$ tcm. $\quad \varphi = \frac{d}{h} = \frac{12}{47} = 0.26 \quad i_3 = 0.797 \quad i_4 = 137$

$\sigma_b/\sigma_e = 50/1400$

$b = \frac{137 \times 537.7}{47^2} = 33.3$ cm. $< b_{max} = 4.5 \times 12 + 23 = 77$ cm.

$fe = \frac{0.797 \times 537.7}{47} = 9.12 cm^2$ Donatı üstte $2\phi 10$

Altta $5\phi 16$ (3 pilye) $(10.05\ cm^2)$

MESNET TAHKİKİ : $X_{max} = -98.6 - 97,5 - 94.3 = -290.4$ tcm.

$K_2 = 47\sqrt{\frac{23}{290,4}} = 13.3 \longrightarrow \sigma_b = 41\ kg/cm^2 \quad K_3 = 0.795$

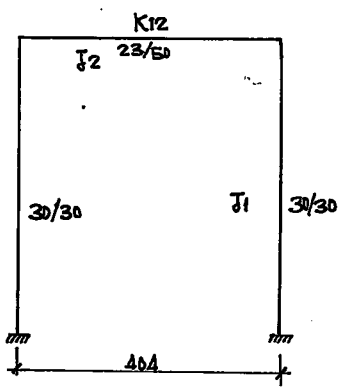
$fe = \frac{0.795 \times 290.4}{47} = 4.91 cm^2$ Donatı mevcut $2\phi 10 + 3\phi 16\ (7.60\ cm^2)$ kafi ilave istemez

KAYMA TAHKİKİ : $Q = 4.771$ ton. $\quad z = 0.898 \times 47 \cong 42$

$\tau_o = \frac{4.771}{23 \times 42} = 4.94\ kg/cm^2 < \tau_{o\,em} = 6\ kg/cm^2$

etr. $\phi 8/25$

K12 ÇERÇEVESİ :



KİRİŞ ATALET MOMENTİ :

$b = 2.25 \times 12 + 23 = 50$ cm.

$\frac{b_o}{b} = \frac{23}{50} = 0.46$

$\frac{d}{d_o} = \frac{12}{50} = 0.24$ $\quad M = 18.7$

$J_2 = \frac{5 \times 5^3}{18.7} = 33,42$

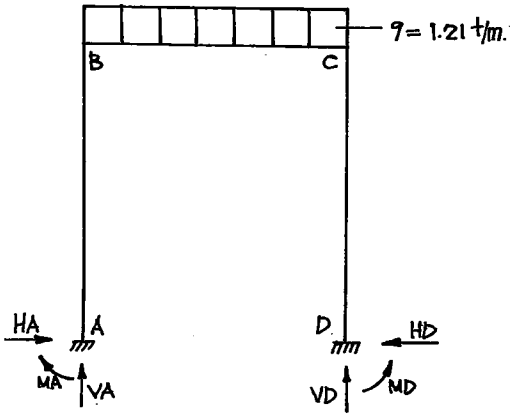
$J_1 = \frac{3^4}{12} = 6.75$

$K = \frac{33.42}{6.75} \times \frac{8.00}{4.04} = 9.8$

$N_1 = 9.8 + 2.0 = 11.8$

$N_2 = 4 \times 9.8 + 1.0 = 57.8$

ZATİ YÜK :

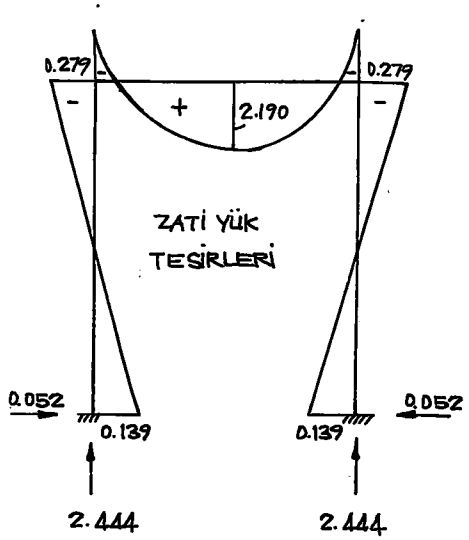


Yük : döşemeden = 0.313 x 0.520 x 4.11 = 0.67 t/m.
Saçak = 0.50 x 0.520 = 0.26 "
Kiriş zati = 0.23 x 0.50 x 2.4 = 0.28 "
1.21 t/m.

$$MA = MD = \frac{1.21 \times 4.04^{-2}}{12 \times 11.8} = 0.139 \text{ tm.}$$

$$MB = MC = \frac{1.21 \times 4.04^{2}}{4 \times 11.8} = 0.279 \text{ tm.}$$

$$M_{max}\ M = \frac{1.21 \times 4.04^{2}}{8} - 0.279 = 2.190 \text{ tm.}$$

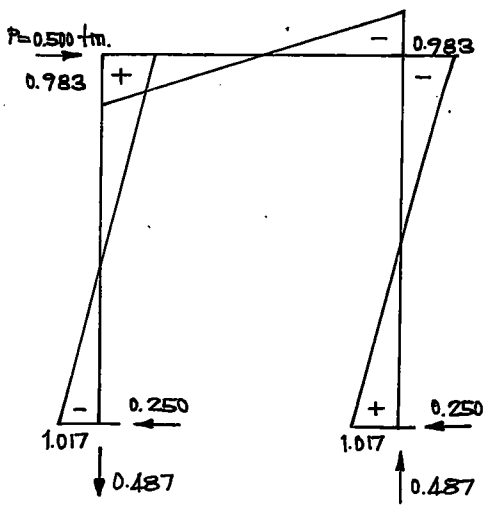


$$VA = VD = \frac{1.21 \times 4.04}{2} = 2.444 \text{ ton.}$$

$$HA = HD = \frac{3 \times 0.139}{8.00} = 0.052 \text{ ton.}$$

İZOLATÖR YÜKÜ :

P = 0.500 ton.



$$MA \atop MD \Big\} \mp \frac{0.5 \times 8.00}{2} \times \frac{1+3\times 9.8}{59.8} = \begin{cases} -1.017 \\ +1.017 \end{cases}$$

$$MB \atop MC \Big\} \pm \frac{0.5 \times 8.00}{2} \times \frac{3 \times 9.8}{59.8} = \begin{cases} +0.983 \\ -0.983 \end{cases}$$

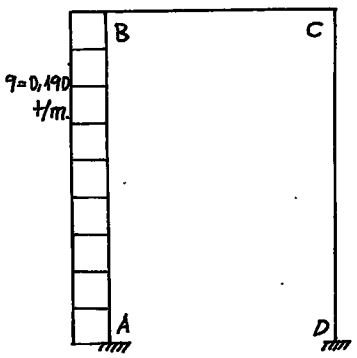
$$VA = VD = \frac{2 \times 0.983}{4.04} = 0.487$$

$$HA = HD = \frac{0.500}{2} = 0.250 \text{ ton.}$$

TAM RÜZGAR :

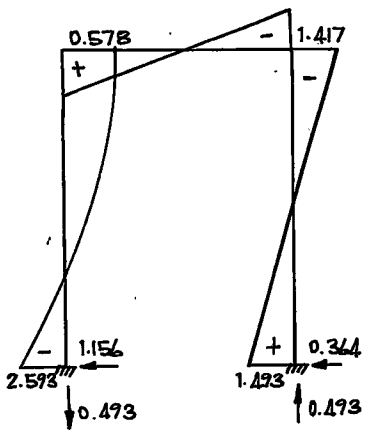
RÜZGÂR YÜKÜ : $W = 1.2 \times 50 = 60 \ kg/m^2$

$q = 60 \times \frac{6.26}{2} \simeq 0.190 \ t/m.$



$$MA \\ MD \Big\rangle \frac{0.190 \times 8.0^2}{4} \left(-\frac{3+9.8}{6 \times 11.8} \mp \frac{1+4 \times 9.8}{59.8} \right) = \begin{matrix} -2.593 \\ +1.493 \end{matrix}$$

$$MB \\ MC \Big\rangle \frac{0.190 \times 8.0^2}{4} \left(-\frac{9.8}{6 \times 11.8} \pm \frac{2 \times 9.8}{59.8} \right) = \begin{matrix} +0.578 \\ -1.417 \end{matrix}$$



$$VA = -VD = \frac{0.190 \times 9.8 \times 8.0^2}{4.04 \times 59.8} = 0.493$$

$$HD = \frac{0.190 \times 8.00 \ (3+2 \times 9.8)}{8 \times 11.8} = 0.364$$

$$HA = (0.190 \times 8.00 - 0.364) = 1.156$$

KIZ ÇERÇEVE KİRİSİ HESABI :

$M_{max} = 219 \ tcm.$ $\rho = \frac{d}{h} = \frac{12}{47} = 0.26 \rightarrow \frac{Cb}{Ce} = \frac{50}{1400}$ $i_3 = 0.797$ $i_6 = 137$

$b = \frac{137 \times 219}{47^2} = 13.6 \ < b_{max} = 4.5 \times 12 + 23 = 77 \ cm.$

$fe = \frac{0.797 \times 219}{47} = 3.71 \ cm^2$ donatı üstte $2 \phi 10$

Altta $5 \phi 10$ (2 Pilye); $3.93 cm^2$

MESNET TAHKİKİ : $X_{max} = -27.9 - 78.3 - 141.7 = -247.9 \ t/cm.$

$K_2 = 47 \sqrt{\frac{23}{247.9}} = 13.7 \rightarrow Cb = 40$ $k_3 = 0.794$

$fe = \frac{0.794 \times 247.9}{47} = 4.53 \ cm^2$

Mesnet $2 \phi 10 + 2 \phi 10 = 3,14$

ilave $2 \phi 10 \quad = 1.57$

$4.71 \ cm^2$

KAYMA TAHKİKİ :

Q = 3.424 Ton.

Z = 0,900 × 47 ≅ 42

$\tau_0 = \frac{3424}{23\times 42} = 3{,}55\ kg/cm^2 < \tau_{0em} = 6\ kg/cm^2$ etr: ϕ8/25

KOLON HESABI:

N zati = 4.221 + 2.444 = 6.665 ton

N izolatör = 0.325 + 0.487 = 0.812 "

N rüzgâr = 0.493 "

Kolon zati $(0.30^2 \times 8.00) \times 2.4 = 1.728$ "

9.698 ton

Mx zati = 0.493 tm. My = 0.189

M izolatör = 1.025 " My = 1.017

M rüzgâr = — " My = 1.493

Mmax = 1.518 tm. My max = 2,447 tm.

$\sigma_0 = \frac{9.698}{30\times 30} = 10.78\ kg/cm^2$ $\frac{\sigma_{bem}}{\sigma_0} = \frac{70}{10.78} = 6.49$

$\gamma = \frac{M_X}{N.d} + \frac{M_Y}{N.d}$ $\gamma = \frac{1.518}{9.698\times 0.3} + \frac{2.449}{9.698\times 0.3} = 1.43$ → $\mu = \mu_0 = 0.004$

$Fe = Fe' = 0.004 \times 30 \times 30 = 3.6\ cm^2$

$Fe + Fe' = 3{,}6 + 3{,}6 = 7{,}2\ cm^2$ donatı 4ϕ16 (8.04 cm²)

etr. ϕ8/20

FLANBAJ TAHKİKİ:

$\rho = \frac{800}{30} = 27$ → W = 1.48 $P_{em} = \frac{(K_b.F_b + \sigma_s.F_e)}{3W}$

Kb = 144

Fb = 30×30 = 900 cm²

σs = 2400

Fe = 8,04 cm²

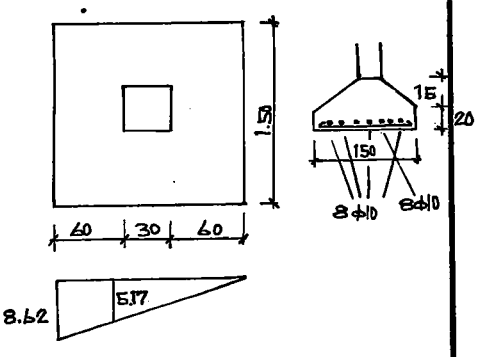
$P_{em} = \frac{144\times 900 + 2400\times 8.04}{3\times 1.48} = 33.535\ ton > N = 9.698\ ton.$

TEMEL HESABI:

$\sigma_{zem} = 15\ t/m^2$

$e = \frac{M}{N} = \frac{2.449}{9.698} = 0.27$

$\sigma_3 = \frac{9.698}{1.50\times 1.50}\left(1 \mp \frac{6\times 0.25}{1.50}\right) = \begin{cases} 8.62\ t/m^2 \\ 0.00 \end{cases}$



$\sigma_3' = (15 - 2\times 1.00) = 13\ t/m^2 > 8.62\ t/m^2$

$M = \frac{1}{2}\ 5.17 \times 0.60 \times \frac{0.60}{3} + \frac{1}{2} \times 8.62 \times 0.60 \times \frac{2}{3} \times 0.60 = 1.34\ tm.$

$K_2 = 25\sqrt{\frac{150}{134}} = 26,5$ $\quad$ $\bar{c}_b = 18$ $\quad$ $K_3 = 0.755$

$f_e = \frac{0.755 \times 134}{25} = 4.05\ cm^2$

Donati $8\phi\ 10$
Heriki istikamette

ENERJİ VE TABİİ KAYNAKLAR BAKANLIĞI	İLLER BANKASI ENERJİ DAİRESİ REİSLİĞİ
İLLER BANKASI BÖLGE MÜDÜRLÜĞÜ	YÜKLENİCİ

73
58

DEĞİŞİKLİK					
DEĞİŞİKLİK SEBEBİ					
DEĞİŞİKLİĞE AİT PROJEYİ YAPANIN	ADI VE SOYADI	ÜNVANI	ODA NO.	TARİH	İMZA
				/ /	

TRAFO BİNALARI KAPI, PENCERE PANCUR, KABLO KANALI, TEL KAFES KAPI V.S DETAY PLÂNLARI

ÖLÇEK:

NO.LU PLÂN İPTÂL EDİLDİ

NO.LU PLÂN İPTÂL EDİLDİ

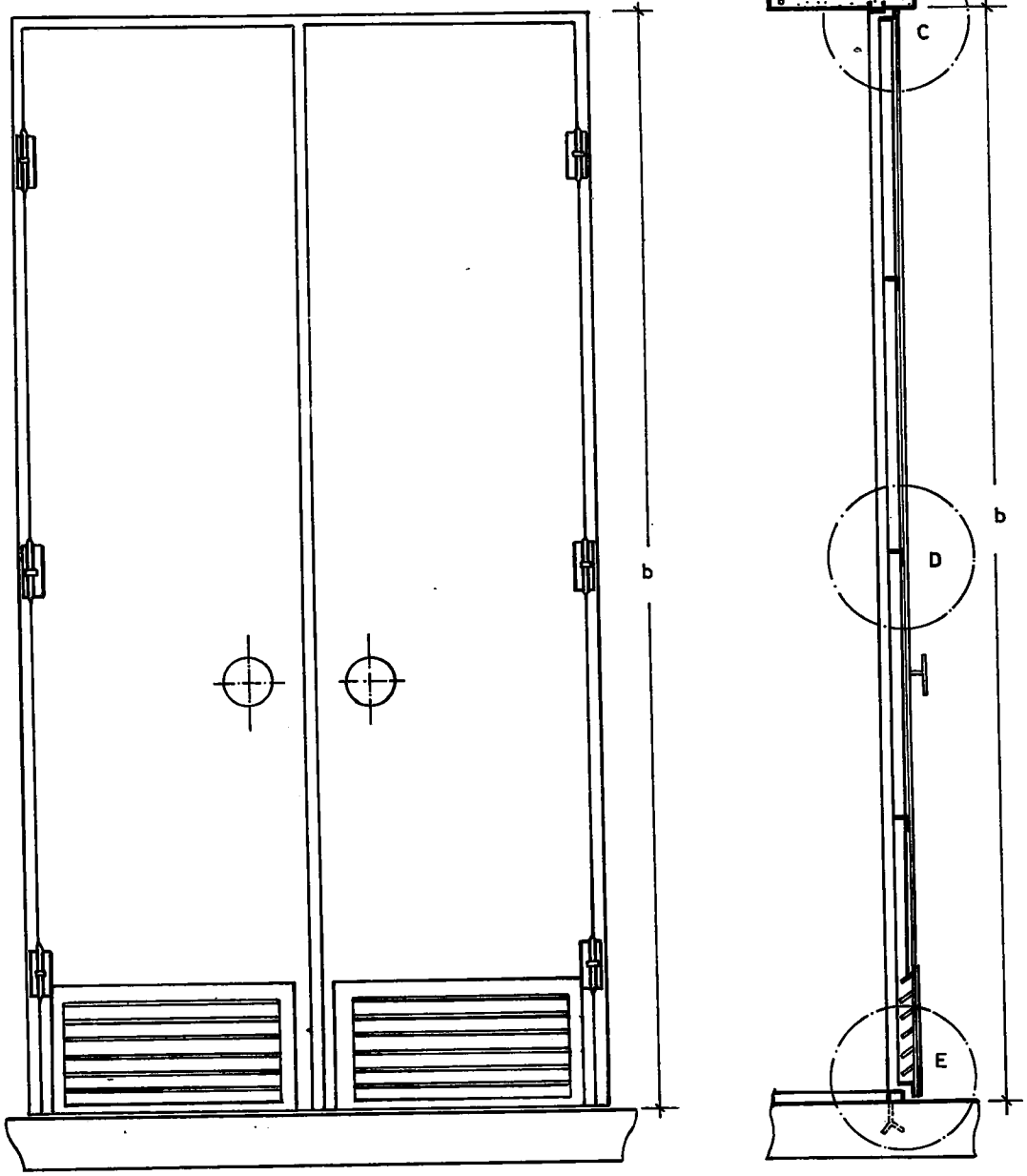
PROJEYİ YAPAN	İMZA	İMZA TARİHİ
YÜK.MÜH. HÜSEYİN BODUR ODA NO: 343		8_10_1973
ÇİZEN: İLKNUR ŞENİZ		

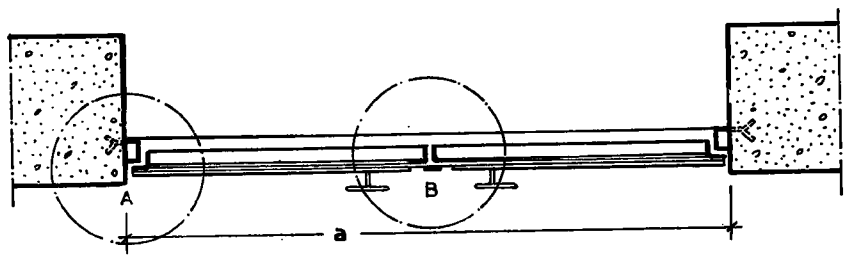
İLLER BANKASI ENERJİ DAİRESİ REİSLİĞİ

PLÂN NO: 1/60

ARŞİV KAYIT NO:

0.50 m.²

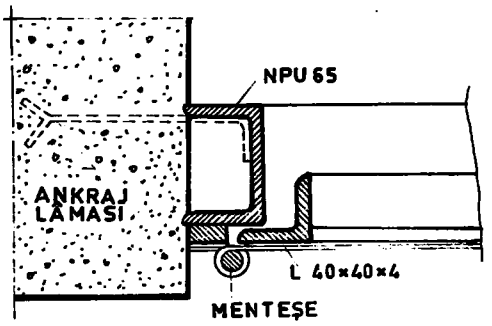




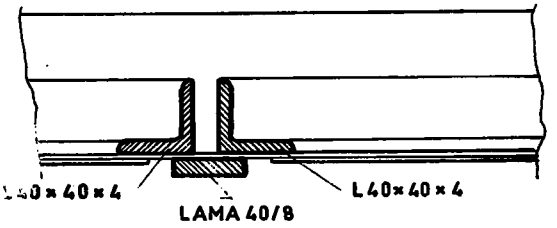
	(a) cm.	(b) cm
– ŞEBEKE TRAFO MERKEZLERİNDE VE TRAFO KAPISINDA	.....	.....
– SEBEKE TRAFOLARINDA VE GIRIS KAPISINDA	.....	.....
– TEVZİ MERKEZLERİNDE VE GİRİŞ KAPISINDA	.....	.....

TRAFO KAPI PLÂNI

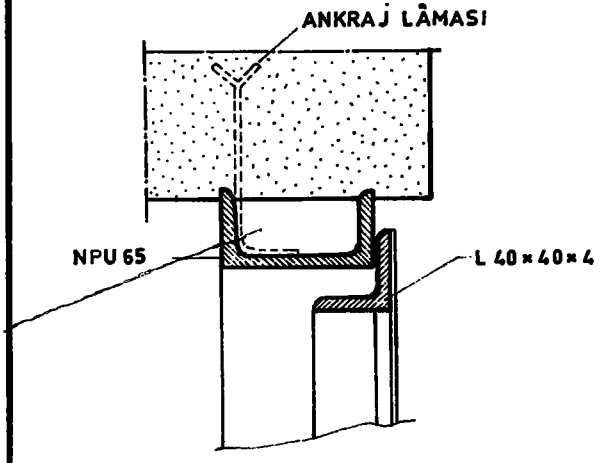
ÖLÇEK:1/15



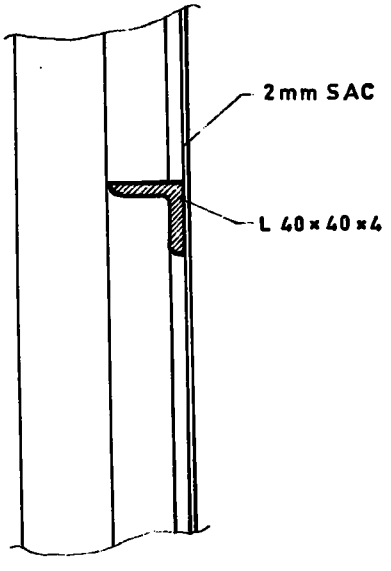
A DETAYI ÖLÇEK : 1/4



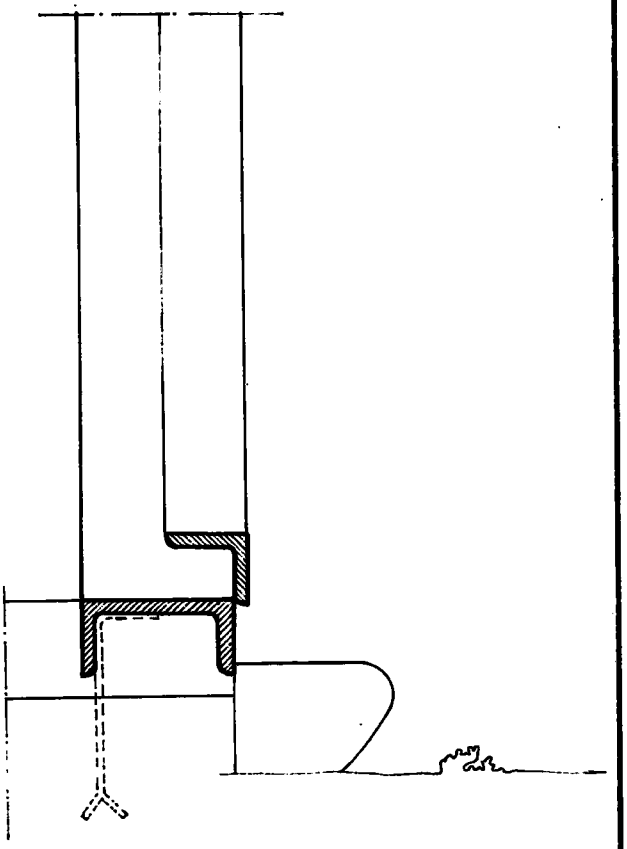
B DETAYI OLCEK: 1/4



C. DETAYI ÖLÇEK : 1/4

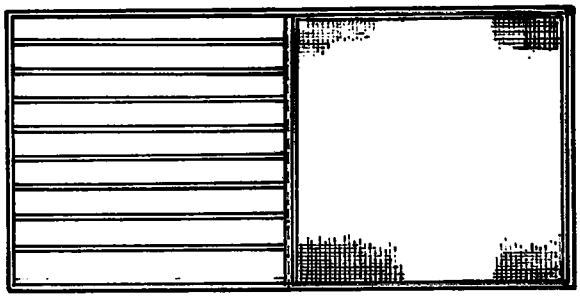


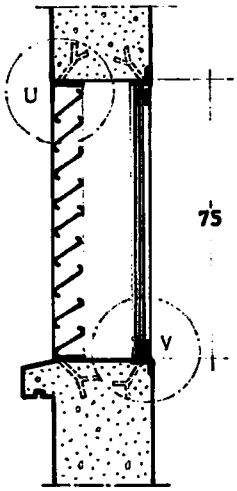
D DETAYI ÖLÇEK : 1/4

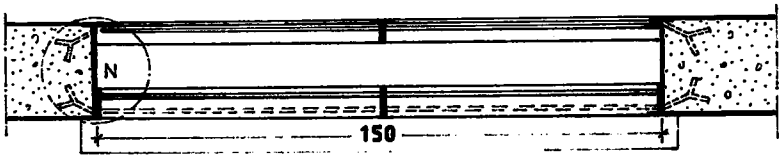


E DETAYI ÖLÇEK: 1/4

TRAFO KAPI DETAYLARI

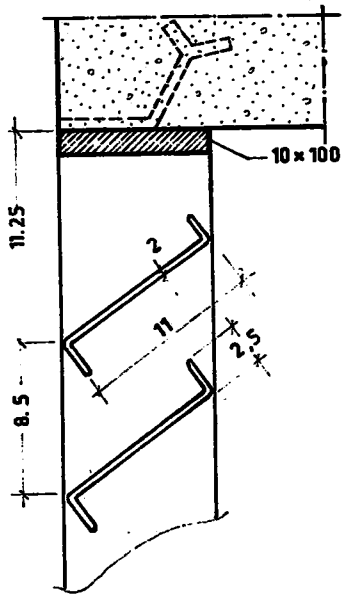




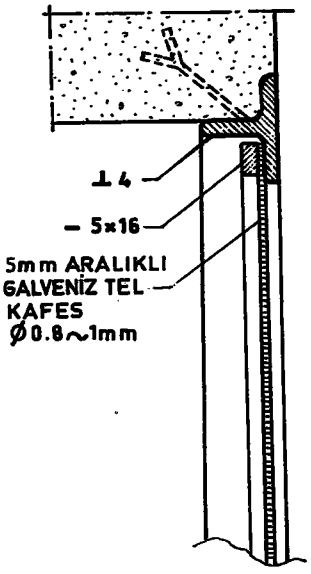


150 × 75 TRAFO PENCERE TİPİ ÖLÇEK: 1/20

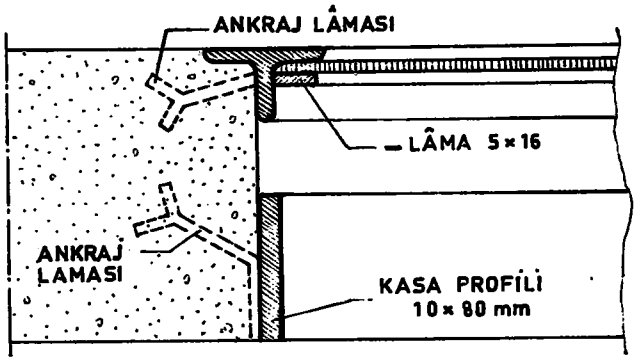
U DETAYI ÖLÇEK: 1/4



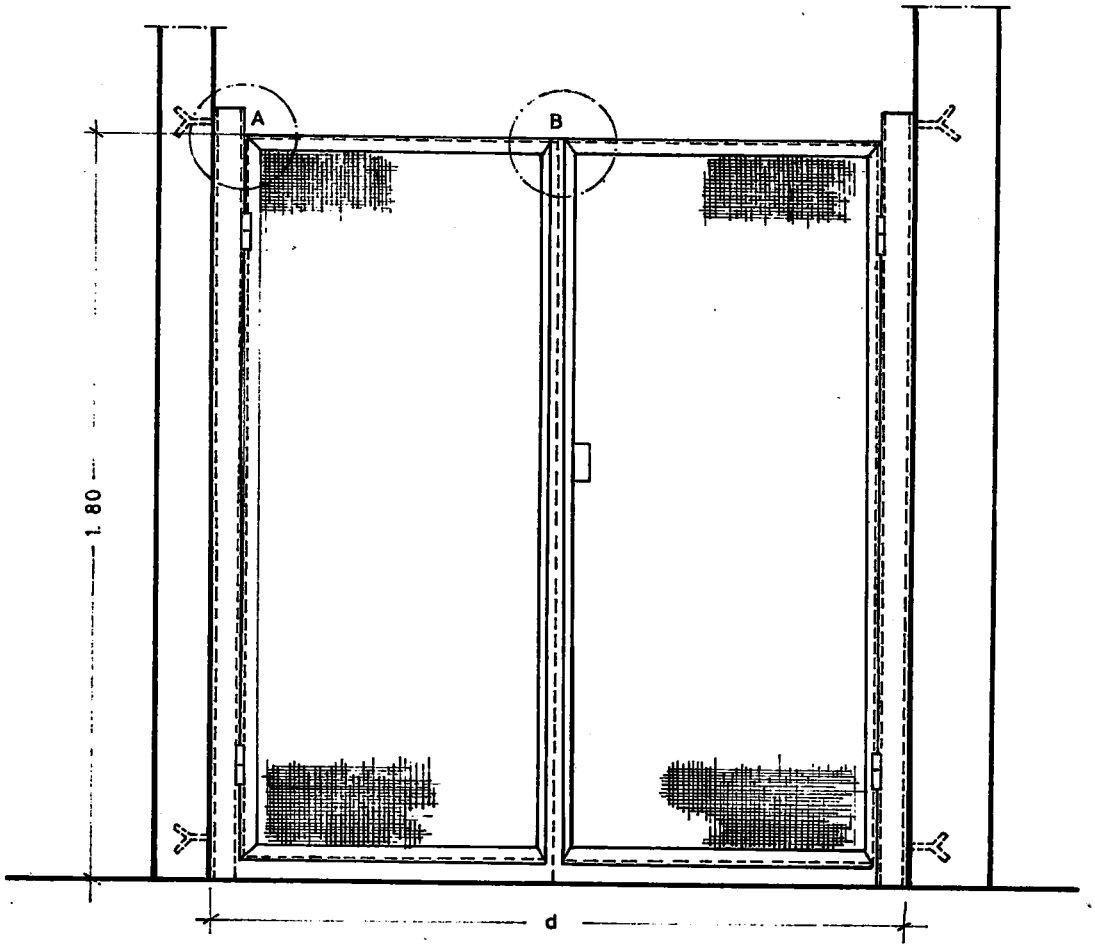
V DETAYI ÖLÇEK: 1/4

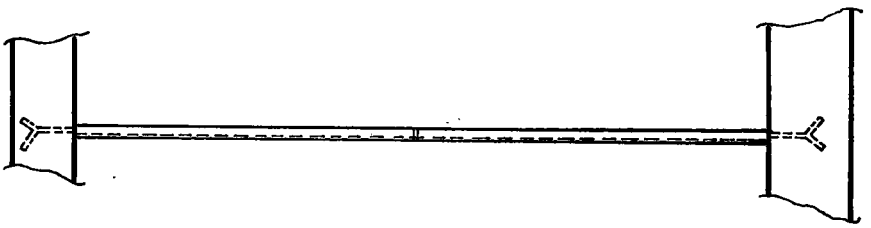


N DETAYI ÖLÇEK: 1/4

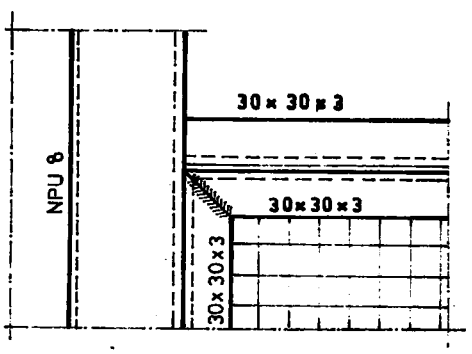


TRAFO PANCUR PLÂNI VE DETAYLARI

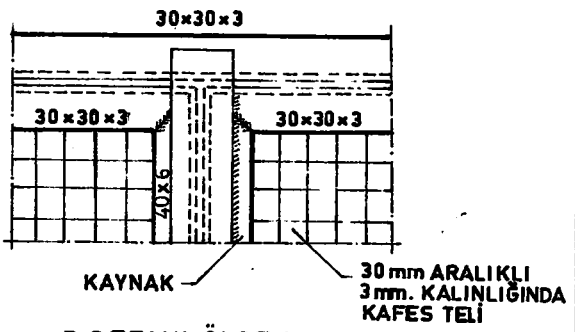




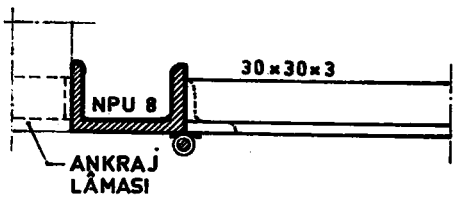
- SEBEKE TRAFOLARINDA VE 30 KV LUK HÜCRELERDE 180 İLA 187
- " " 15 KV LUK " 120 İLA 131
- ANA TRAFO MERKEZLERİ VE 30 KV LUK " ..... cm.
- " " " " 15 KV LUK " ..... cm.

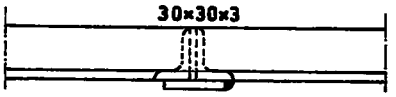


A DETAYI ÖLÇEK: 1/5

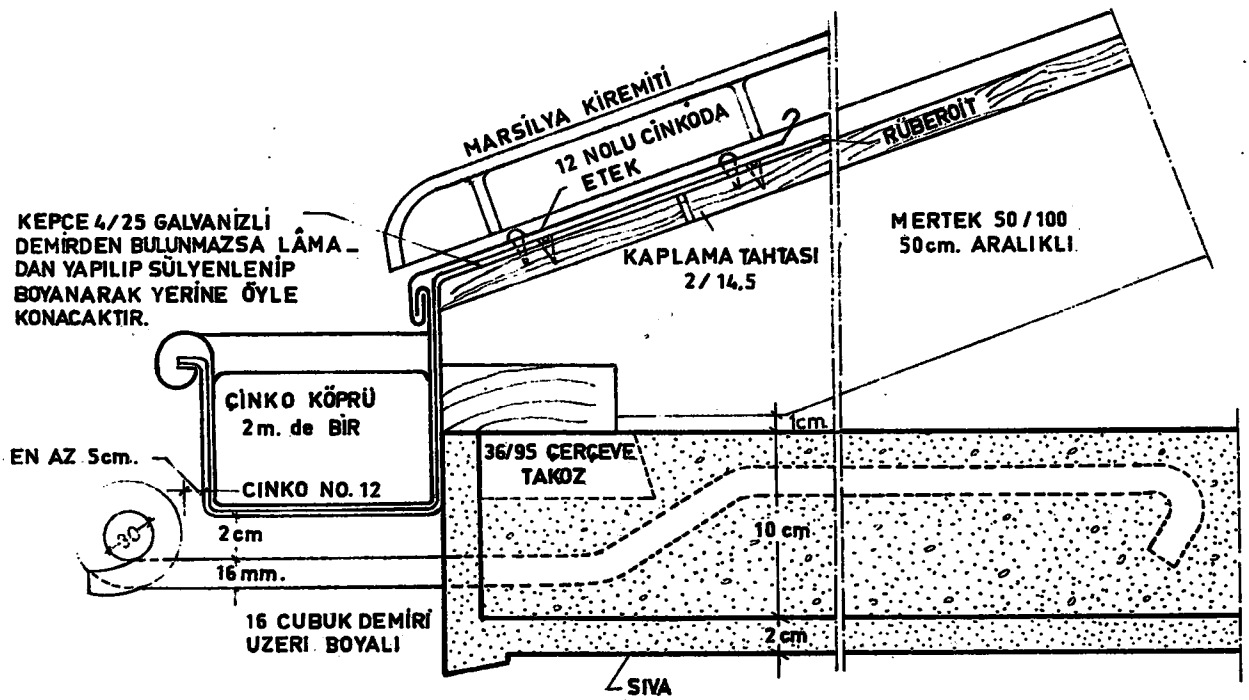


B DETAYI ÖLÇEK: 1/5

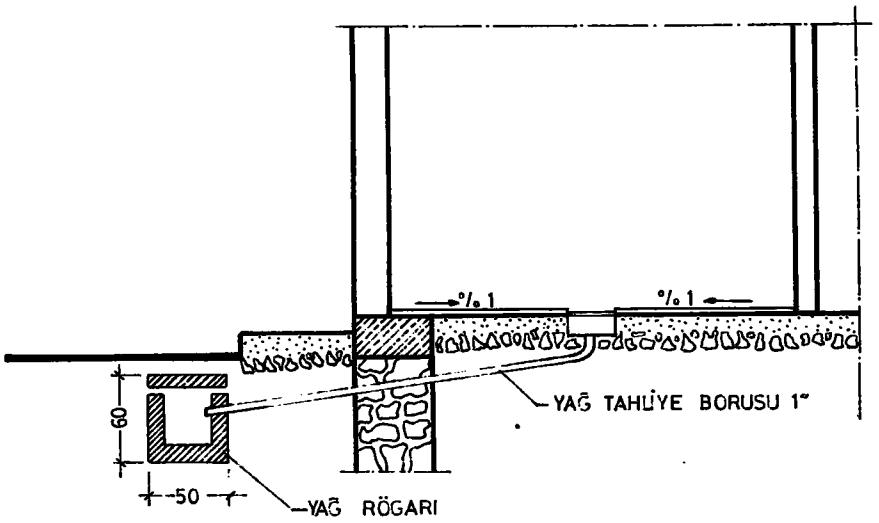


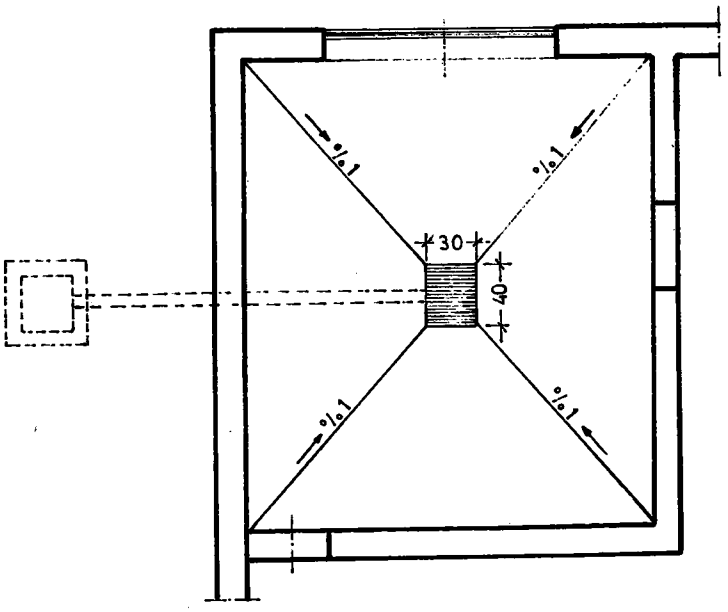


TEL KAFES KAPILAR VE DETAYLARI



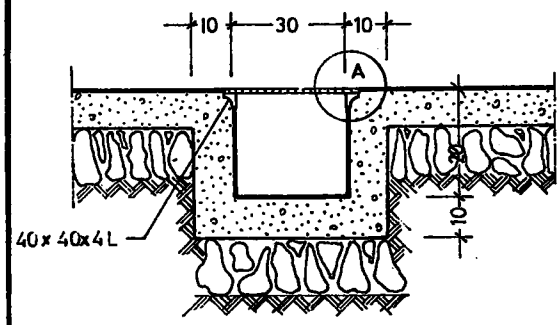
ÇATI DETAYI
ÖLÇEK: 1/4

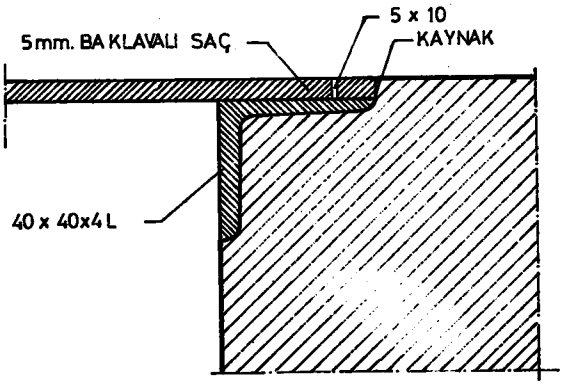




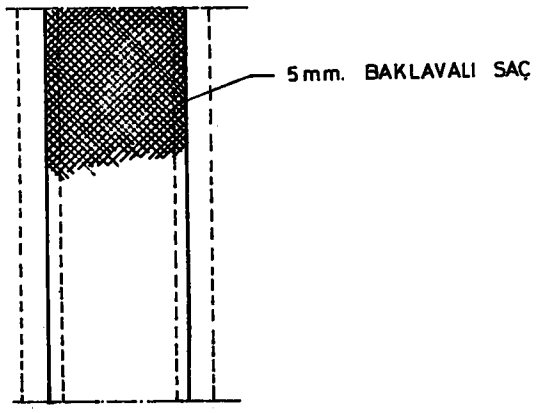
TRAFO YAĞ ÇUKURU DETAYI

ÖLÇEK:1/50



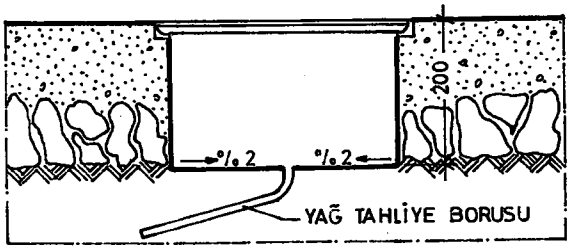


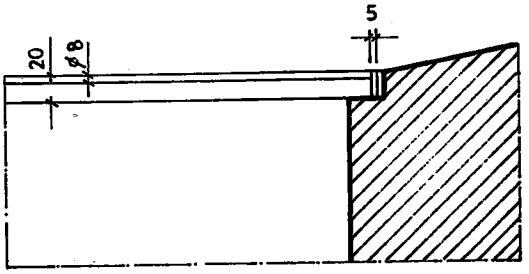
A DETAYI ÖLÇEK: 1/2,5

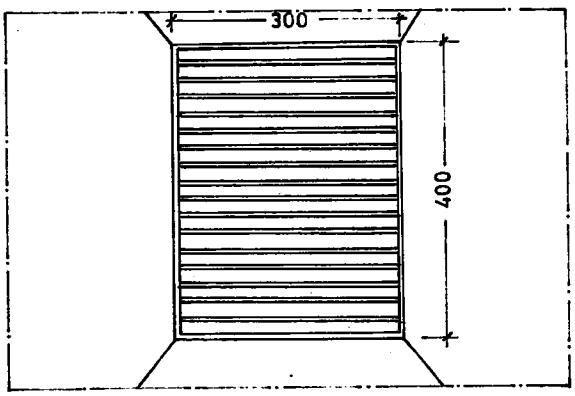


KABLO KANALI DETAYI

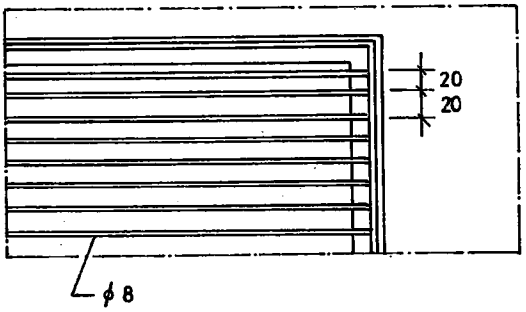
KABLO KANALI DETAYI







YAĞ ÇUKURU DETAYI ÖLÇEK: 1/10



IZGARA DETAYI ÖLÇEK: 1/5

YAĞ ÇUKURU DETAYI