



İBE — 120 : 1976

İLLER BANKASI
TİP PROJELERİ

KÜÇÜK TİP ANA TRANSFORMATÖR MERKEZİ 30 - 34,5 / 15 - 6,3 KV.

(SATIŞ İÇİN BASTIRILMIŞTIR)

İ Ç İ N D E K İ L E R

PLÂN NO:

MONTAJ PLÂNI	1/53
MİMARİ PROJESİ	1/54
BETONARME RESİMLERİ	1/55
BETONARME HESAPLARI	1/56
KAPI VS. DETAY PLÂNLARI	1/60

İLLER BANKASI
GENEL MÜDÜRLÜĞÜ MATBAASI

1 9 7 6

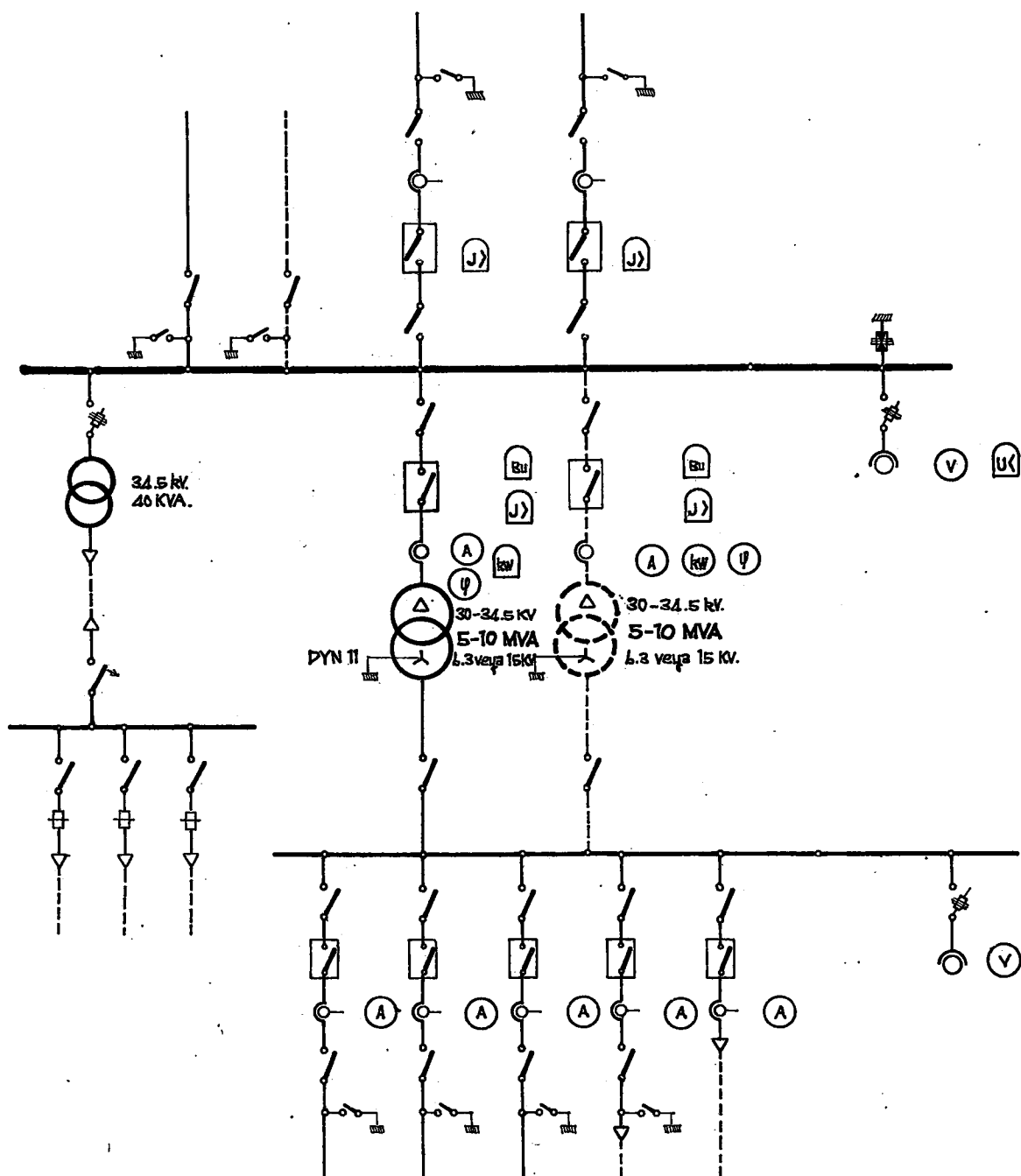
ENERJİ VE TABİİ KAYNAKLAR BAKANLIĞI:

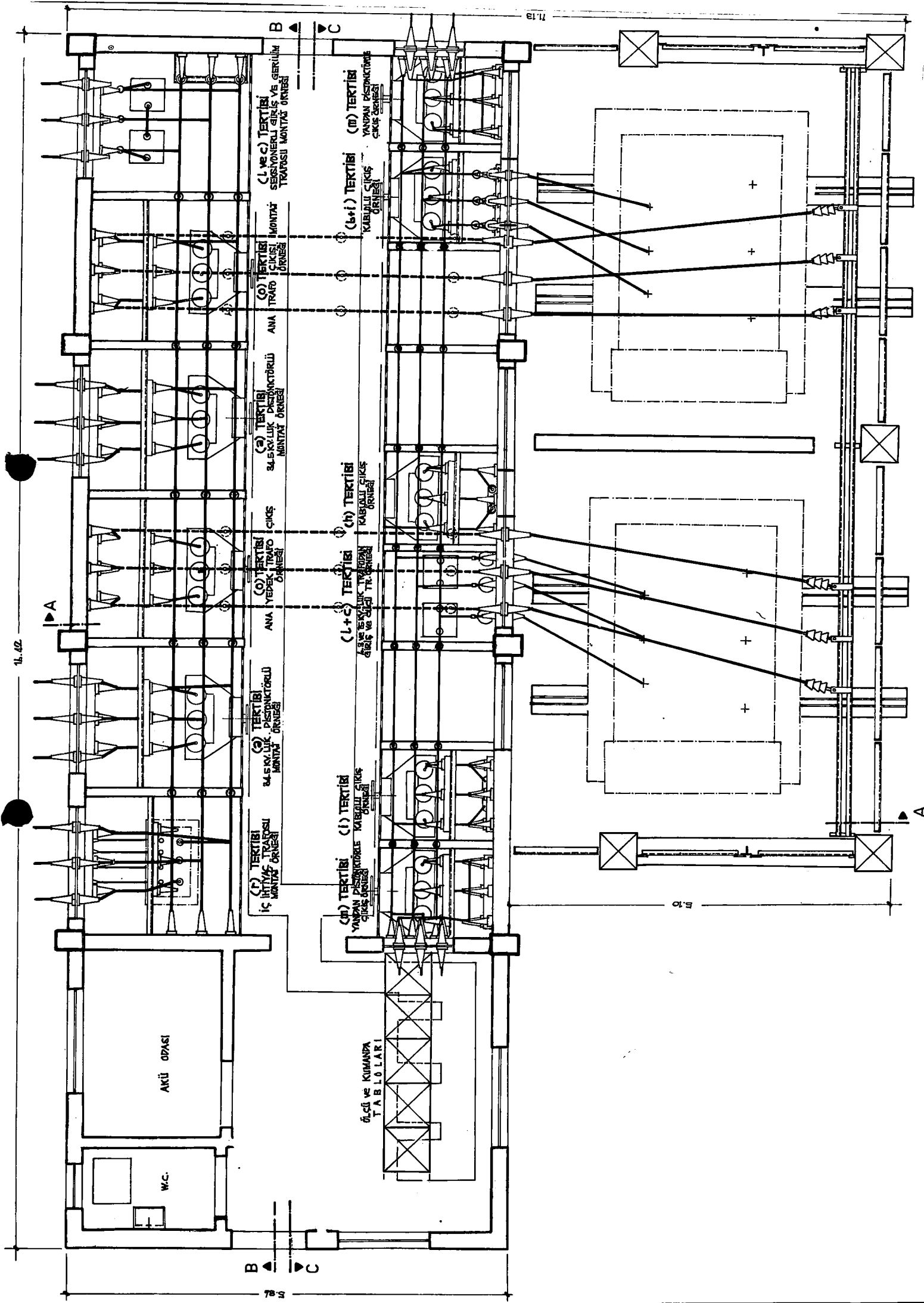
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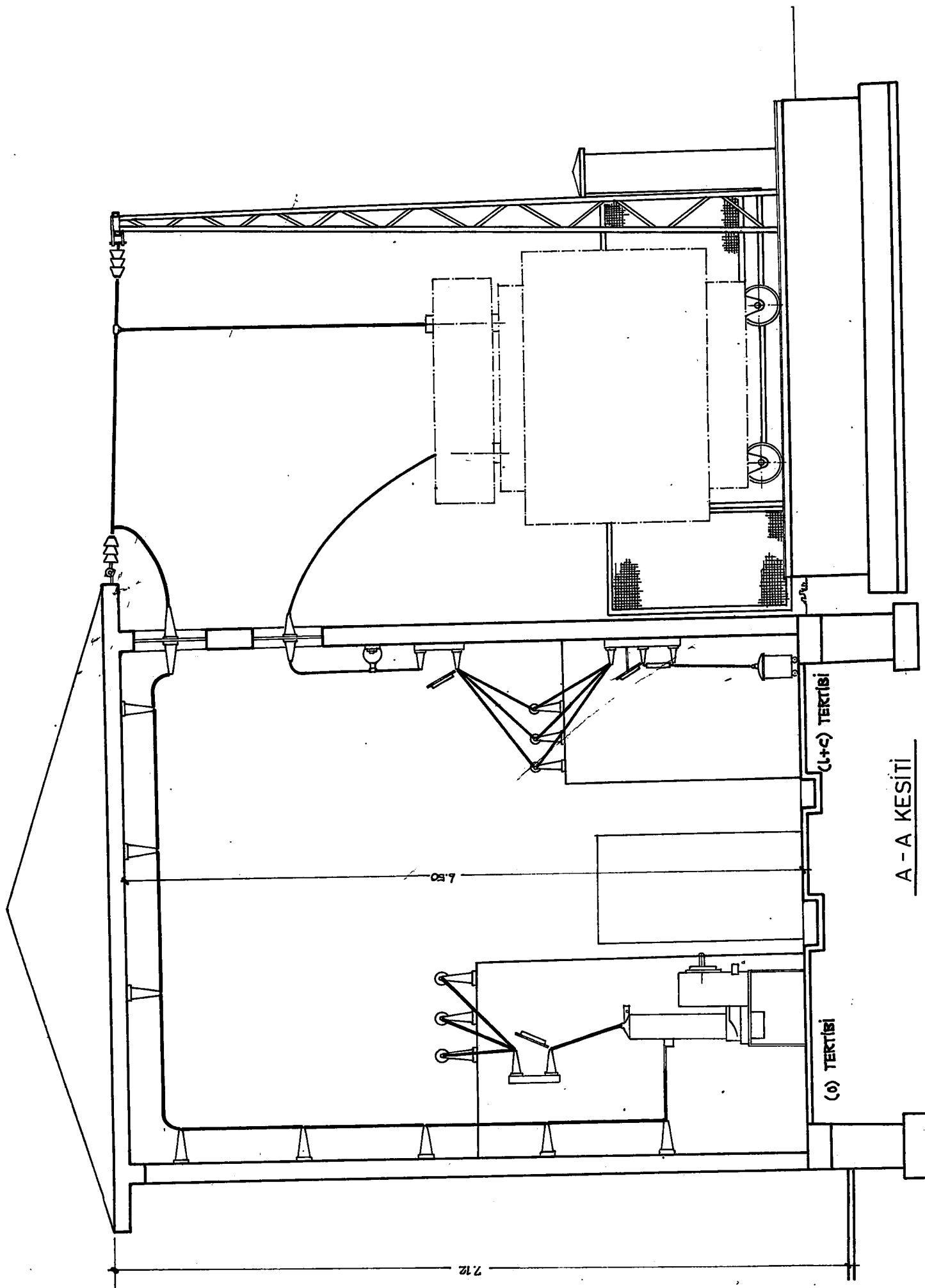
73
57

DEĞİŞİKLİK			TARİH	İMZA
a)				
b)				
KÜÇÜK TİP 30-34.5 KV/15 veya 6.3 KV ANA TRANSFORMATÖR MERKEZLERİ MONTAJ PLÂNI (6 ADET 30 KV - 9 ADET 15 veya 6.3 KV. HÜCRELİ)			ÖLÇEK 1/50	
			NO.LU PLÂN İPTAL EDİLDİ	
			NO.LU PLÂN İPTAL EDİLDİ	
PROJİYİ YAPANIN, DİPL. NO. ÜNVANI, ADI, SOYADI	İMZA	İMZA TARİHİ	PLÂN NO 120-1/53	
YÜK. MÜH. HÜSEYİN BOĞUR OPA NO: 843			ARSİV KAYIT NO	
ÇİZEN: 				

1.40m²



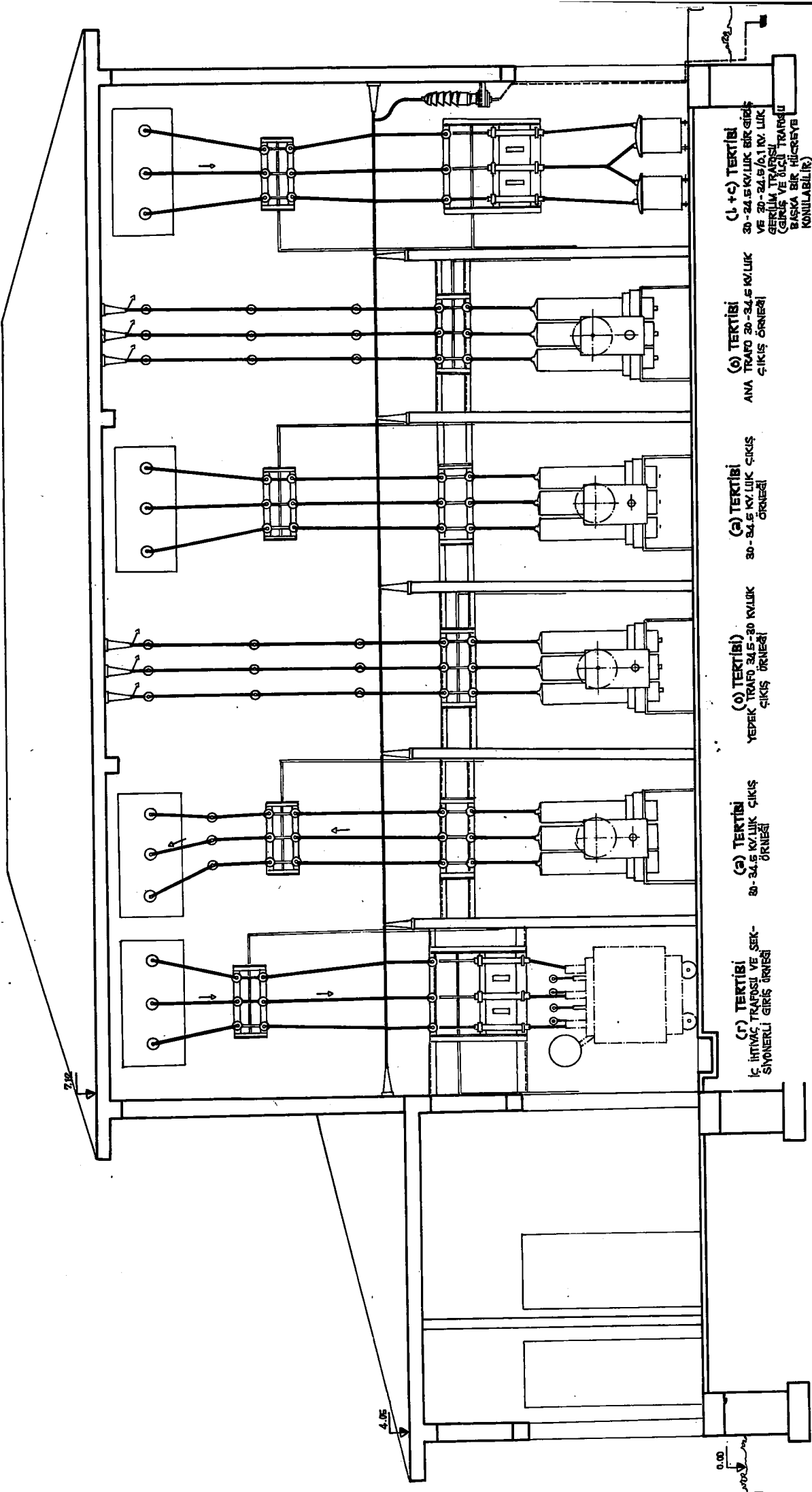




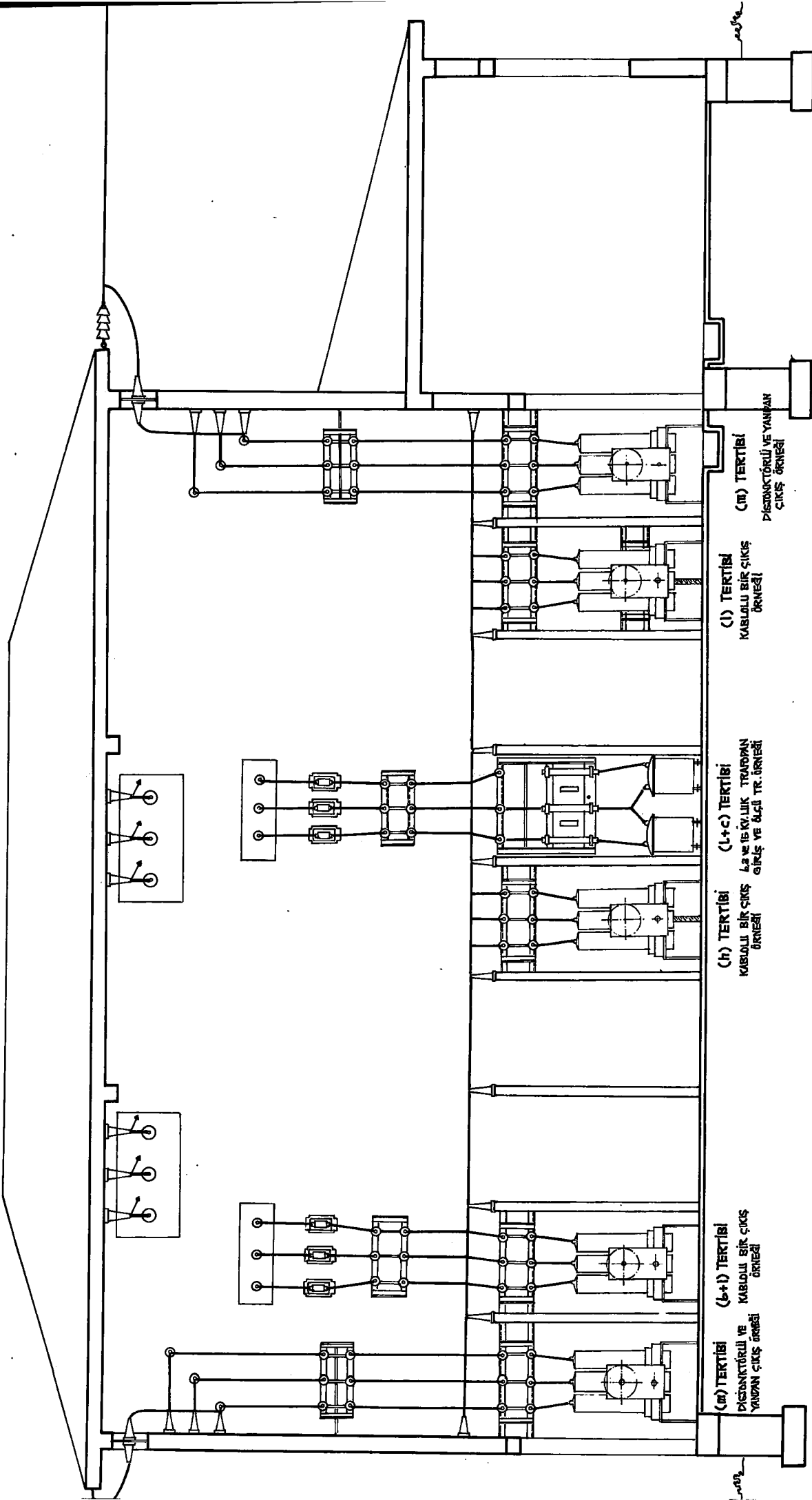
A - A KESİTİ

(1+2) TERTİBİ

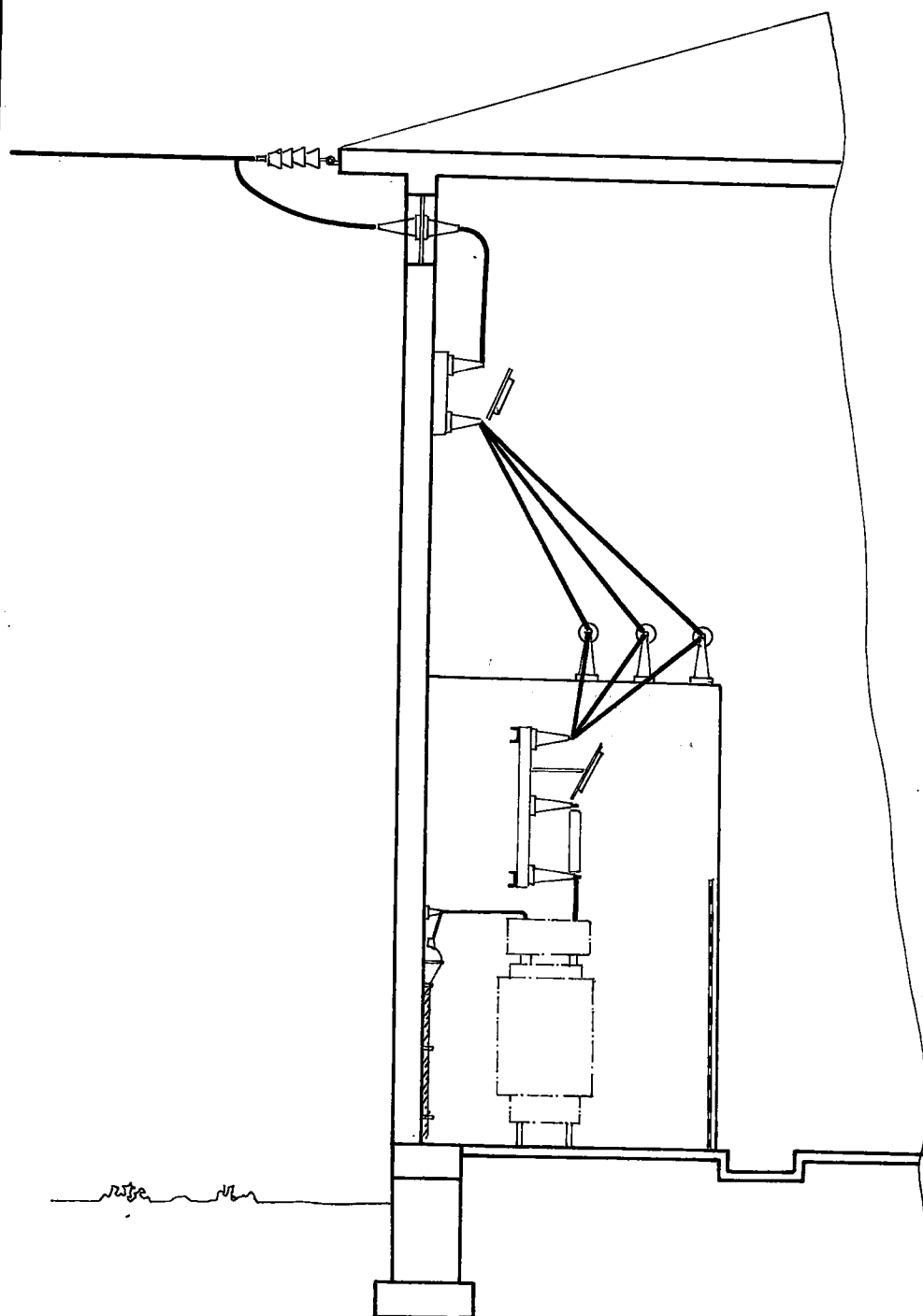
(0) TERTİBİ



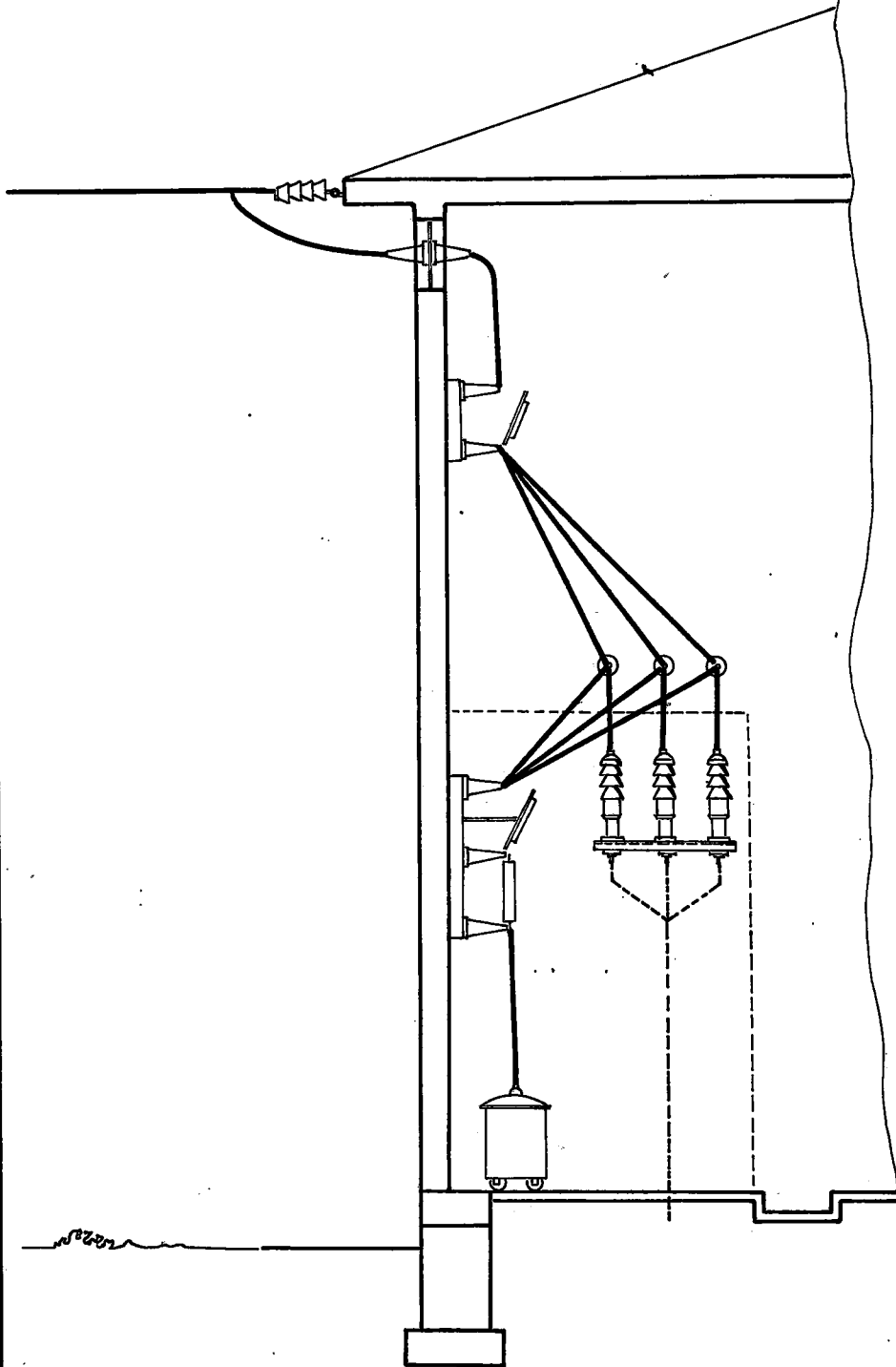
B-B KESİTİ



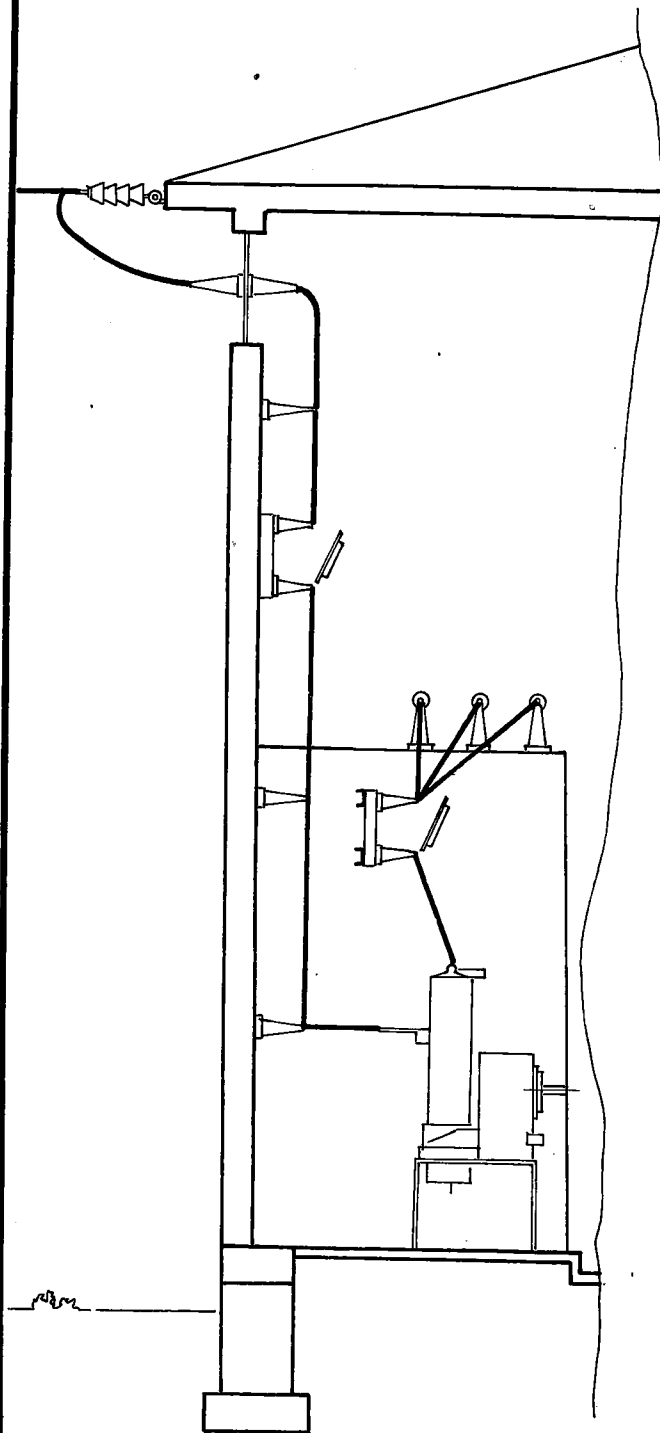
C-C KESİTİ



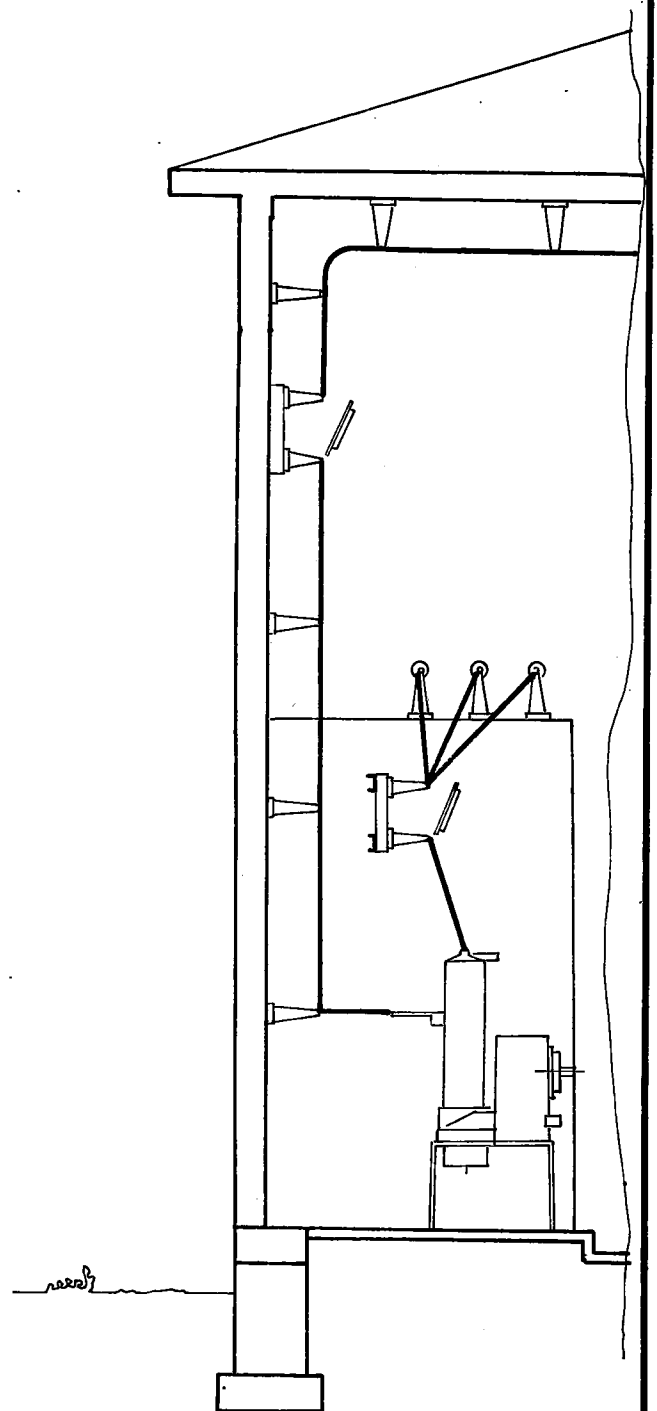
(r) TERTİBİ



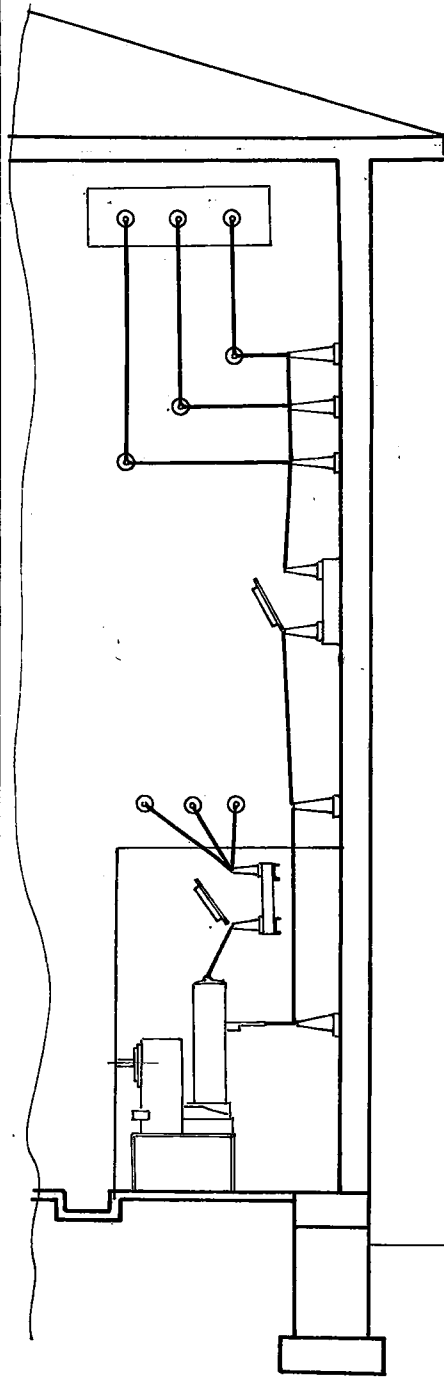
(1 + c) TERTİBİ



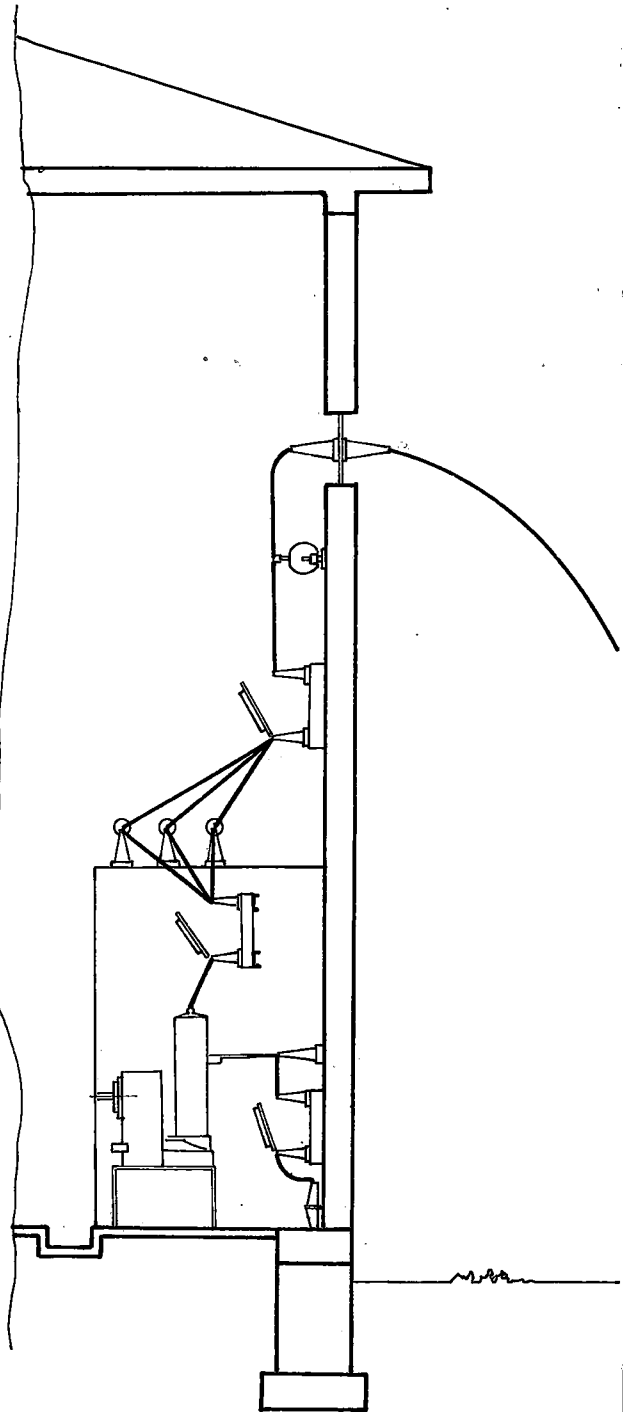
(a) TERTİBİ



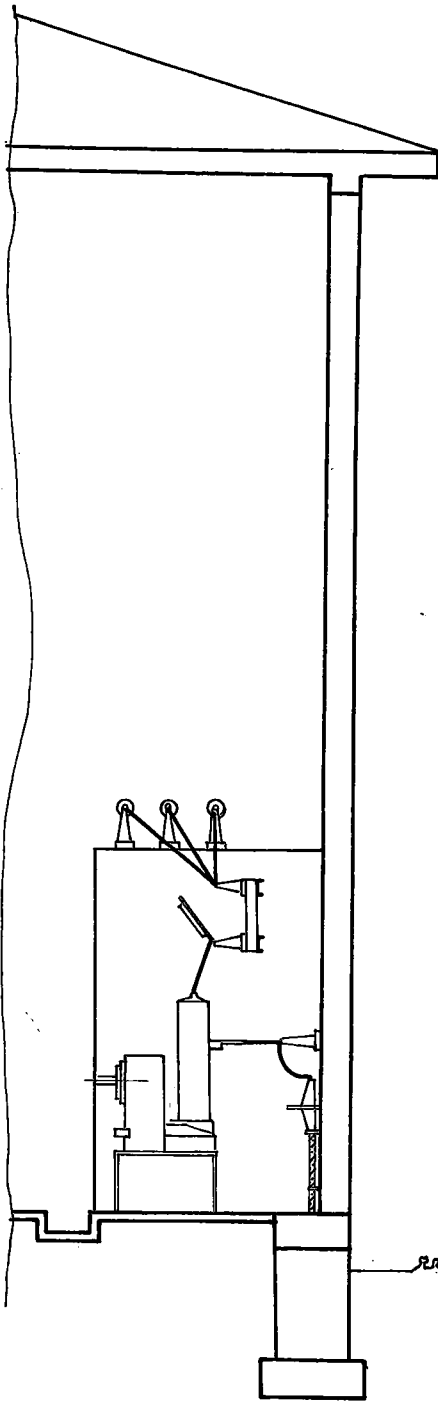
(o) TERTİBİ



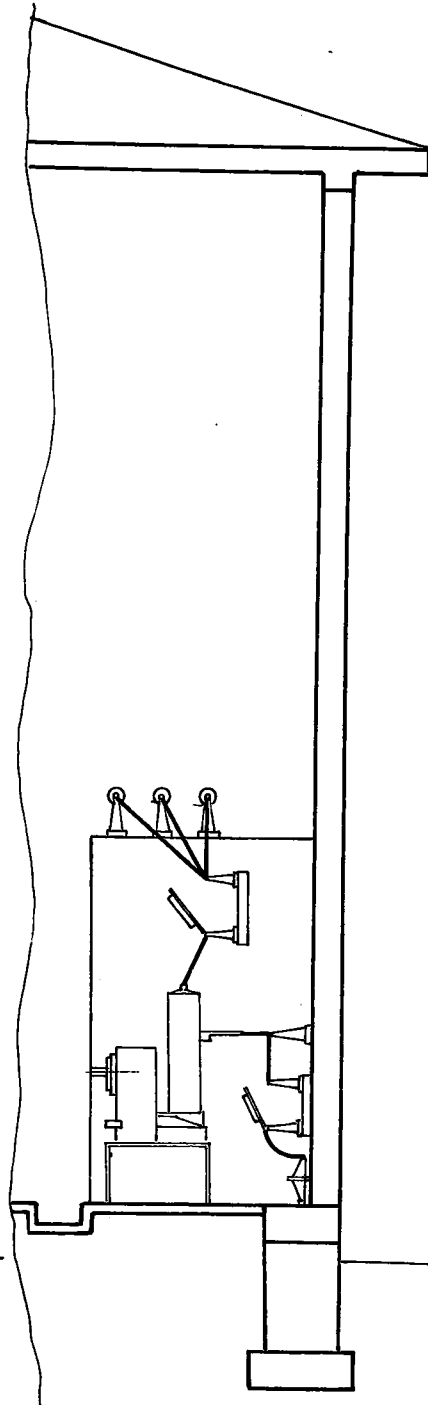
(m) TERTİBİ



(b+i) TERTİBİ

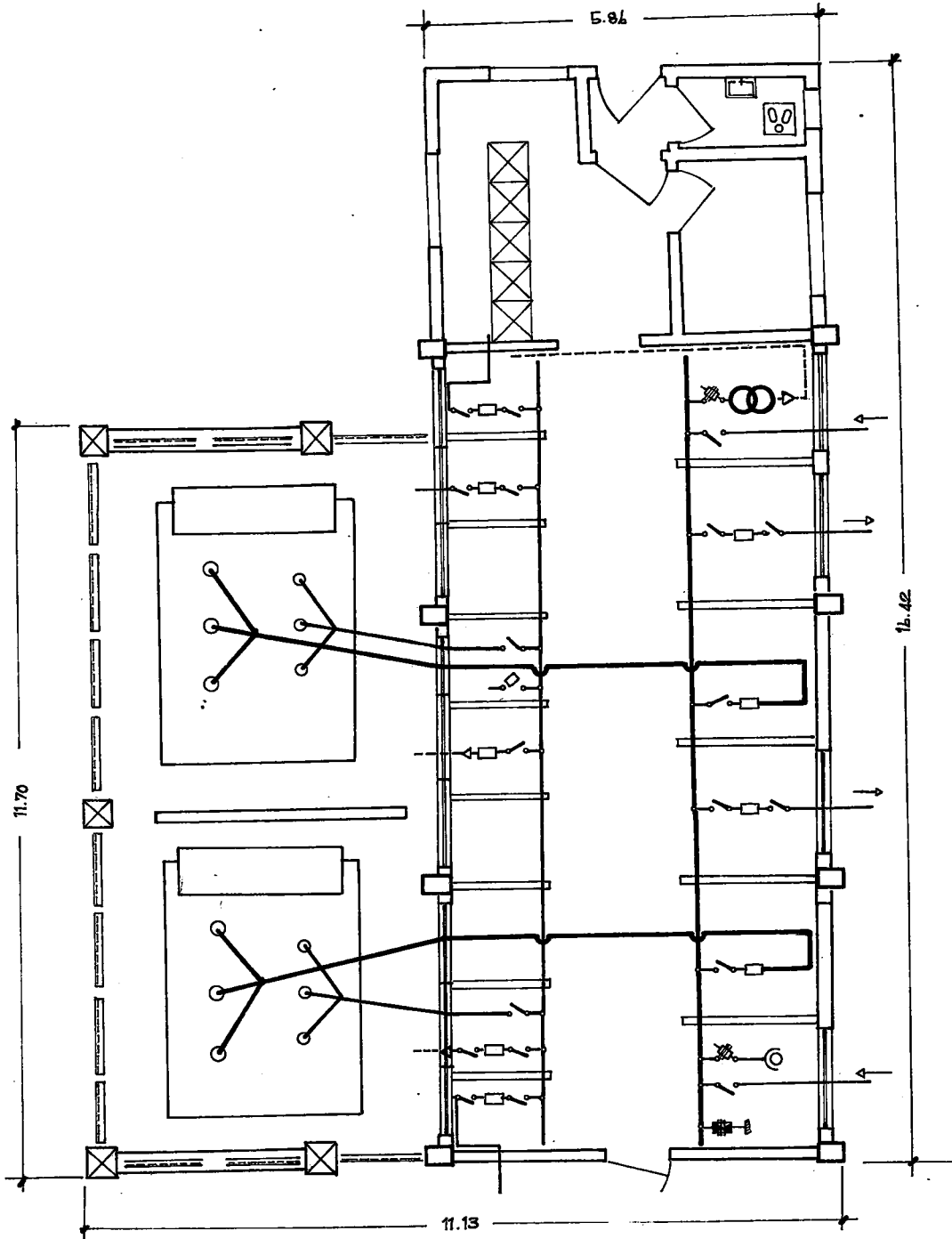


(h) TERTİBİ



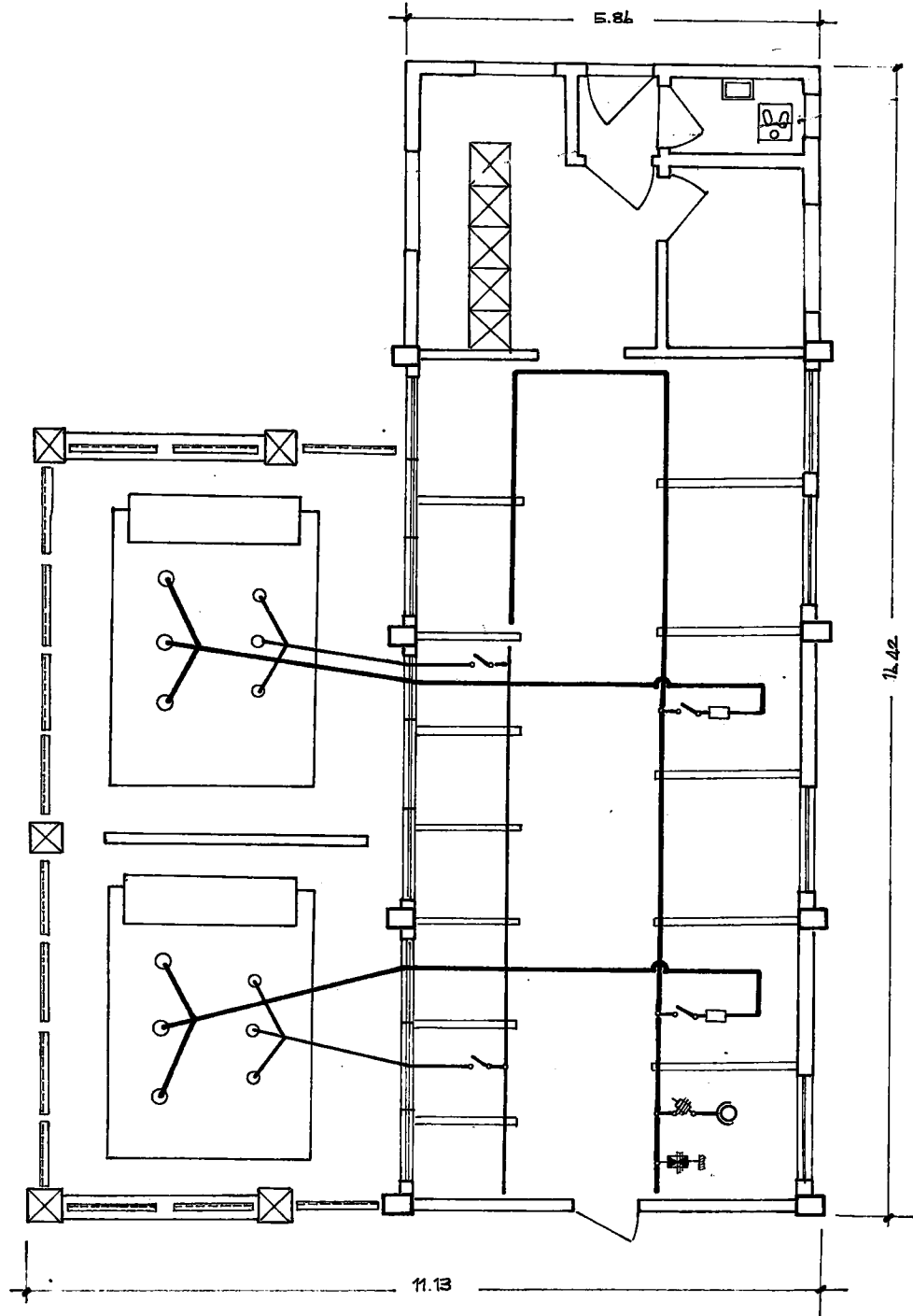
(i) TERTİBİ

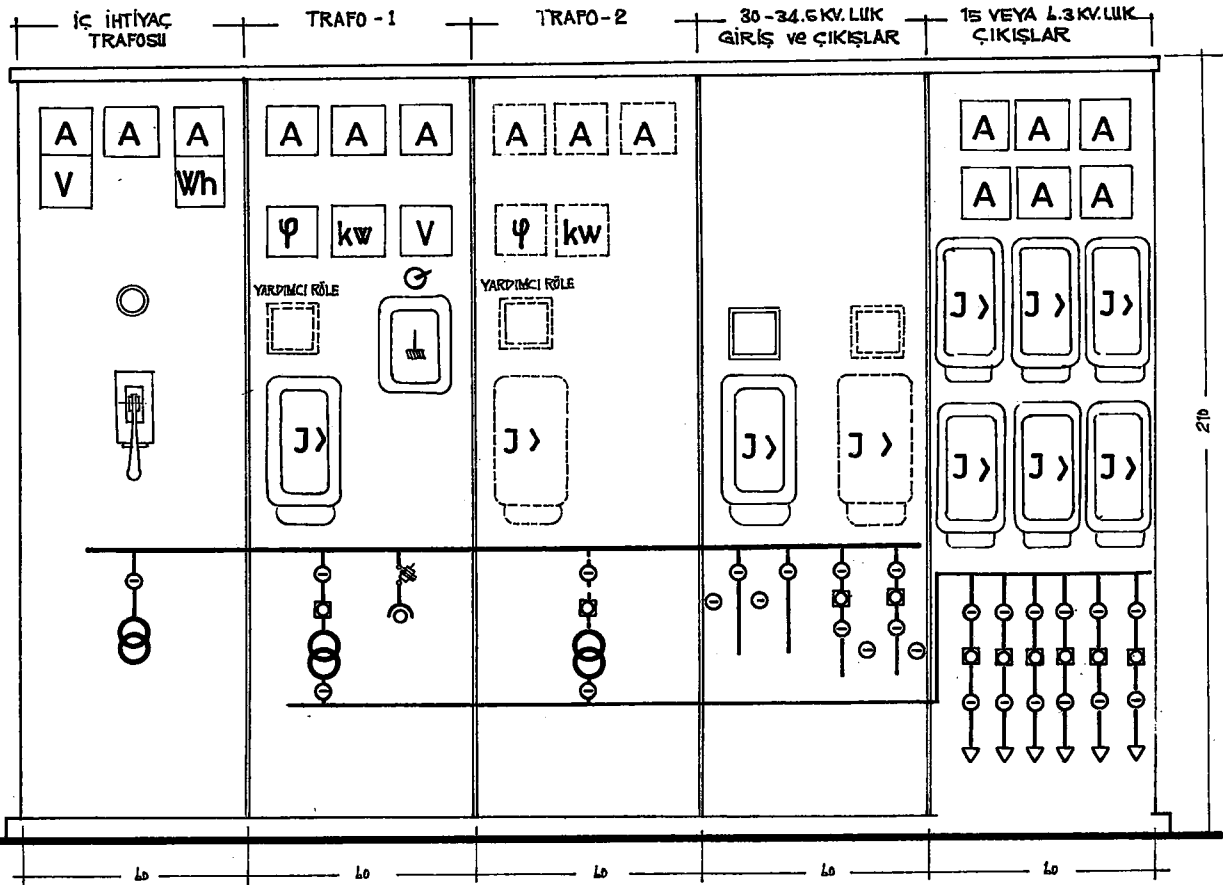
DAHA EVVEL ÇİZİLEN ŞEMA İLE BUNA UYGUN OLARAK YAPILAN MONTAJ ÖRNEKLERİ
1/100 ÖLÇEKLİ PLÂNDAN GENEL OLARAK AŞAĞIDA VERİLMİŞTİR.



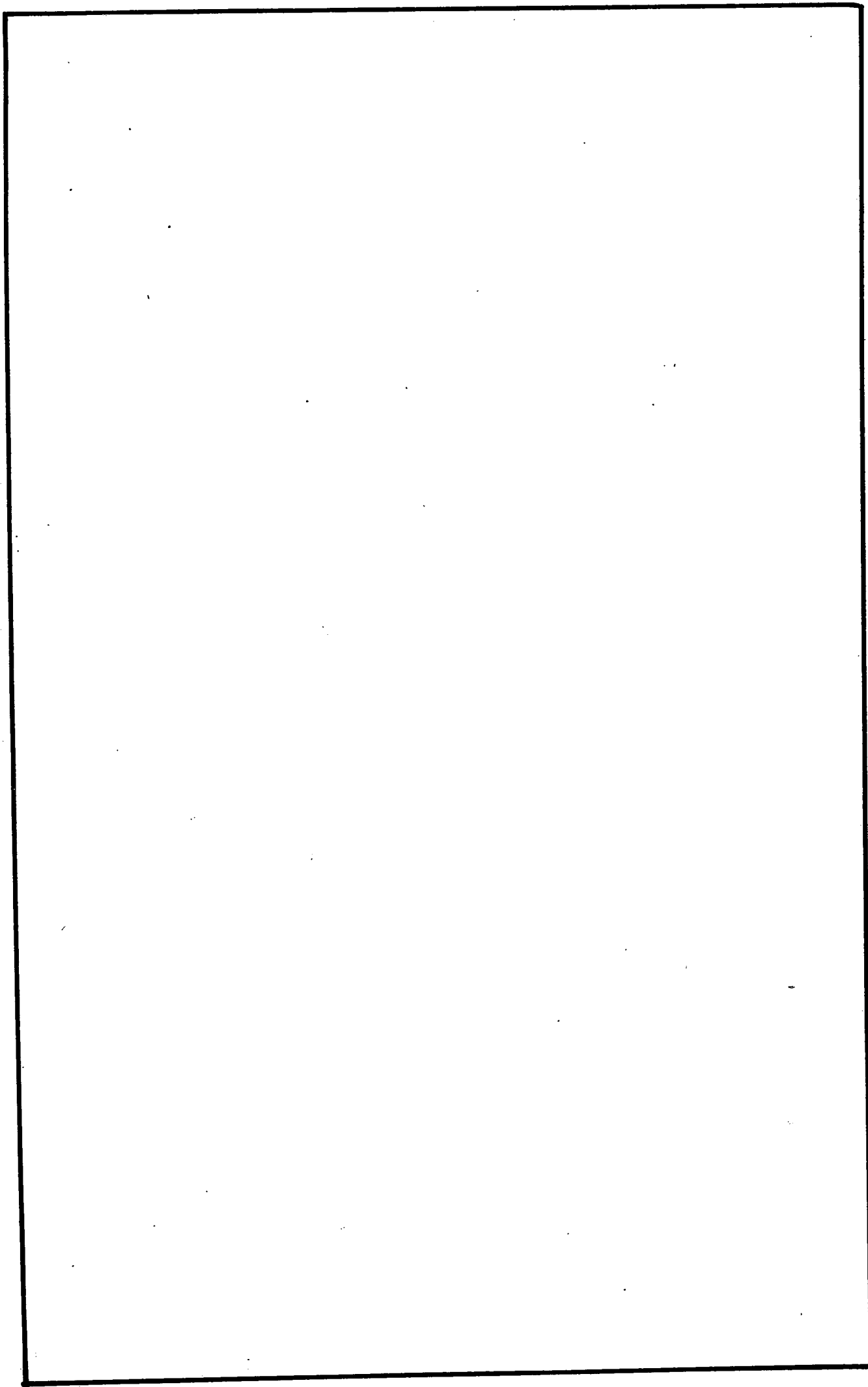
GENEL MONTAJ PLÂNI

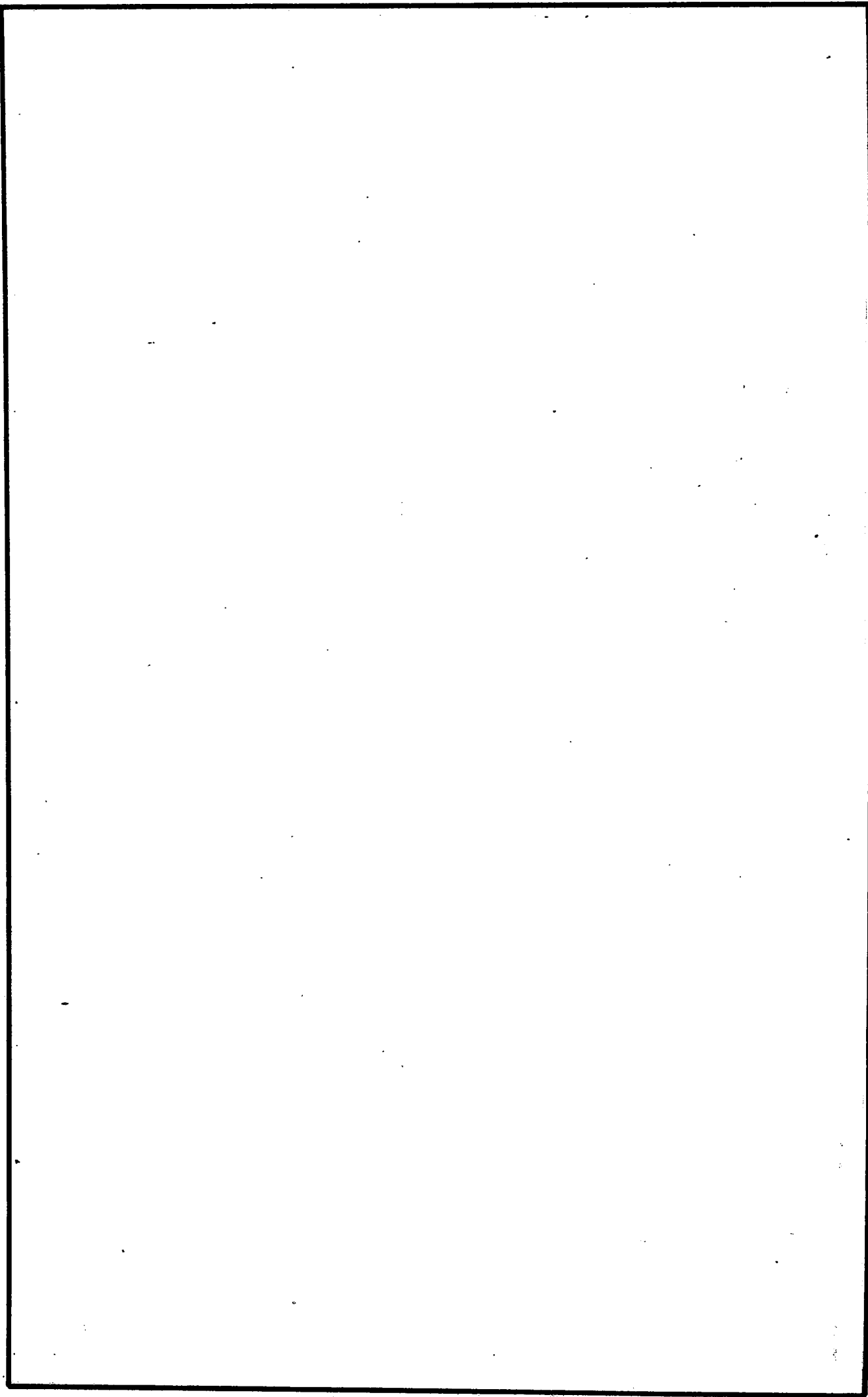
30-34.5 KV.LUK HÜCRELERİ İKİ ADET ARTTIRMAK İÇİN (6.3-15 KV) LUK(ÜÇ) HÜCRE
ŞEKİLDEKİ GİBİ (30-34.5)KV.LUK (İKİ) HÜCRE HALİNE GETİRİLEBİLİR.





KUMANDA ve ÖLÇÜ TABLOLARI



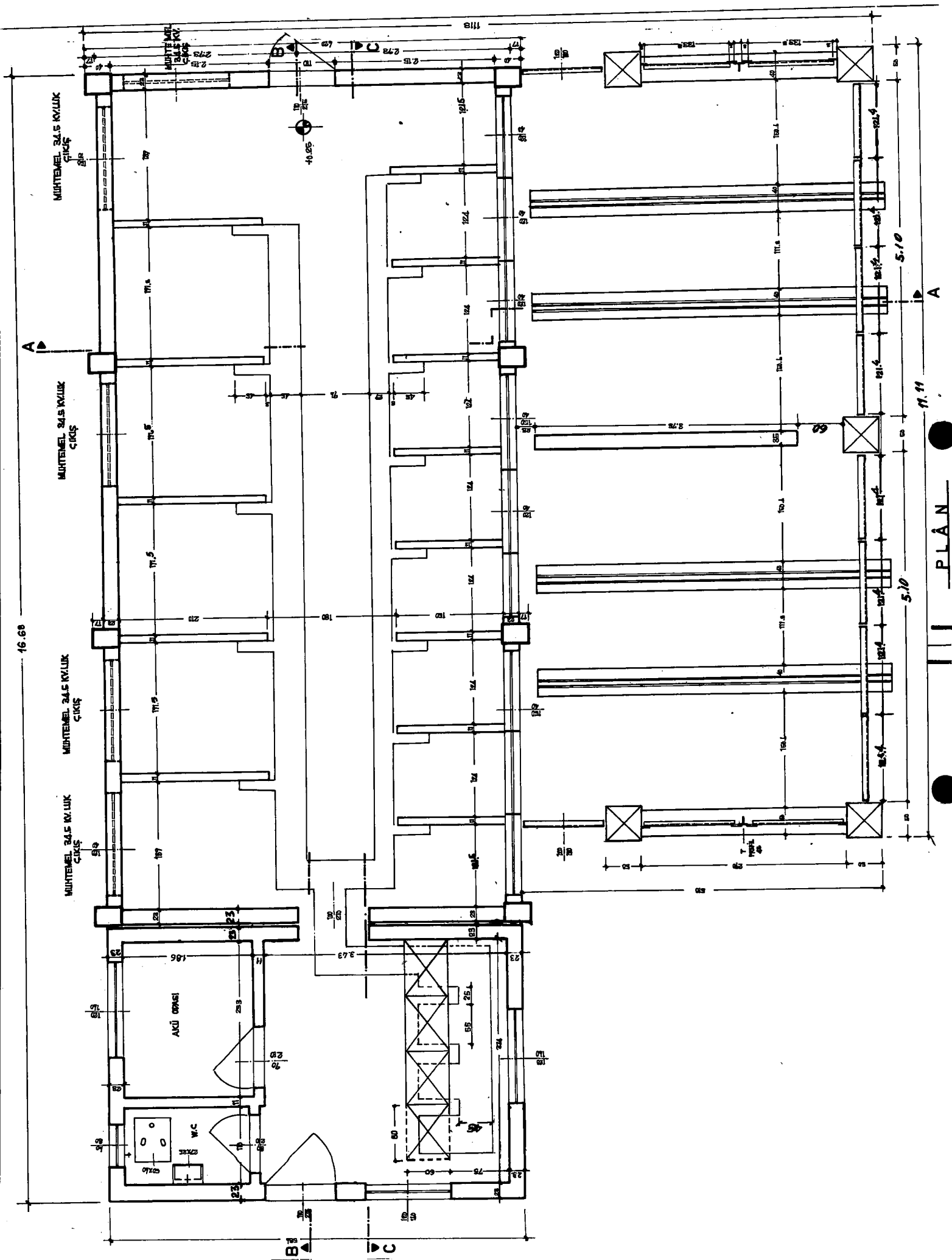


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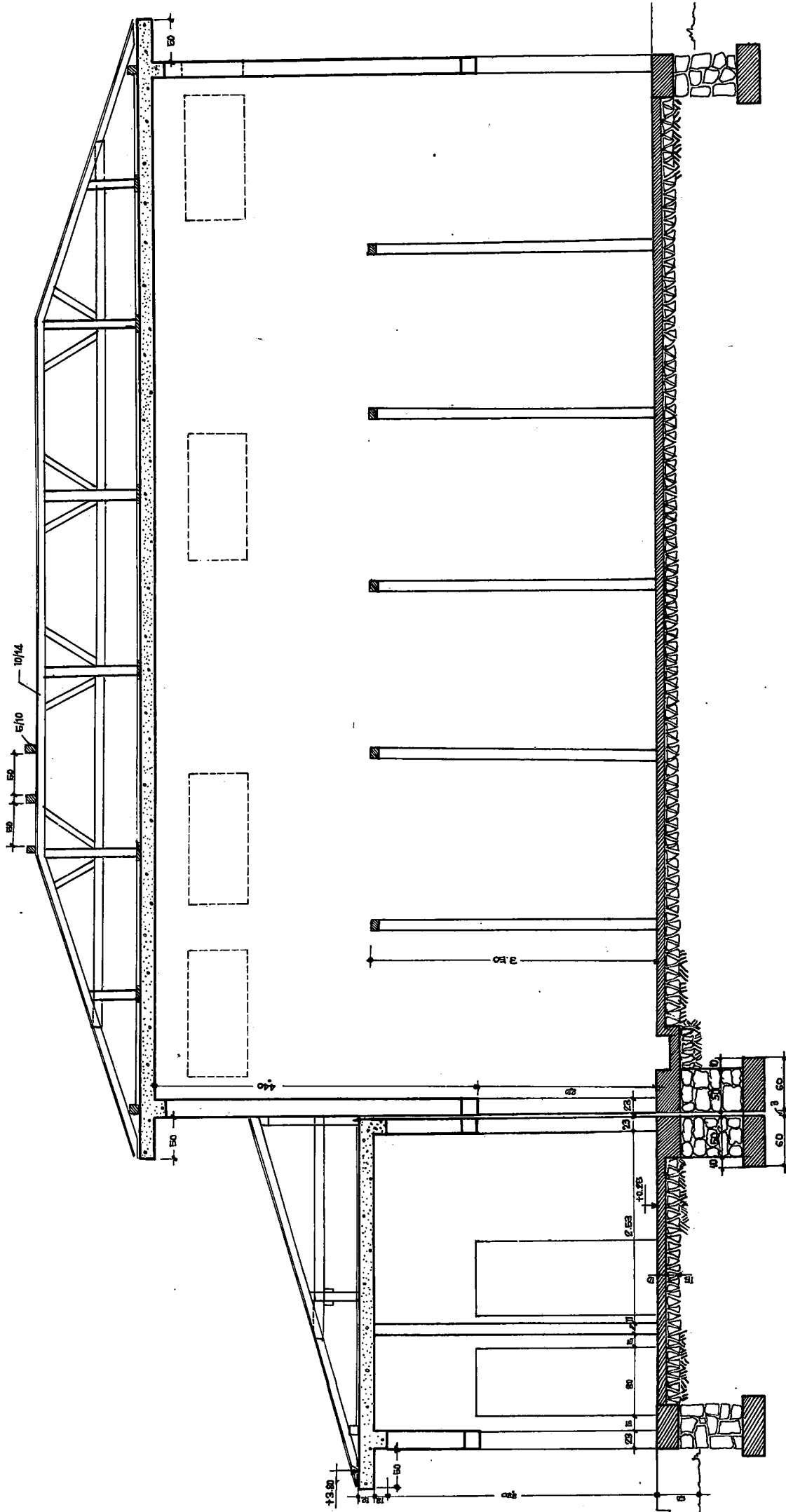
57

DEĞİŞİKLİK		TARİH	İMZA
a)			
b)			
KÜÇÜK TİP 30-34.5 KV/15 veya 6,3 KV ANA TRANSFORMATÖR MERKEZİ MİMARİ PROJESİ		ÖLÇEK 1/50	
		NO.LU PLÂN İPTAL EDİLDİ	
		NO.LU PLÂN İPTAL EDİLDİ	
		PLÂN NO 120-1 /54	
PROJEYİ YAPANIN DİPLOMA NO, ÜNVANI, ADI, SOYADI	İMZA	İMZA TARİHİ	İLLER BANKASI ENERJİ DAİRESİ REİSLİĞİ
YÜK. MÜH ÇETİN BEKİNER ODA NO : 8730 - DİPL NO : 4753 TELEFON : 174701			
SİZEN : 			ARŞİV KAYIT NO

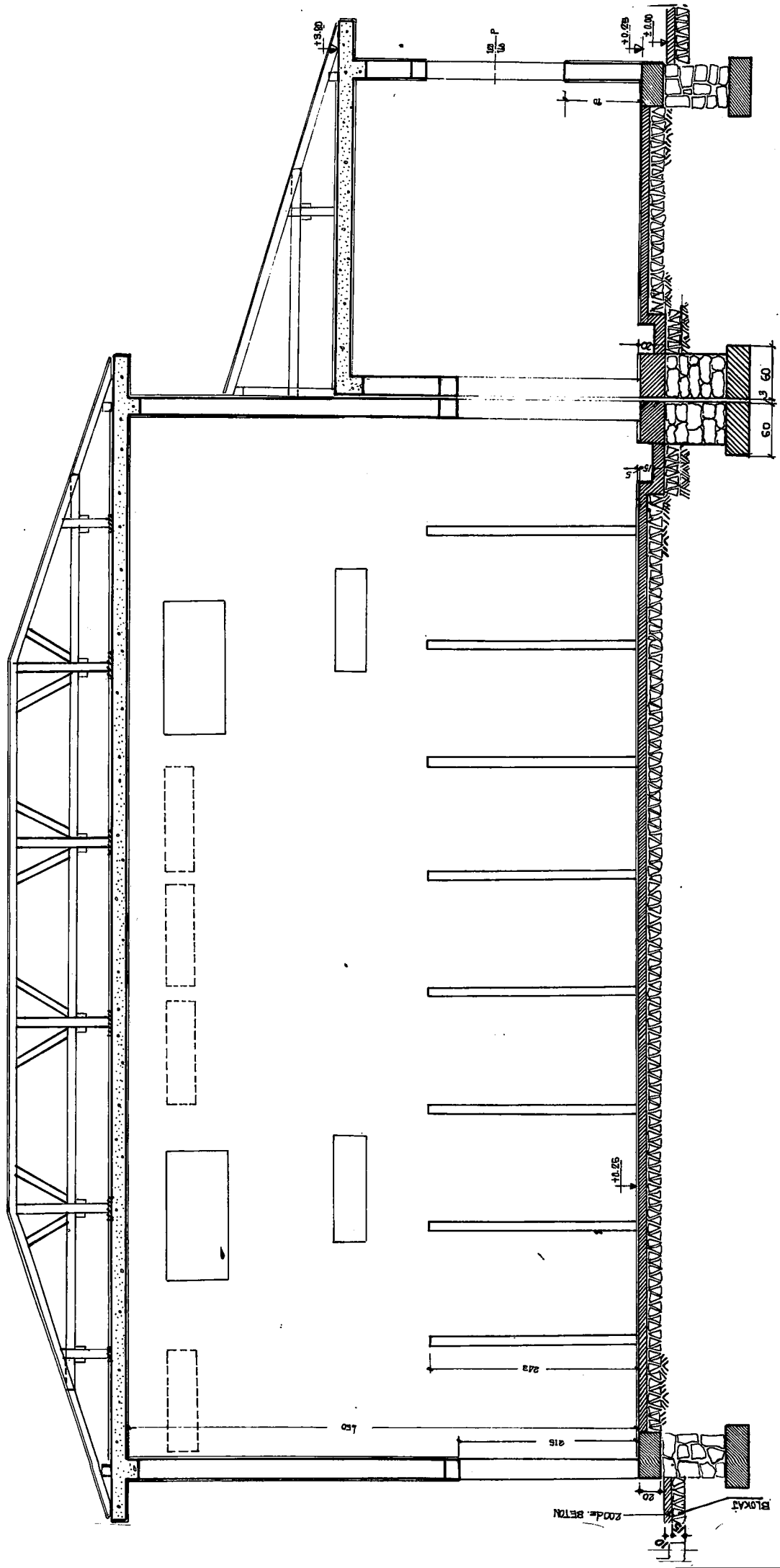


PLAN

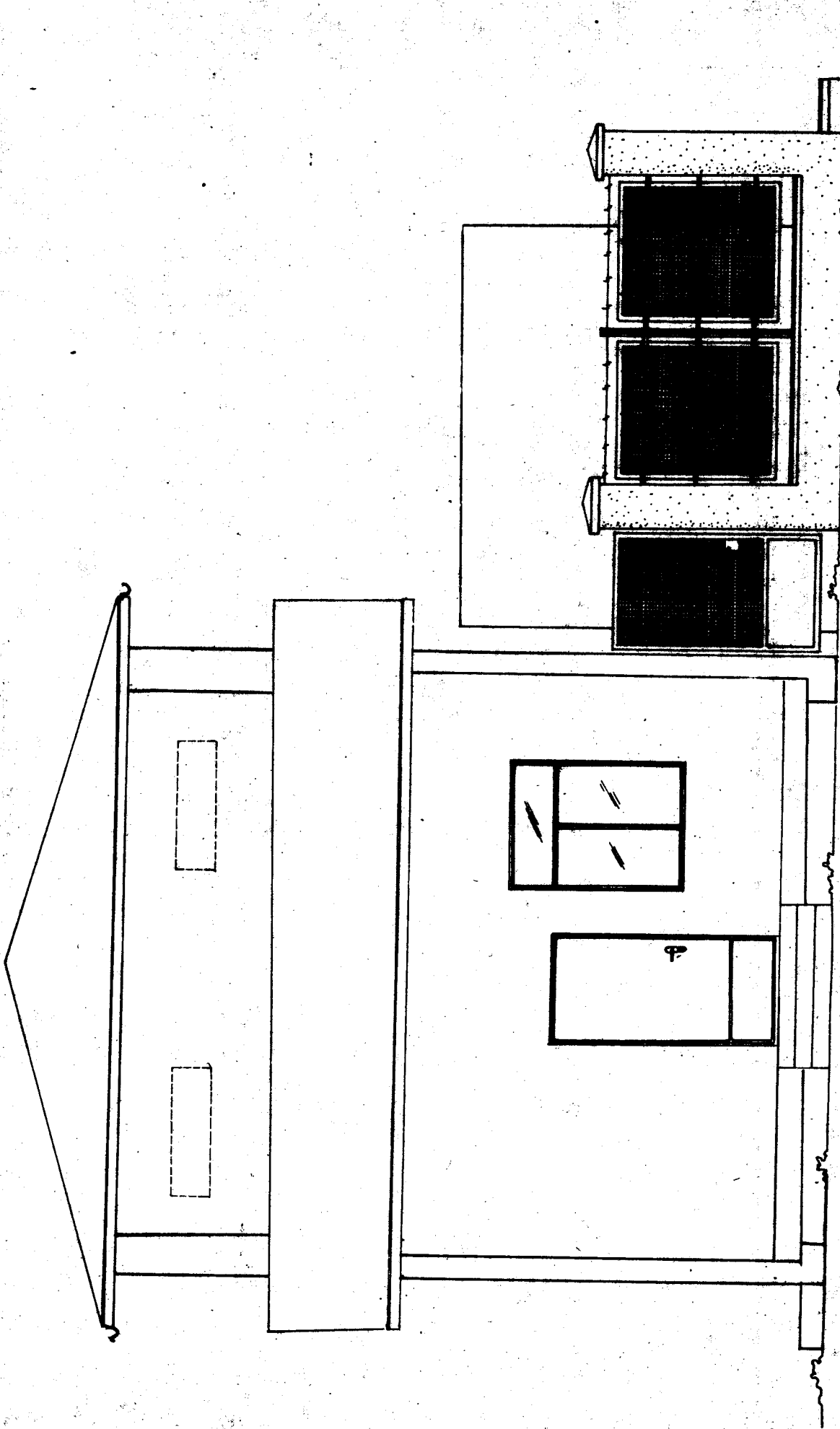
A-A KESİTİ



B-B KESİTİ

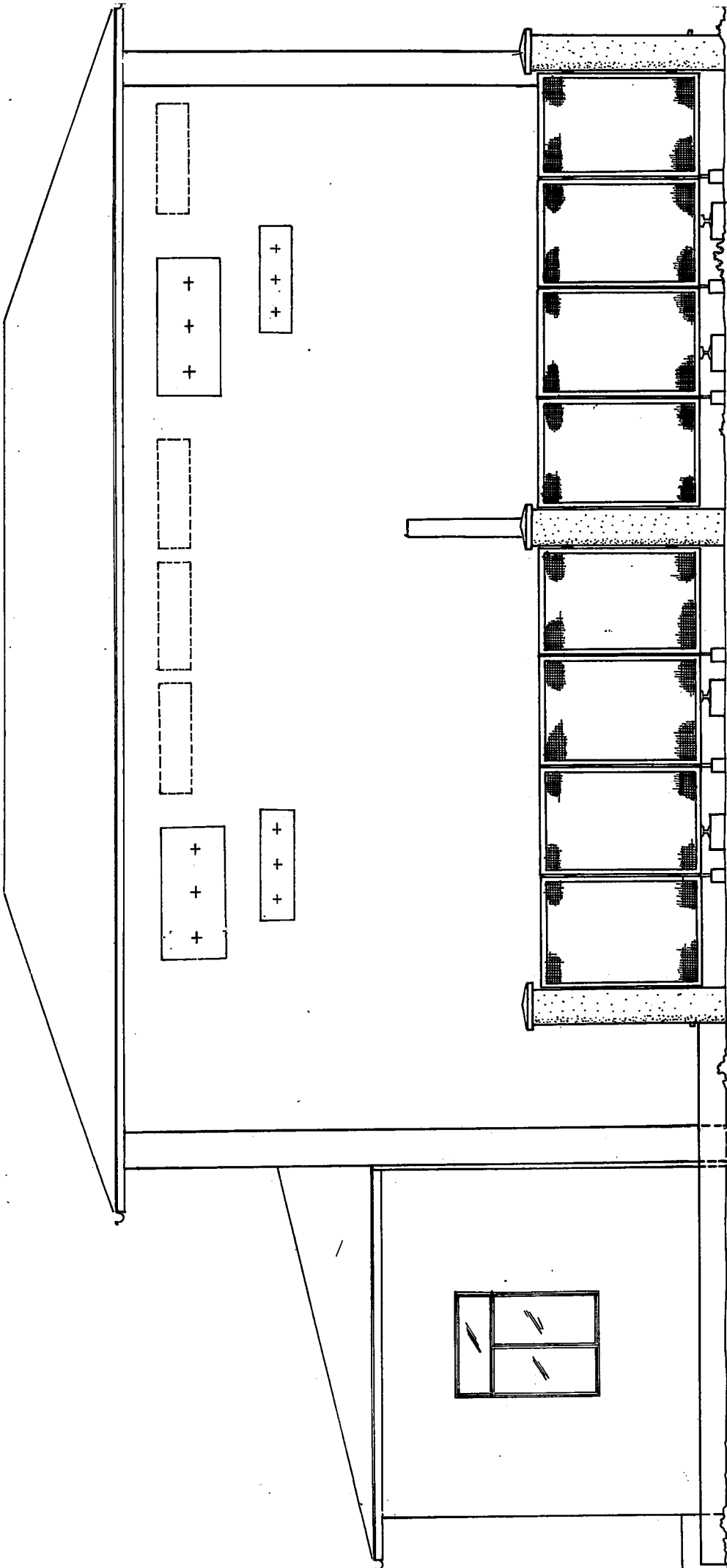


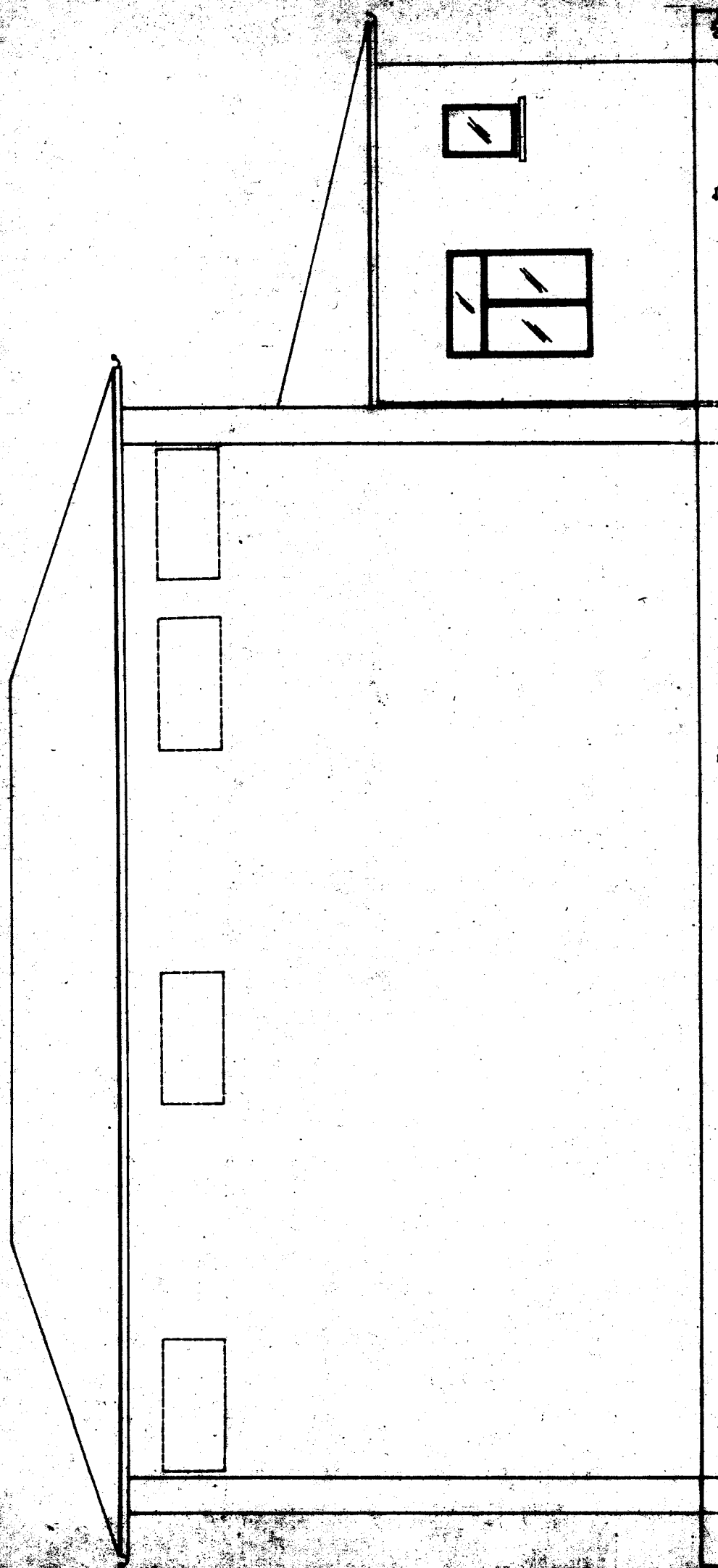
C-C KESITI



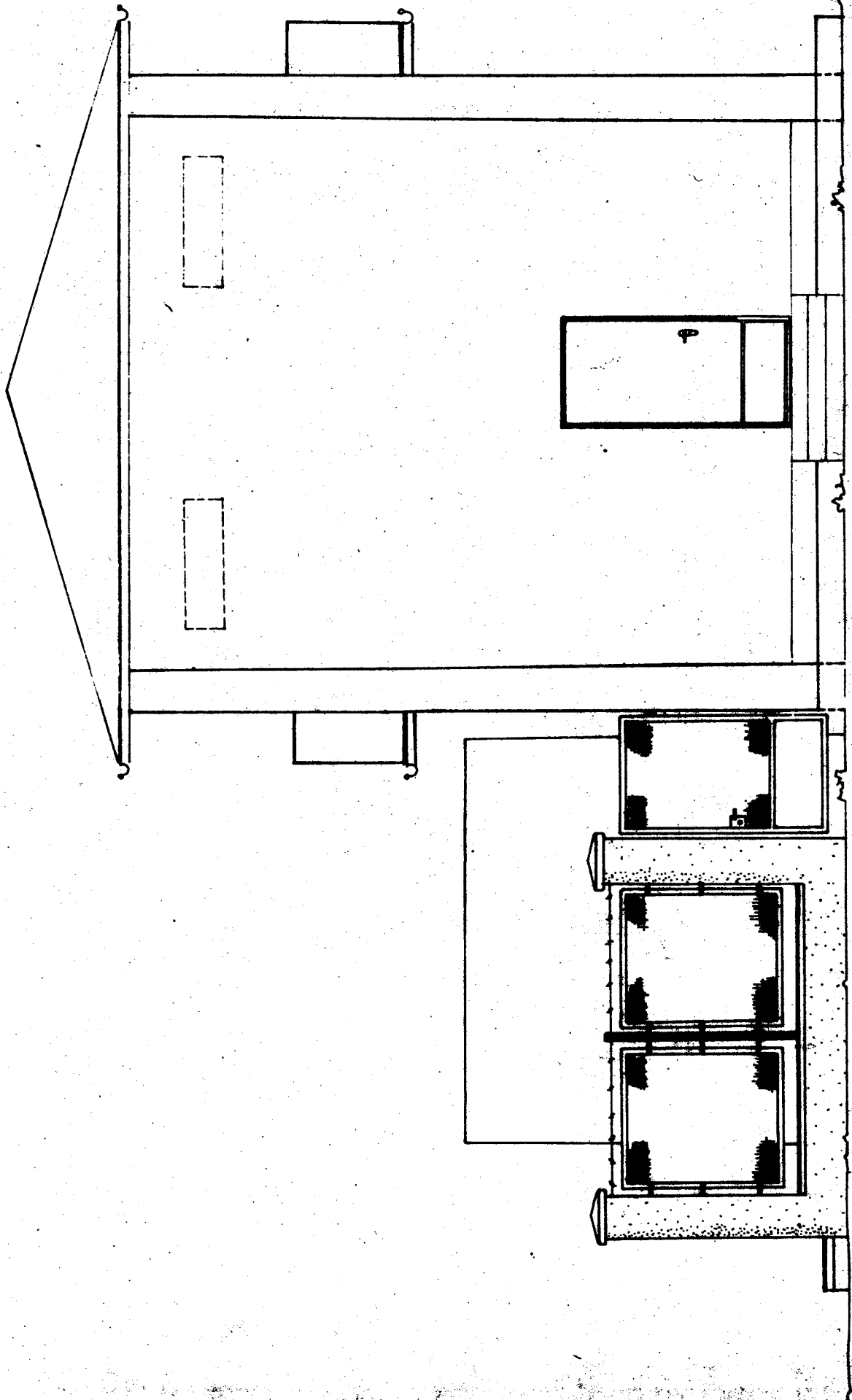
ÖN GÖRÜNÜŞ

SAĞ YAN CEPHE

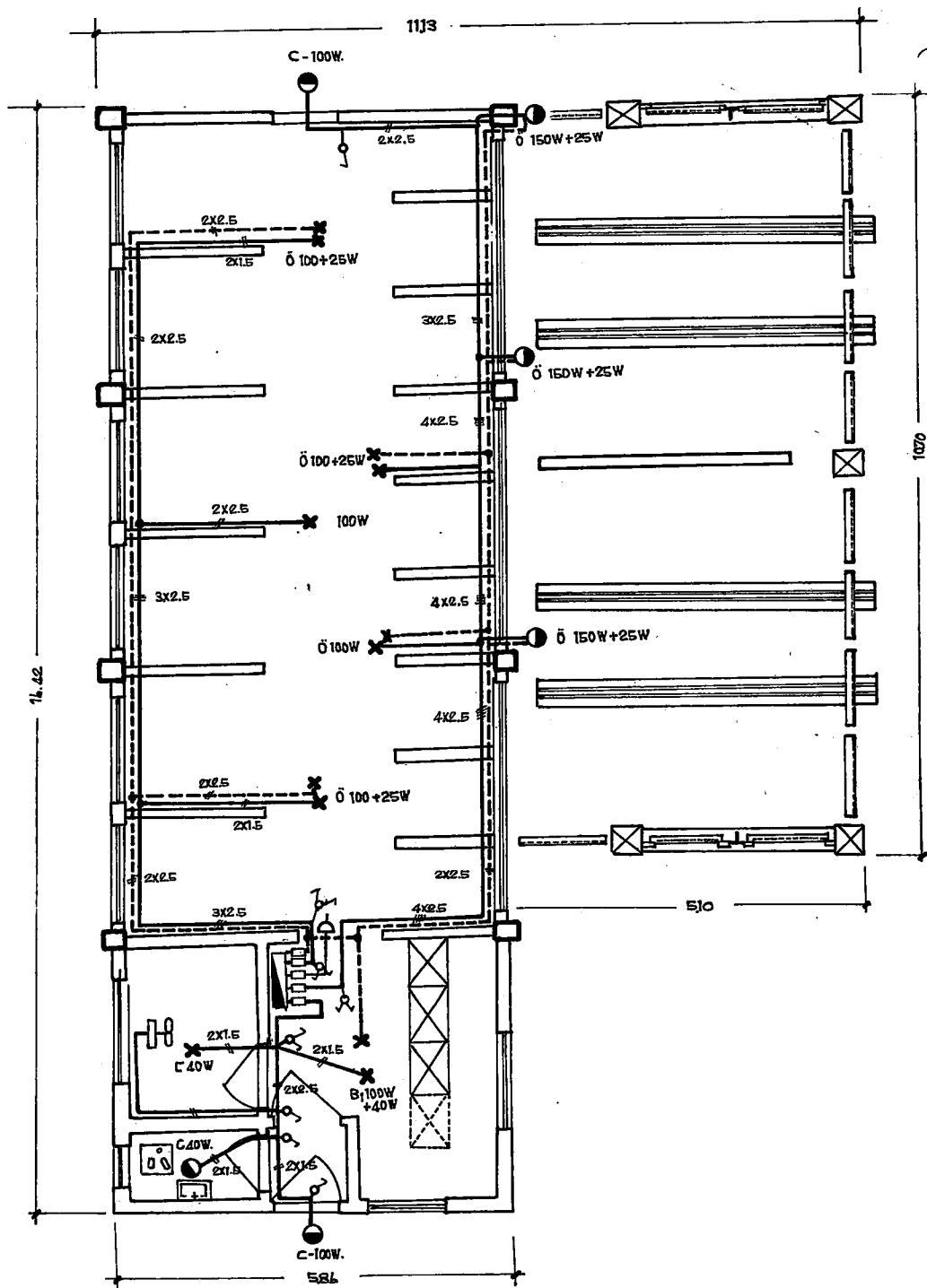




SOL VAN CERPE



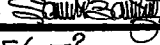
ARKA GÖRÜNÜŞ



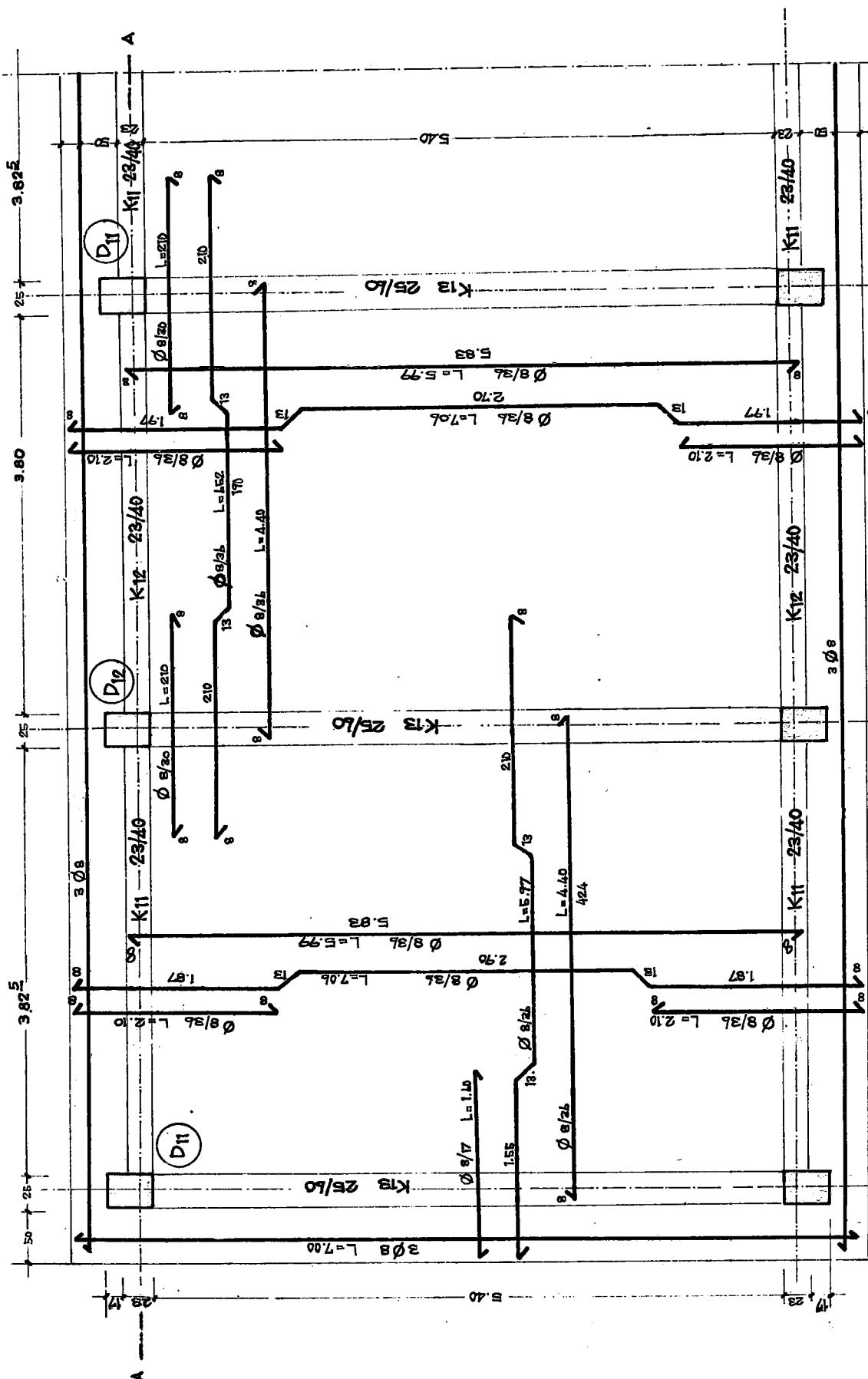
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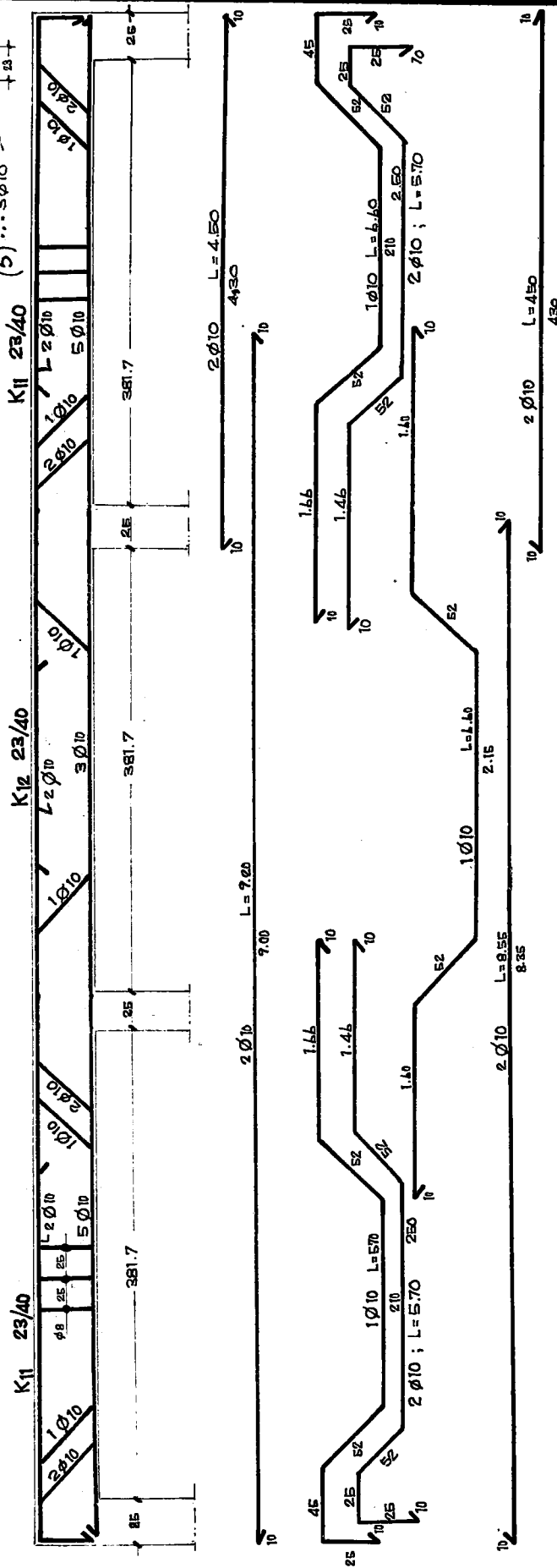
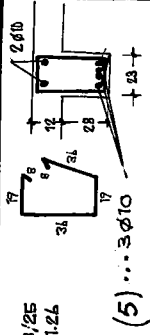
DEĞİŞİKLİK			TARİH	İMZA
a)				
b)				
30 - 34,5 / 15 - 6,3 KV TEVZİ MERKEZİ BETONARME VE TEMEL PLÂNLARI (Küçük tip bina)			ÖLÇEK 1/50 - 1/100	
			NO.LU PLÂN İPTAL EDİLDİ	
			NO.LU PLÂN İPTAL EDİLDİ	
			PLÂN NO 120-1/55	
PROJEYİ YAPANIN DİPLOMA NO, ÜNVANI, ADI VE SOYADI	İMZA	İMZA TARİHİ	İLLER BANKASI ENERJİ DAİRESİ REİSLİĞİ	
MÜH. CETİN PEKİNER OPA NO : 8730 - DİPL.NO : 4753 TELEFON : 1747 01				
ÇİZEN : 			ARSİV KAYIT NO 1	

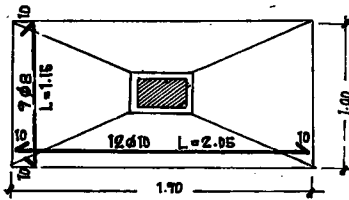
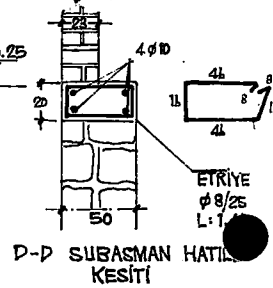
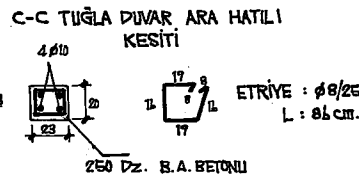
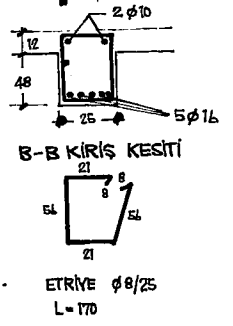
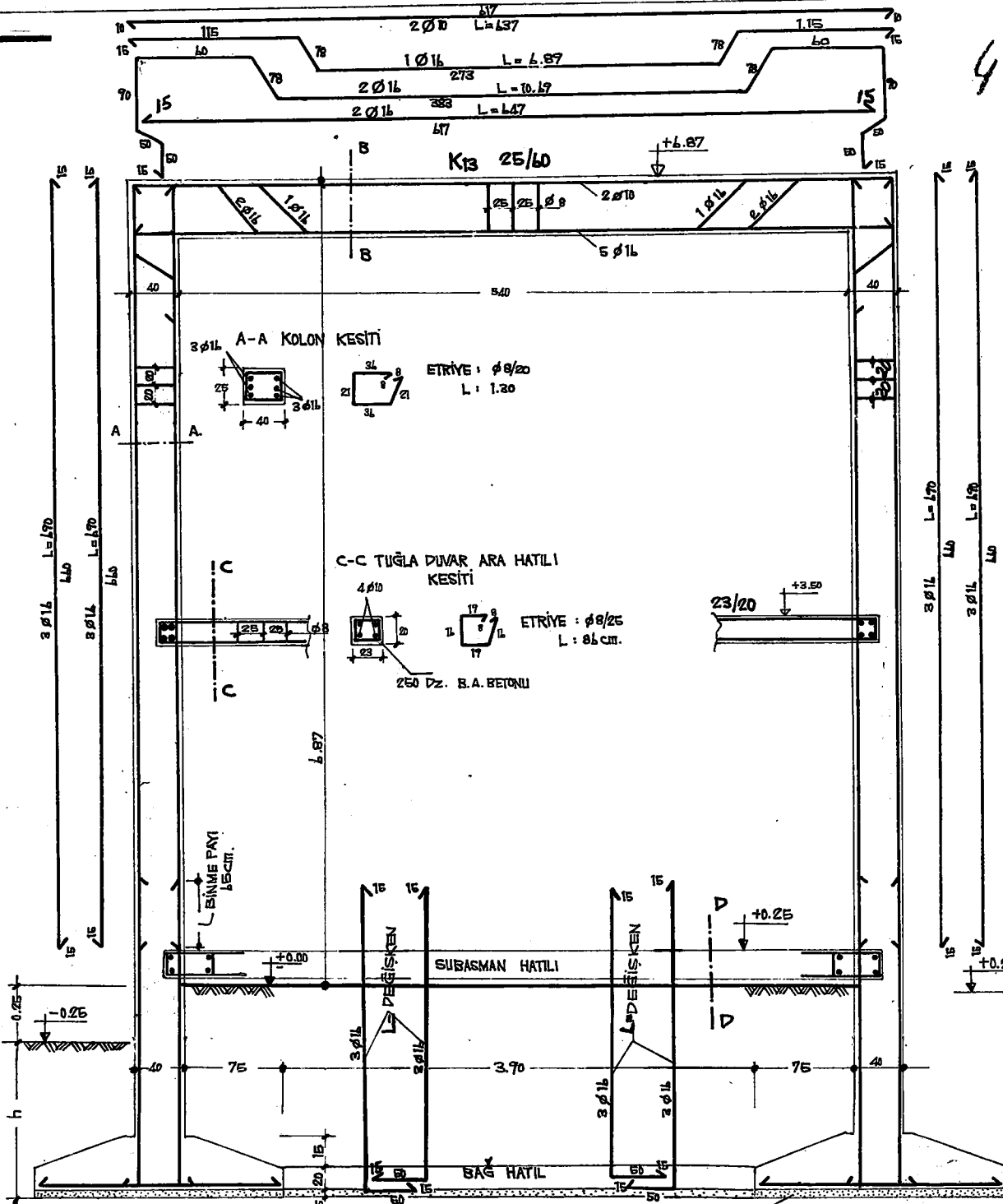
0.56 m²



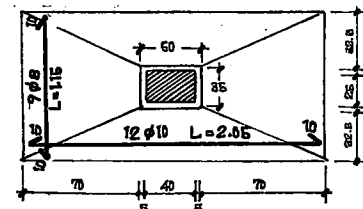
A-A EKSENİ KESİTİ

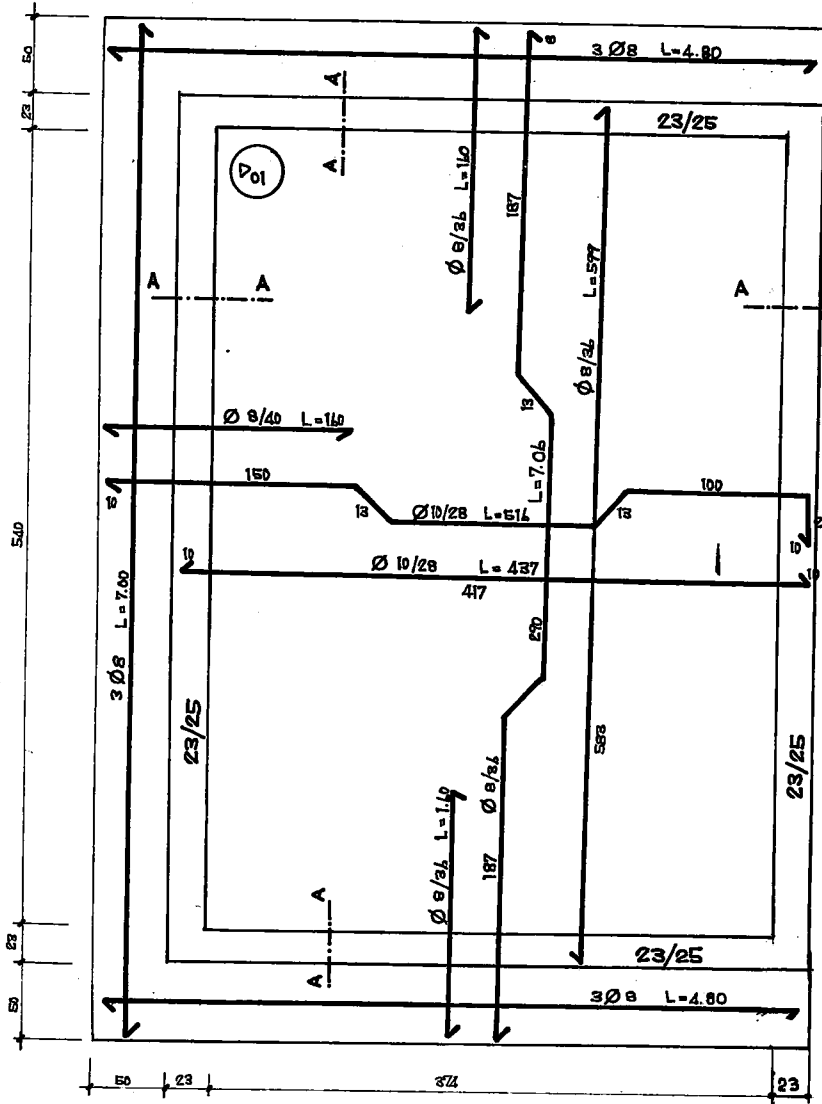
ETRIYE Ø 8,25
L = 1.26



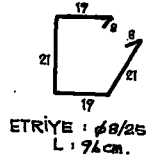
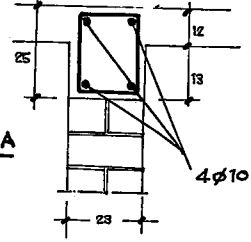


NOT: h (1.00) m. den AZ OLMAMAK ÜZERE MAHALLİNDE KONTROLLÜKÇA TESPİT EDİLECEKTİR.

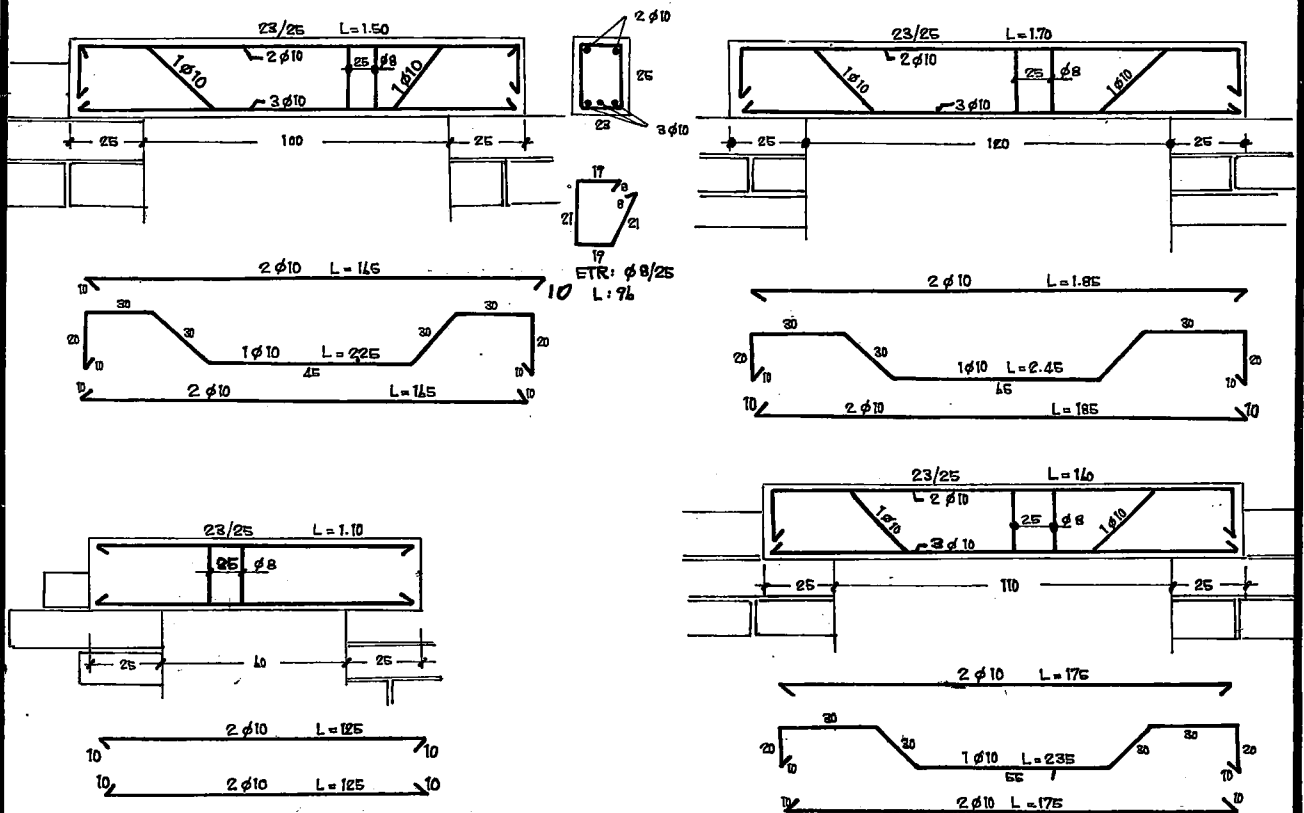


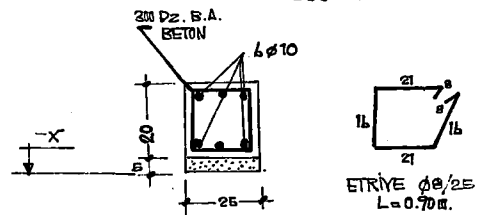
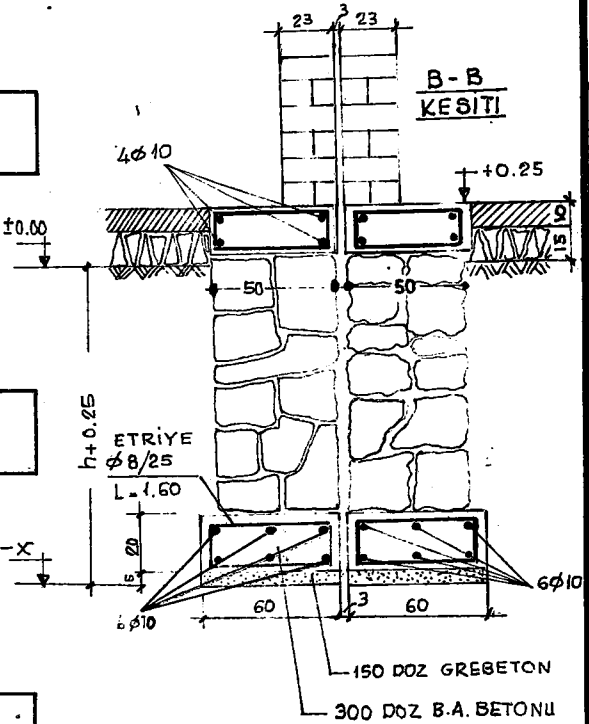
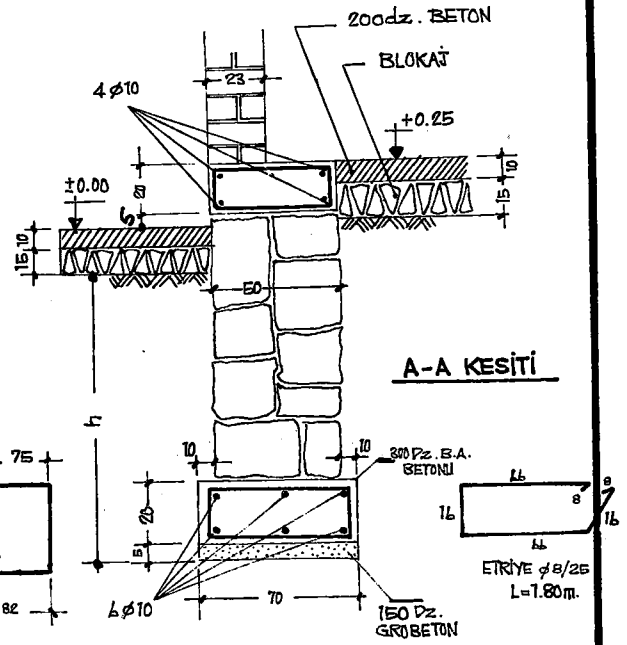
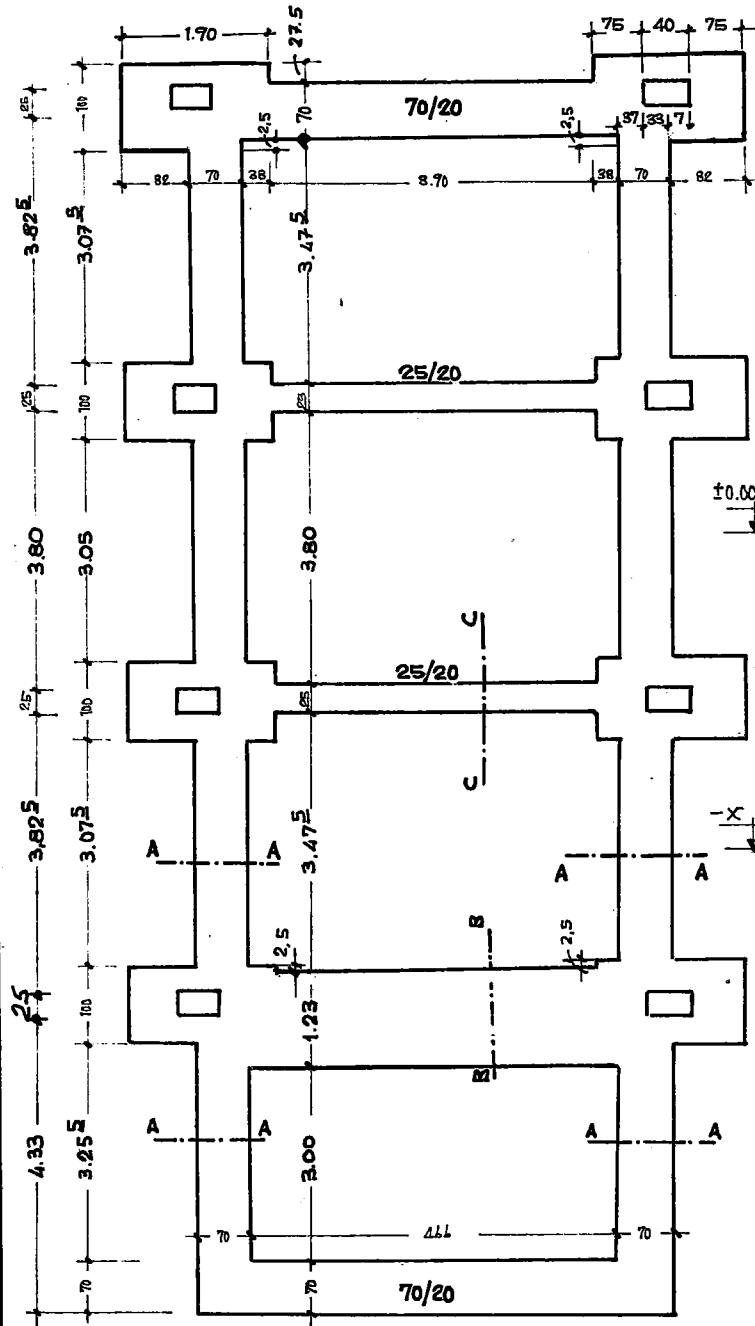


A-A HATIL KESİTİ



KAPI VE PENCERE ÜSTÜ LENTOLARI

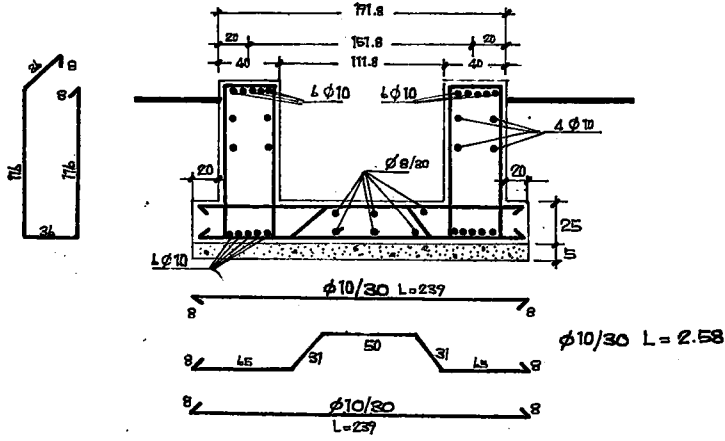




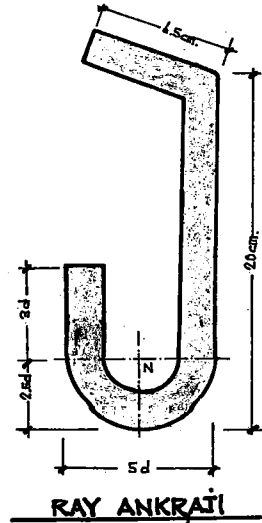
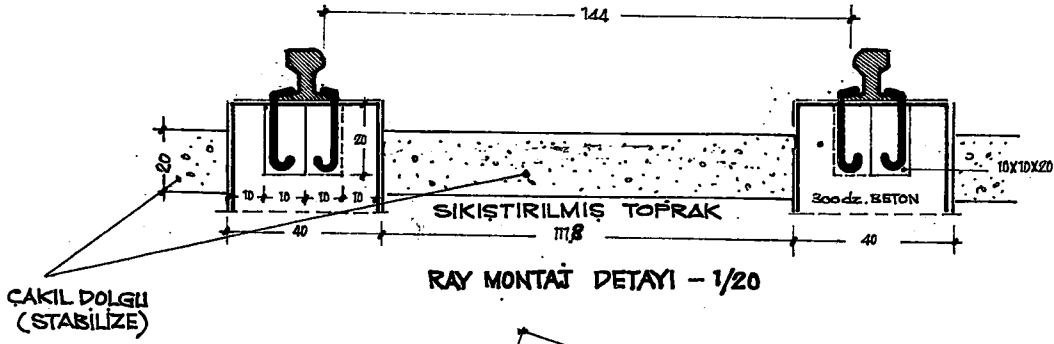
NOT : BAĞLANTI HATILI (25/20) SÖMELLE BİRLEŞECEKTİR.

HARİCİ TİP TAKAT TRANSFORMATÖRÜ TEMEL DETAYI

$\phi 10$
L=3.20



B-B KESİTİ



NOT : (d) DEMİR ÇAPİ
 $\phi 16$ İNŞAAT DEMİRİNDEN YAPILACAKTIR.

$$\text{Max } M_x = \alpha_6 q l x^2 = 0.02934 \times 0.520 \times 4.05^2 = 0.250 \text{ tm.}$$

$$\text{Max } M_y = \beta_6 q l y^2 = 0.00764 \times 0.520 \times 5.63^2 = 0.126 \text{ tm.}$$

$$x = -\frac{1}{12} \alpha_6 q l x^2 = -\frac{1}{12} \times 0.7935 \times 0.520 \times 4.05^2 = -0.564 \text{ tm.}$$

$$y = -\frac{1}{12} \beta_6 q l y^2 = -\frac{1}{12} \times 0.2065 \times 0.520 \times 5.63^2 = -0.284 \text{ tm.}$$

Saçak tahkiki:

$$M = \frac{0.520 \times 0.62^2}{2} = -0.10 \text{ tm.}$$

DONATI HESAPLARI : (Salinger tablolarından) min. donatı açıklığı = $1.5 \times 12 = 18 \text{ cm.}$

X doğrultusu DII : $M = 24.4 \text{ tm. } h = 10 \text{ cm. } G_b = 25 \text{ kg/cm}^2 \quad f_e = 1.88 \text{ cm}^2$

Donatı $\phi 8/18$ (1plye 1düz)

DII : $M = 25.0 \text{ tm. } h = 10 \text{ cm. } G_b = 25 \text{ kg/cm}^2 \quad f_e = 1.93 \text{ cm}^2$

Donatı $\phi 8/18$ (1plye 1düz)

DII Dis Mesnet $x = 56.4 \quad h = 10 \text{ cm. } G_b = 41 \text{ kg/cm}^2 \quad f_e = 4.4 \text{ cm}^2$

Mevcut Donatı : $\phi 8/36$

ilave " : $\phi 8/17$

DII Ara Mesnet $x = 56.4 \quad h = 10 \text{ cm. } G_b = 41 \text{ kg/cm}^2 \quad f_e = 4.4 \text{ cm}^2$

Mevcut Donatı : $\phi 8/18$

ilave " : $\phi 8/30$

Y Doğrultusu:

DII döşemesi $M = 12.4 \quad h = 9.5 \text{ cm. } G_b = 17 \text{ kg/cm}^2 \quad f_e = 1.00 \text{ cm}^2$

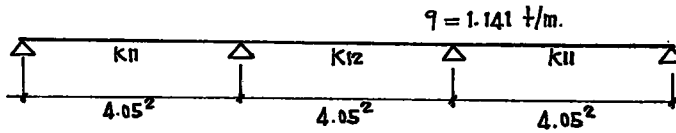
Minimum Donatı $\phi 8/18$

DII Mesnetleri $x = 28.4 \text{ tm. } h = 10 \text{ cm. } G_b = 27 \quad f_e = 2.2 \text{ cm}^2$

Mevcut Donatı : $\phi 8/36$

ilave " : $\phi 8/36$

Not: Saçak mesnet momenti iç mesnet momentinden küçük -
olduğundan ayrıca ilave donatı konmayacak.

K11 - K12 - K12 - K11 MÜTEMADI KIRIŞLARI :YÜKLER :

$$\text{Döşemeden} = 0.313 \times 0.520 \times 4.05^2 = 0.660 \text{ t/m.}$$

$$\text{Sacakları} = 0.50 \times 0.520 = 0.260 \text{ '}$$

$$\text{Kiriş zati} = 0.23 \times 0.40 \times 2.4 = 0.221 \text{ '}$$

$$p = q = 1.141 \text{ t/m.}$$

$$\text{K11 Açıklığı Max } M_{11} = \frac{1.141 \times 4.05^2}{12.96} = 1.45 \text{ tm.}$$

$$\text{K12 Açıklığı Max } M_{12} = \frac{1.141 \times 4.05^2}{24.00} = 0.78 \text{ tm.}$$

$$\text{K11 - K12 Mesneti } X_1 = -\frac{1.141 \times 4.05^2}{9.33} = -2.01 \text{ tm.}$$

KIRIŞ DONATI HESAPLARI:

Kesit 23/40

$$K_{11} \quad \text{Açıklığı } M = 145 \text{ cm.} \quad \text{Tablalı kesit } \psi = \frac{d}{h} = \frac{12}{37} = 0.32 \quad \frac{C_b}{C_e} = \frac{50}{1400}$$

$$i_3 = 0.807 \quad i_c = 131$$

$$b = \frac{131 \times 145}{37^2} = 14 \text{ cm} < b_{\max} = 4.5 \times 12 + 23 = 77 \text{ cm.}$$

$$f_e = \frac{0.807 \times 145}{37} = 3.16 \text{ cm}^2$$

Donatı üstte 2φ10

Altta 5φ10 (3.93 cm²); (3 pilye)K12 Açıklığı:

$$f_e = \frac{0.807 \times 78}{37} = 1.70 \text{ cm}^2$$

Donatı üstte 2φ10

Altta 3φ10 (2.36 cm²); (1 pilye)K11 - K12 mesneti $x = 201 \text{ cm.}$

$$K_2 = 37 \sqrt{\frac{23}{201}} = 12.58$$

$$C_b = 44 \text{ kg/cm}^2$$

$$K_3 = 0.800$$

$$f_e = \frac{0.800 \times 201}{37} = 4.35 \text{ cm}^2$$

$$\text{Mevcut } 2\phi 10 + 4\phi 10 = 4.71 \text{ cm}^2$$

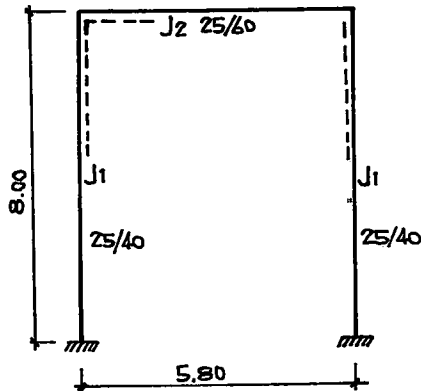
KAYMA TAHKİKİ:

$$Q_{\max} = \frac{1}{2} \times 1.141 \times 4.055 + \frac{2.01}{4.055} = 2.810 \text{ ton.}$$

$$Z = 0.893 \times 37 \approx 33 \text{ cm.}$$

$$\tau_0 = \frac{2810}{23 \times 33} = 3.70 \text{ kg/cm}^2 < \tau_{\text{em}} = 6 \text{ kg/cm}^2$$

etr φ8/25

ÇERÇEVE HESAPLARI:

J2 kiriş atalet momenti (tablalı kesit)

$$b = b_d + b_o = 6 \times 12 + 25 = 97 \text{ cm.}$$

$$\frac{d}{d_o} = \frac{12}{60} = 0.20 \quad \frac{b_o}{b} = \frac{25}{97} = 0.26 \quad \mu = 26.8$$

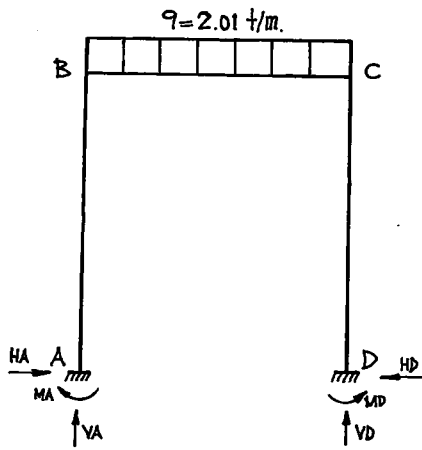
$$J_2 = \frac{9.7 \times 6.0^3}{26.8} = 78.2 \text{ dm}^4$$

$$J_1 \text{ kolon} = \frac{2.5 \times 4.0^3}{12} = 13.3 \text{ dm}^4$$

$$K = \frac{J_2}{J_1} \cdot \frac{h}{l} = \frac{78.2}{13.3} \cdot \frac{8.00}{5.80} = 8.11$$

$$N_1 = K + 2 = 8.11 + 2.00 = 10.11$$

$$N_2 = 6K + 1 = 6 \times 8.11 + 1.00 = 49.66$$

ZATI YÜK:YÜKLER:

$$\text{Döşemeden} = 2 \times 0.391 \times 0.520 \times 4.05^5 = 1.450 \text{ t/m.}$$

$$\text{Kiriş zati} = \frac{0.25 \times 0.60 \times 2.4}{2.010} = 0.360 \text{ t/m.}$$

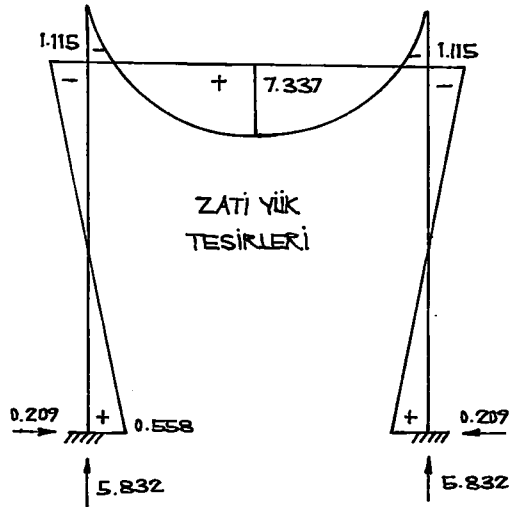
$$M_A = M_D = \frac{q l^2}{12 N_1} = \frac{2.01 \times 5.8^2}{12 \times 10.11} = 0.558 \text{ tm.}$$

$$M_B = M_C = -\frac{q l^2}{6 N_1} = -\frac{2.01 \times 5.8^2}{6 \times 10.11} = -1.115 \text{ tm.}$$

$$V_A = V_D = \frac{q l}{2} = \frac{2.01 \times 5.8}{2} = 5.832 \text{ ton.}$$

$$H_A = H_D = \frac{3 M_A}{h} = \frac{3 \times 0.558}{8.00} = 0.209 \text{ ton.}$$

$$M_{\max} = \frac{q l^2}{8} + M_B = \frac{2.01 \times 5.8^2}{8} - 1.115 = 7.337 \text{ tm.}$$

İZOLATÖRLERDEN GELEN YÜK: (HERBİR ÇERÇEVEYE P = 500 KŞ)

$$M_A = -\frac{P h}{2} \cdot \frac{1+3k}{N_2} = -\frac{0.500 \times 8.00}{2} \times \frac{1+3 \times 8.11}{49.66} = -1.020 \text{ tm.}$$

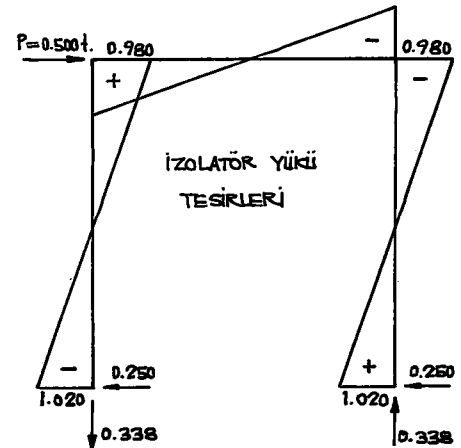
$$M_D = +1.020 \text{ tm.}$$

$$M_B = +\frac{P h}{2} \cdot \frac{3k}{N_2} = \frac{0.500 \times 8.00}{2} \times \frac{3 \times 8.11}{49.66} = +0.980 \text{ tm.}$$

$$M_C = -0.980 \text{ tm.}$$

$$V_A = -V_D = -\frac{2 M_B}{l} = -\frac{2 \times 0.980}{5.80} = -0.338 \text{ ton.}$$

$$H_A = -H_D = -\frac{P}{2} = -\frac{0.500}{2} = -0.250 \text{ ton.}$$



RÜZGÂR YÜKÜ:

$$W = C.q = 1.2 \times 50 = 60 \text{ Kg/m}^2$$

$$Q = 60 \times 4.00 = 240 \text{ Kg/m.}$$

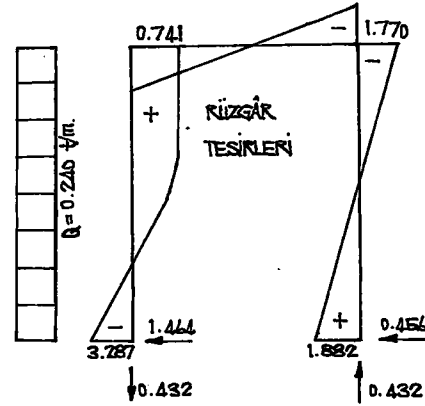
$$\begin{aligned} \text{MA} & \searrow \frac{0.240 \times 8.00^2}{4} \left(-\frac{3+8.11}{6 \times 10.11} \mp \frac{1+4 \times 8.11}{49.66} \right) \begin{cases} -3.287 \text{ tm.} \\ +1.882 \text{ tm.} \end{cases} \\ \text{MD} & \nearrow \end{aligned}$$

$$\begin{aligned} \text{MB} & \searrow \frac{0.240 \times 8.00^2}{4} \left(-\frac{8.11}{6 \times 10.11} \pm \frac{2 \times 8.11}{49.66} \right) \begin{cases} +0.741 \text{ tm.} \\ -1.770 \text{ tm.} \end{cases} \\ \text{MC} & \nearrow \end{aligned}$$

$$V_A = -V_D = -\frac{0.24 \times 8.11 \times 8.00^2}{5.80 \times 49.66} = -0.432 \text{ ton.}$$

$$H_D = \frac{0.240 \times 8.00 (3+2 \times 8.11)}{8 \times 10.11} = 0.456 \text{ ton.}$$

$$H_A = -(0.240 \times 800 - 0.456) = -1.464 \text{ ton.}$$



ZELZELE HESABI:

$$C = C_0 \Pi_1 \Pi_2$$

$$C_0 = 0.06$$

$$K_{11}-K_{12} = 4 \times \frac{1}{2} \times 1.141 \times 4.05^5 = 7.252$$

$$C = 0.06 \times 1.00 \times 1.00 = 0.06$$

$$\Pi_1 = 1.00$$

$$K_{13} = 2.01 \times 5.80 = 11.658$$

$$\Pi_2 = 1.00$$

$$\text{Kolon} = 0.25 \times 0.40 \times 2 \times 8.00 \times 2.4 = 3.840$$

Yatay deprem kuvveti

$$H = C(G + \Pi P)$$

$$G = 24.750 \text{ ton.}$$

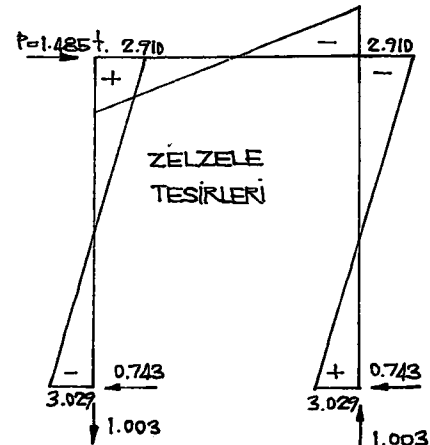
$$H = 0.06 \times (24.750 + 0) = 1.485 \text{ ton.}$$

$$\begin{aligned} \text{MA} & \searrow + \frac{1.485 \times 8.00}{2} \times \frac{1+3 \times 8.11}{49.66} = \begin{cases} -3.029 \text{ tm.} \\ +3.029 \text{ tm.} \end{cases} \\ \text{MD} & \nearrow \end{aligned}$$

$$\begin{aligned} \text{MB} & \searrow + \frac{1.485 \times 8.00}{2} \times \frac{3 \times 8.11}{49.66} = \begin{cases} +2.910 \text{ tm.} \\ -2.910 \text{ tm.} \end{cases} \\ \text{MC} & \nearrow \end{aligned}$$

$$V_A = -V_D = -\frac{2 \times 2.910}{5.80} = -1.003 \text{ ton.}$$

$$H_A = -H_D = -\frac{1.485}{2} = -0.743 \text{ ton.}$$



ÇERÇEVE KIRIŞLARI HESABI:

(Zati yük + izolatör yükü + rüzgâr)

$$K_3 \text{ açıklığı } \max M = 733.7 \text{ tcm.} \quad h = 57 \text{ cm} \quad b_0 = 25 \text{ cm.} \quad d = 12 \quad \frac{C_b}{C_e} = \frac{50}{1400}$$

$$\text{Tablalı kesit } \gamma = \frac{d}{h} = \frac{12}{57} = 0.21 \quad I_3 = 0.785 \quad i_6 = 150$$

$$b = \frac{150 \times 733.7}{57^2} = 33.9 \text{ cm.} < b_{\max} = 12 \times 12 + 25 = 169 \text{ cm.}$$

$$f_e = \frac{0.785 \times 733.7}{57} = 10.1 \text{ cm}^2$$

Donatı üstte 2 $\phi 10$ Altta 5 $\phi 16$ (3 pilye)

$$C - \text{Mesneti } x = (-111.5 - 98.0 - 177.0) = -386.5 \text{ tcm.}$$

$$k_2 = 57 \sqrt{\frac{25}{386.5}} = 14.54 \quad G_b = 36 \text{ kg/cm}^2 \quad K_3 = 0.787$$

$$f_e = \frac{0.787 \times 386.5}{57} = 5.34 \text{ cm}^2 \quad \text{üstte mevcut} = 2 \phi 10 + 3 \phi 16 (7.60 \text{ cm}^2) \text{ kafi}$$

KAYMA TAHKİKİ:

$$Q = 6.602 \text{ ton.} \quad \tau_0 = \frac{6.602}{25 \times 52} = 5.08 \text{ kg/cm}^2 < \tau_{0em} = 6 \text{ kg/cm}^2 \quad \text{etr. } \phi 8/25$$

$$Z = 0.907 \times 57 = 52$$

S₂ = KOLON HESABI:

$$\text{KOLON YÜKLERİ: } K_{n1} - K_{n2} \text{ den } = 2 \times \frac{1}{2} \times 1.141 \times 4.05^2 = 4.63 \text{ ton.}$$

$$K_{13} \text{ " } = \frac{1}{2} \times 2.01 \times 5.80 = 5.83 \text{ "}$$

$$\text{izolatörden} = 0.34 \text{ "}$$

$$\text{Rüzgârdan} = 0.43 \text{ "}$$

$$\text{Kolon zati} = 0.25 \times 0.40 \times 8.00 \times 2.4 = 1.92 \text{ "}$$

$$N = 13.15 \text{ ton.}$$

$$M_D = 0.558 + 1.020 + 1.882 = +3.460 \text{ tcm.}$$

$$M_A = -3.287 - 1.020 + 0.558 = -3.749 \text{ tcm.}$$

$$e_m = \frac{M}{N} = \frac{3.749}{13.15} = 0.28$$

$$\varepsilon = \frac{0.28}{0.40} = 0.70$$

$$\begin{aligned} K_1 &= 83.13 \\ K_6 &= 75.13 \\ G'_e &= 0.932 \\ G_e &= 1.300 \end{aligned}$$

$$u = h - \frac{1}{2}d = 36 - \frac{40}{2} = 16$$

$$M_u = N(e_m + u) = 13.15 (28 + 16) = 578.6 \text{ tcm.}$$

$$\Delta M = M_u - \frac{b_0 h^2}{K_6} = 578.6 - \frac{25 \times 36^2}{75.13} = 578.6 - 431.3 = 147.3 \text{ tcm.}$$

$$f_e = \frac{b_0 h}{K_4} + \frac{\Delta M}{c \times G_e} - \frac{N}{G_e} = \frac{25 \times 36}{83.13} + \frac{147.3}{32 \times 1.3} - \frac{13.15}{1.3} = 4.25 \text{ cm}^2$$

$$f_e' = \frac{\Delta M}{c G_e'} = \frac{147.3}{32 \times 0.932} = 4.94 \text{ cm}^2$$

$$\text{Minimum porsantaj} = 0.004 \times 25 \times 40 = 4.00 \text{ cm}^2$$

Heriki tarafa $3 \phi 16$ (6.03 cm^2)
ettir. $\phi 8/20$

Kolon Flanbaşı tahkiki:

$$\rho = \frac{hk}{b} = \frac{800}{0.25} = 32 \rightarrow w = 1.944$$

$$K_b = 144$$

$$C_s = 2400$$

$$P_{em} = \frac{K_b \cdot F_b + C_s \cdot F_e}{3w}$$

$$P_{em} = \frac{(144 \times 1000 + 2400 \times 12.06)}{3 \times 1.944} = 29.654 \text{ ton} > 13.15 \text{ ton.}$$

ZELZELE TAHKİKİ:

Zati yük tesirlerine zelzele ve yarım rüzgâr tesirleri eklenerek malzeme emniyet emniyet gerilmeleri %50 artırılarak tahkik yapılacaktır.

$$K_{13} \text{ kirişi } c \text{ mesneti } x \text{ zati} = -11.5 \text{ tcm.}$$

$$x \text{ izolatör} = -78.0 \text{ "}$$

$$x \text{ rüzgâr} = 0.5 \times 177.0 = -88.5$$

$$x \text{ deprem} = -\frac{271.0}{x_{\max} = 589 \text{ tcm.}}$$

$$C_b = 0.70 \times 1.5 = 0.105 \text{ t/cm}^2$$

$$C_e = 1.4 \times 1.5 = 2.100 \text{ t/cm}^2$$

$$\text{Mesnet azaltması } \Delta x = 5.832 \times \frac{40}{2} = 116.6 \text{ tcm.}$$

$$x' = 589.0 - 116.6 = 472.4 \text{ tcm. } F_e = \text{Mevcut demir} = 2 \phi 10 + 3 \phi 16 = 7.60 \text{ cm}^2$$

$$K_4 = \frac{b_0 h}{F_e} = \frac{25 \times 57}{7.60} = 188 \rightarrow m = 31.0 \quad K_2 = 0.891$$

$$C_e = \frac{x'}{K_2 \cdot h \cdot f_e} = \frac{472.4}{0.891 \times 57 \times 7.60} = 1.22 \text{ t/cm}^2 < 2.1 \text{ t/cm}^2$$

$$C_b = \frac{C_e}{m} = \frac{1.22}{31.0} = 0.04 \text{ t/cm}^2 < 0.105 \text{ t/cm}^2$$

$$S_2 \text{ kolonu: } \frac{C_b}{C_e} = \frac{105}{2100}$$

$$M_{\max} = 0.558 - 1.020 - 3.287 - 3.029 = -6.778 \text{ tm.}$$

$$N_{\max} = 13.15 + 1.00 = 14.15 \text{ ton.}$$

$$e = \frac{40}{2} - 4 = 16 \text{ cm}$$

$$\frac{h_f}{h} = \frac{4}{36} = 0.11$$

$$M_e = 6.778 + 14.15 \times 0.16 = 7.042 \text{ t.m.}$$

$$M_e' = 6.778 - 14.15 \times 0.16 = 4.514$$

$$\rho = \frac{M_e}{C_b \cdot b \cdot h^2} = \frac{7.042}{1050 \times 0.25 \times 0.36^2} = 0.26$$

$$\rho' = \frac{M_e'}{C_b \cdot b \cdot h^2} = \frac{4.514}{1050 \times 0.25 \times 0.36^2} = 0.13$$

$$M = M' = 0.006 \quad M = 19.5$$

$$F_e = F_e' = 0.006 \times 25 \times 40 = 6.00 \text{ cm}^2 < 6.03 \text{ cm}^2$$

$$C_e = M \cdot C_b = 19.5 \times 105 = 2047 < C_{em} = 2100 \text{ kg/cm}^2$$

TEMEL HESABI:

$$C_{zem} = 15 \text{ t/m}^2 = 1.5 \text{ kg/cm}^2$$

$$e = \frac{M}{N} = \frac{3.749}{15} = 0.25 \text{ cm.}$$

$$\text{yük} = \text{kolondan} = 13.15 \text{ ton.}$$

$$\text{Temel} = 1.85$$

$$N = 15.00 \text{ ton.}$$

$$C_{z1} = \frac{15}{1.9} + \frac{3.749}{\frac{1.9^2}{6}} = 14.12 < 15 \text{ t/m}^2$$

$$C_{z2} = \frac{15}{1.9} - \frac{3.749}{\frac{1.9^2}{6}} = 1.66 > 0$$

$$M = \frac{1}{2} \times 9.20 \times \frac{0.75^2}{3} + \frac{1}{2} \times 14.12 \times 0.75 \times 2 = 3.51 \text{ t.m.}$$

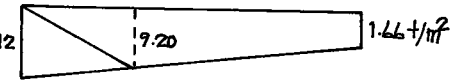
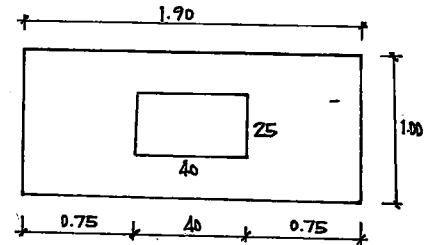
$$K_2 = 30 \sqrt{\frac{170}{351}} = 22.07 \rightarrow C_b = 22 \text{ kg/cm}^2 \quad K_3 = 0.763$$

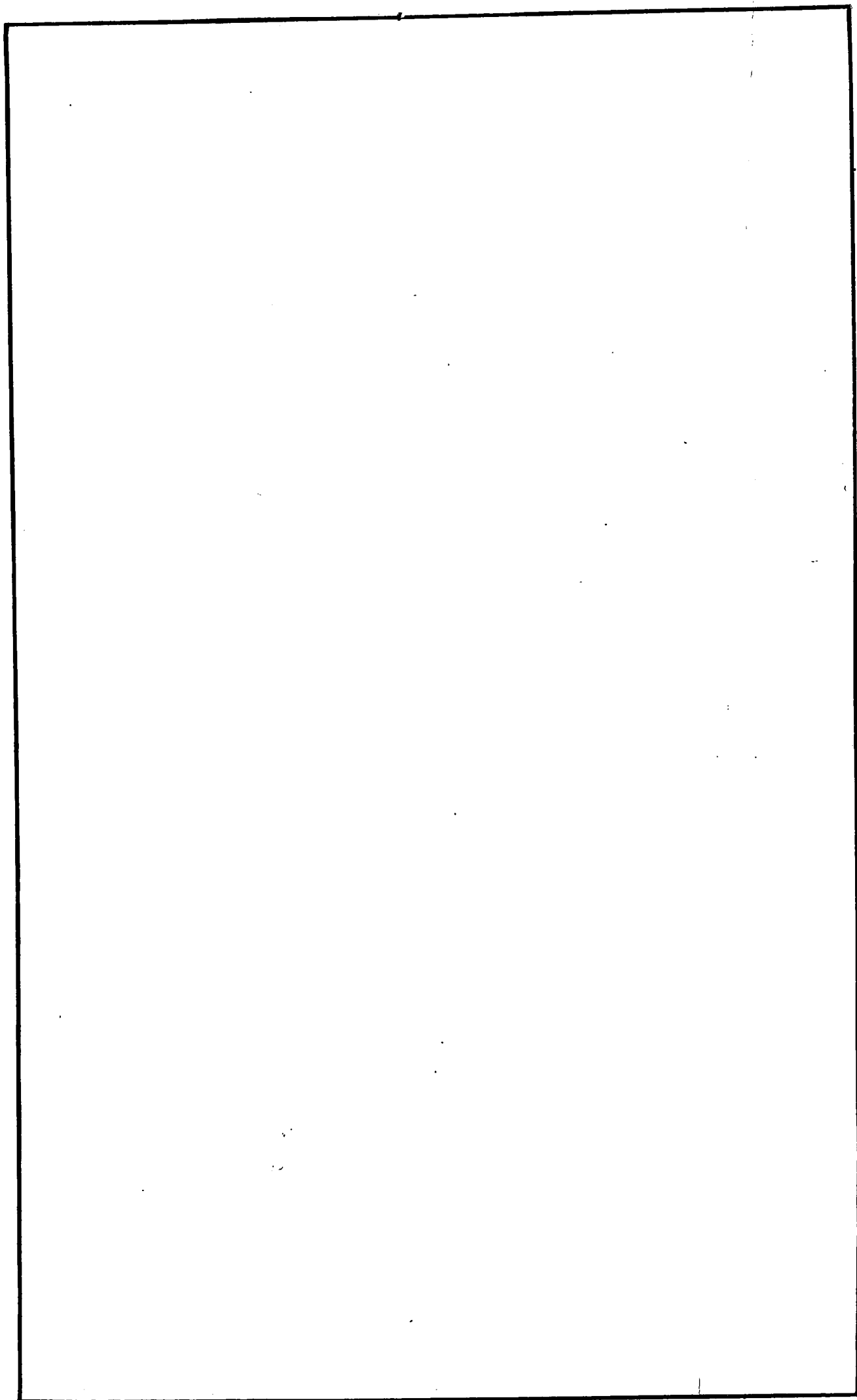
$$f_e = \frac{0.763 \times 351}{30} = 8.93 \text{ cm}^2 \text{ donatı } 12 \phi 10 (9.42 \text{ cm}^2)$$

$$\text{diğer doğrultu } M = 15 \times \frac{0.375^2}{2} = 105 \text{ t.cm.} \quad K_2 = 30 \sqrt{\frac{100}{105}} = 29.3 \quad \begin{cases} C_b = 16 \\ K_3 = 0.751 \end{cases}$$

$$f_e = \frac{0.751 \times 105}{30} = 2.63 \text{ cm}^2$$

$$\text{Donatı } 9 \phi 8$$





ENERJİ VE TABİİ KAYNAKLAR
BAKANLIĞI

İLLER BANKASI ENERJİ DAİRESİ REİSLİĞİ

İLLER BANKASI
BÖLGE MÜDÜRLÜĞÜ

YÜKLENİCİ

73
58

D E Ğ İ Ş İ K L İ K

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

Ö L Ç E K :

NOLU
PLÂN İPTÂL EDİLDİ

NOLU
PLÂN İPTÂL EDİLDİ

PROJEYİ YAPAN

İMZA

İMZA
TARİHİ

YÜK.MÜH.
HÜSEYİN BODUR
ODA NO: 343

8.10.1973

İLLER BANKASI
ENERJİ DAİRESİ
REİSLİĞİ

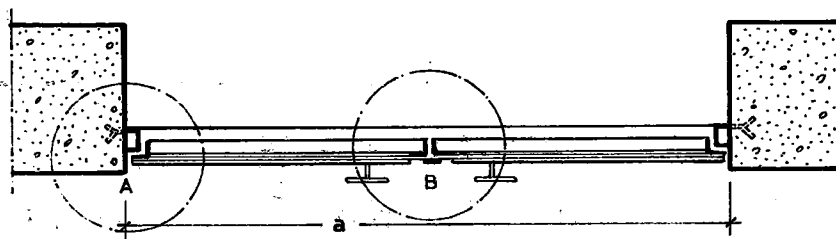
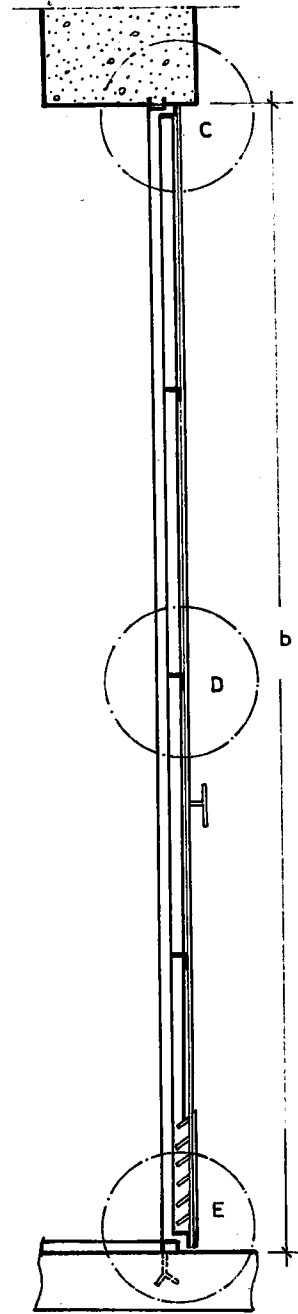
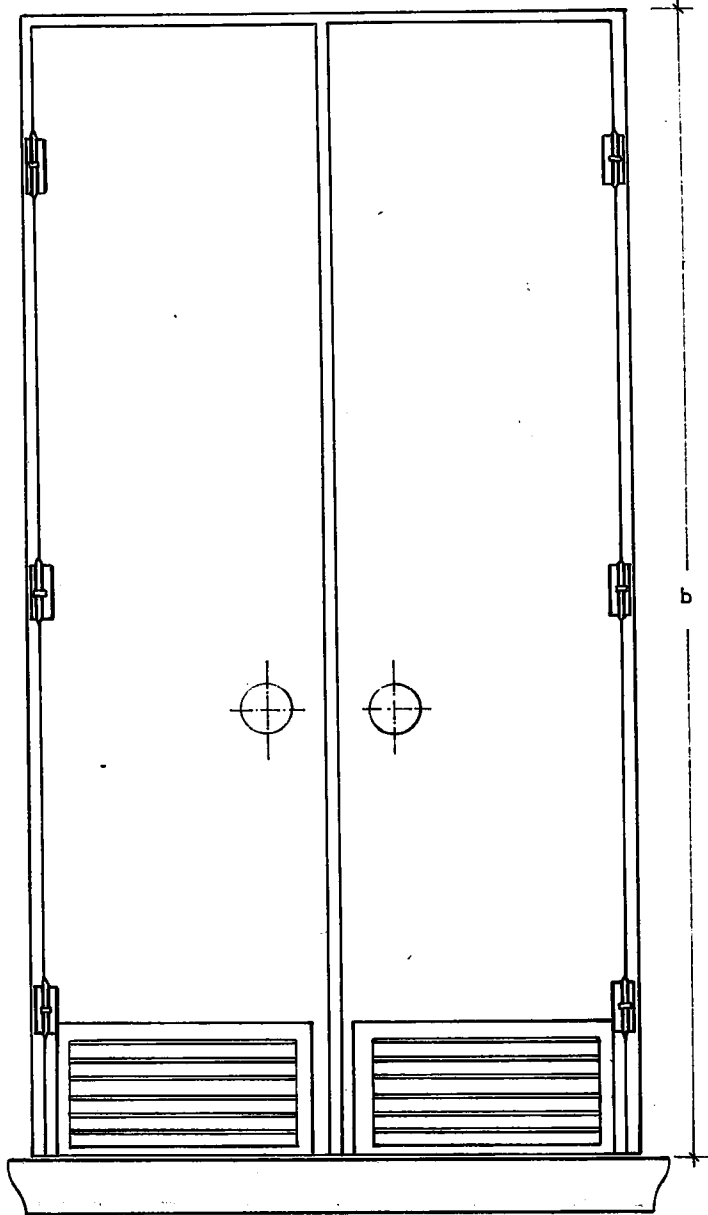
PLÂN NO:

1 / 60

ARŞİV KAYIT NO:

ÇİZEN: İLKNUR ŞENİZ

0.50 m.²

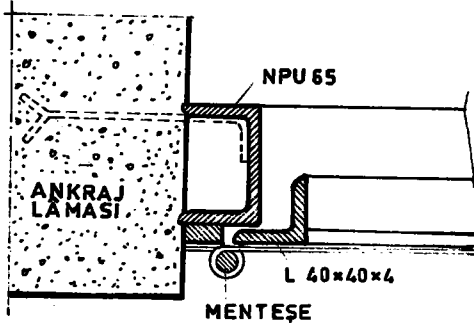


- ŞEBEKE TRAFİ MERKEZLERİNDE VE TRAFİ KAPISINDA
- ŞEBEKE TRAFİLERİNDE VE GİRİŞ KAPISINDA
- TEVZİ MERKEZLERİNDE VE GİRİŞ KAPISINDA

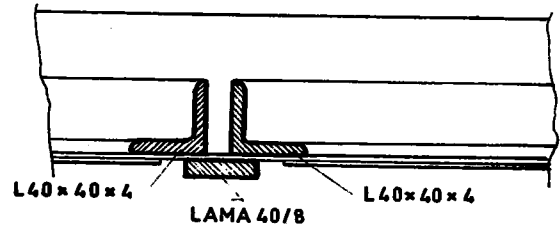
(a) cm.

(b) cm

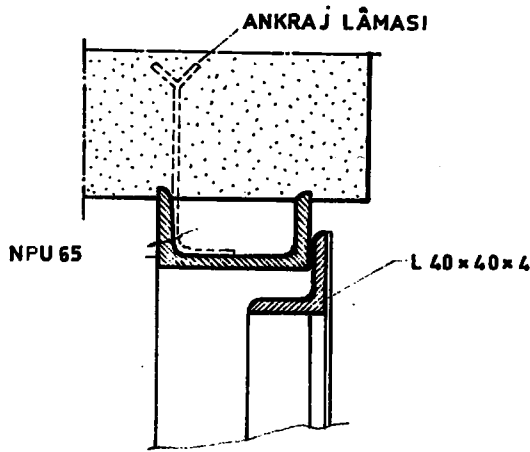
TRAFİ KAPİ PLÂNI
ÖLÇEK: 1/15



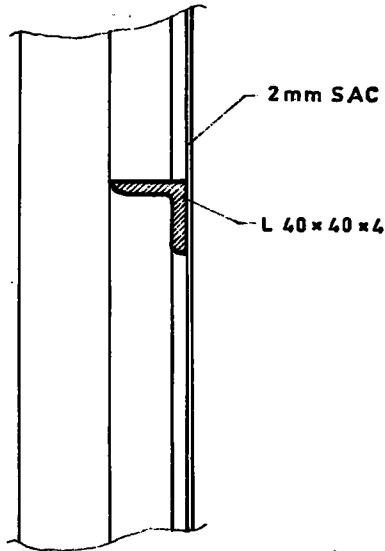
A DETAYI ÖLÇEK: 1/4



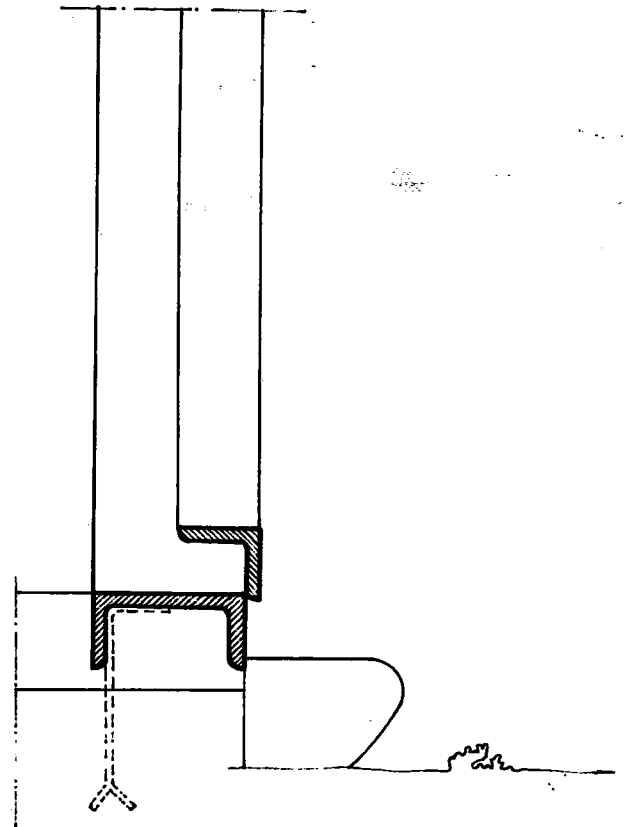
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C. DETAYI ÖLÇEK: 1/4

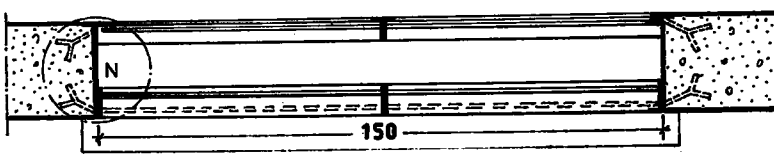
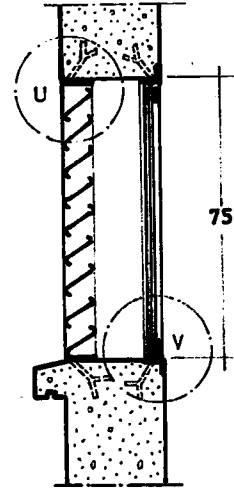
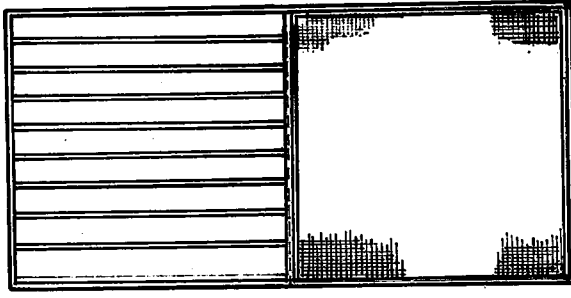


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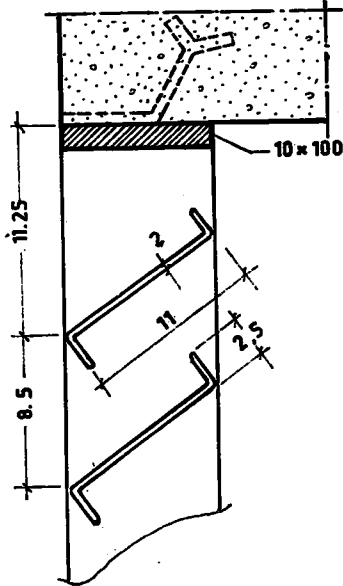
E DETAYI ÖLÇEK: 1/4

TRAFO KAPI DETAYLARI

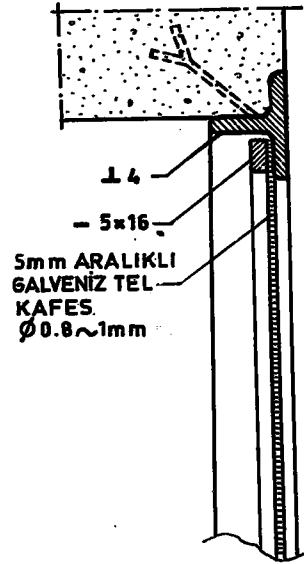


150 x 75 TRAFO PENCERE TİPİ ÖLÇEK: 1/20

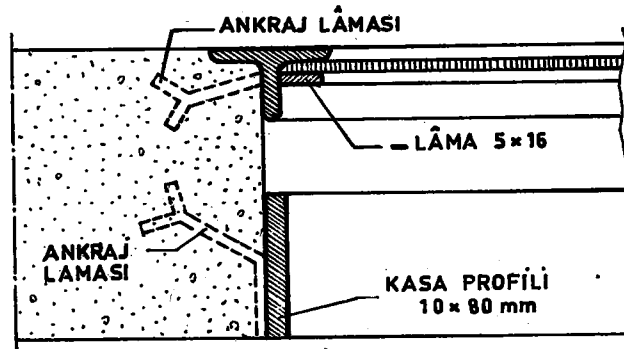
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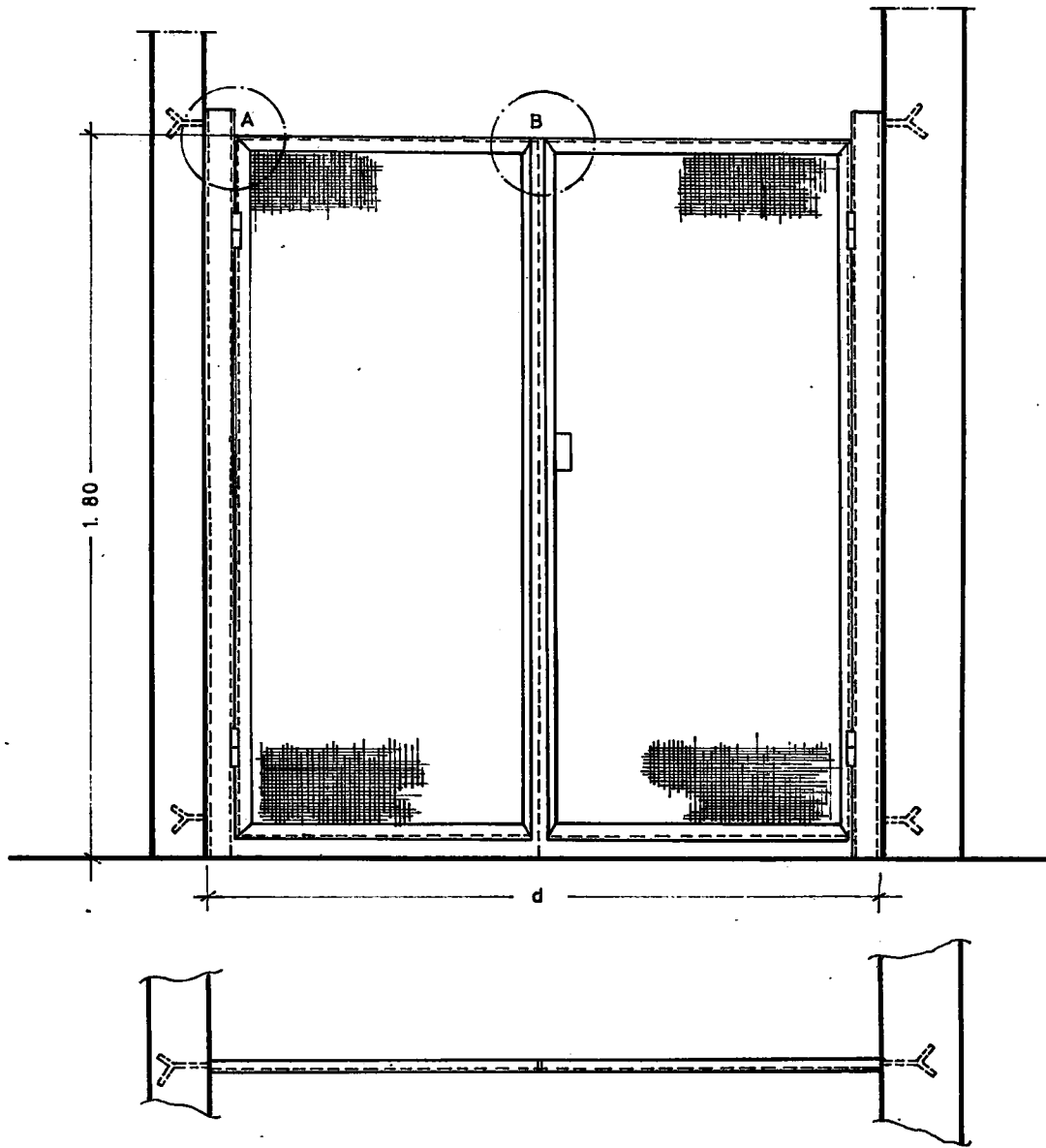
V DETAYI ÖLÇEK: 1/4



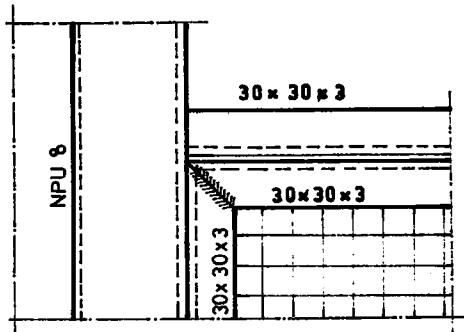
N DETAYI ÖLÇEK: 1/4



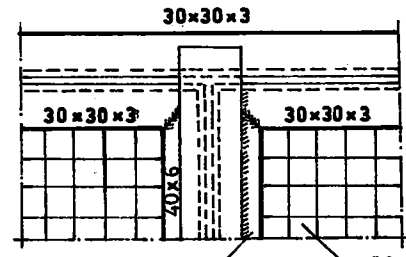
TRAFO PANCUR PLÂNI VE DETAYLARI



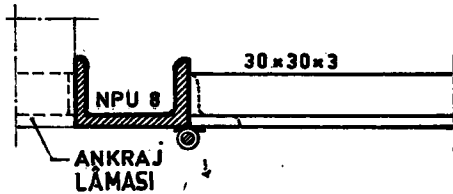
- SEBEKE TRAFOLARINDA VE	30 KV LUK HÜCRELERDE	180 İLA 187
- " "	15 KV LUK	" 120 İLA 131
- ANA TRAFÖ MERKEZLERİ VE	30 KV LUK	" cm.
- " " "	" 15 KV LUK	" cm.



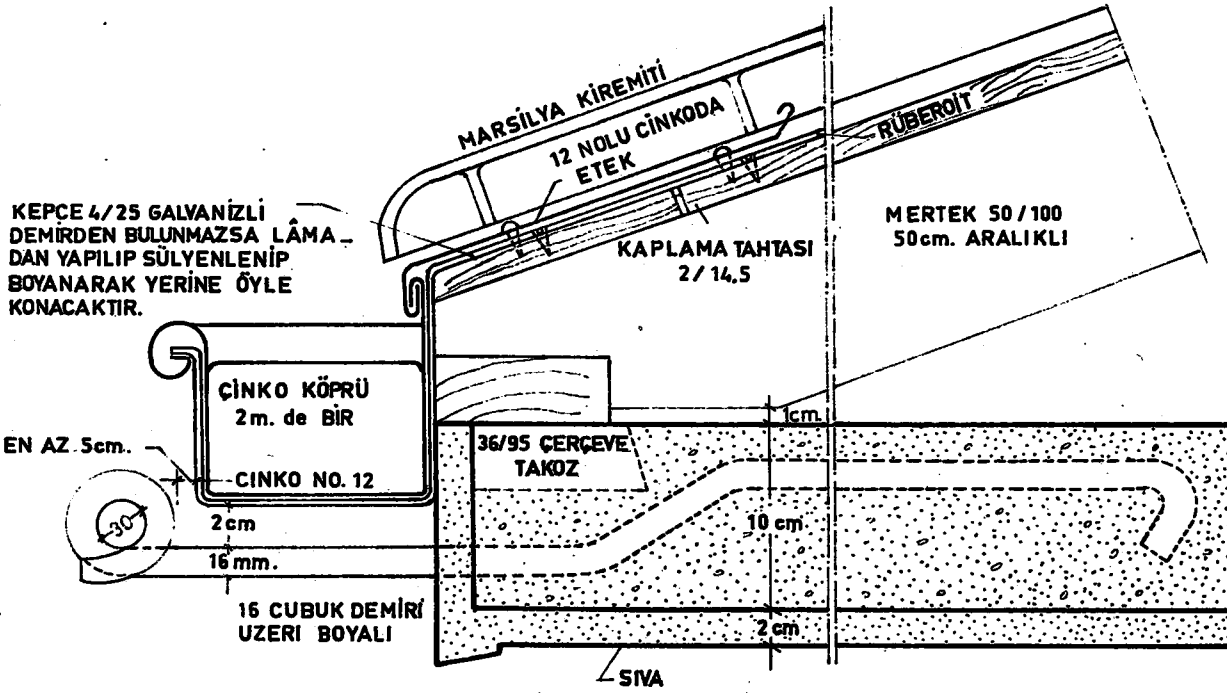
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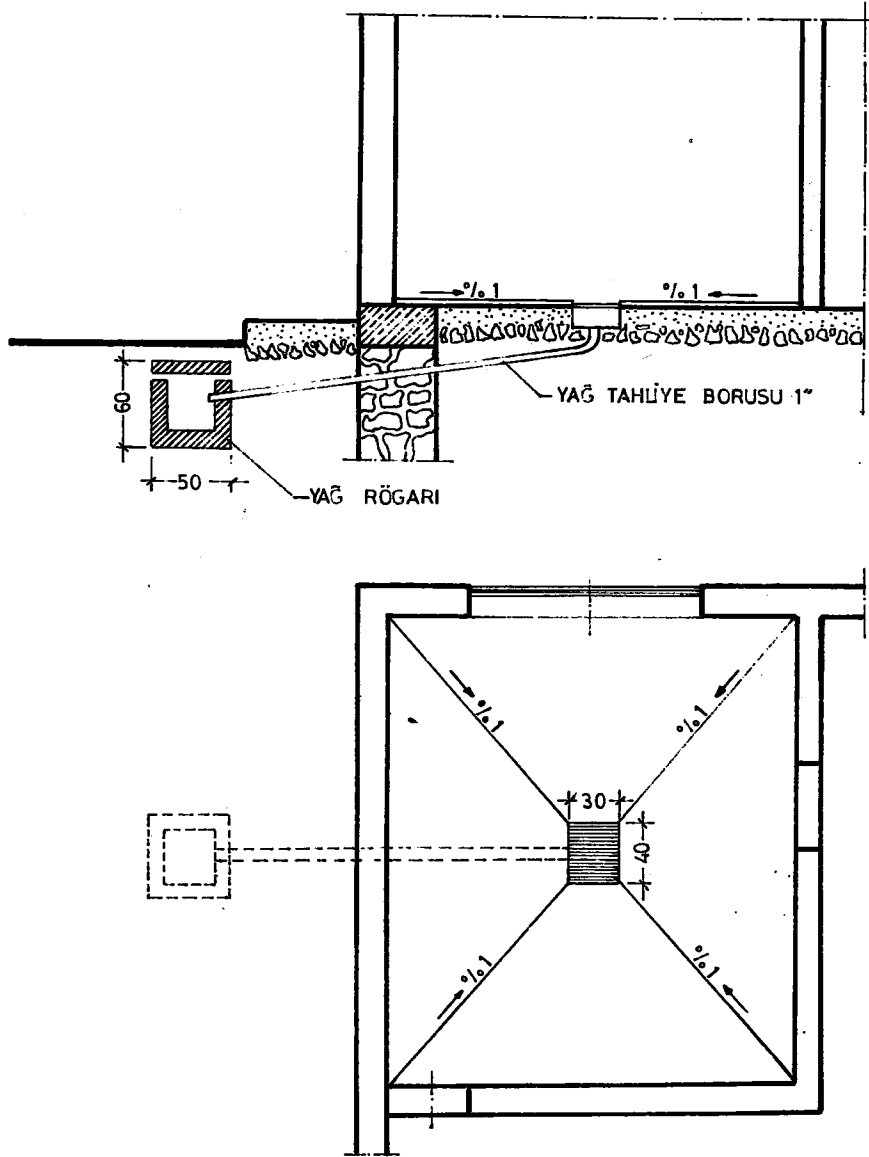
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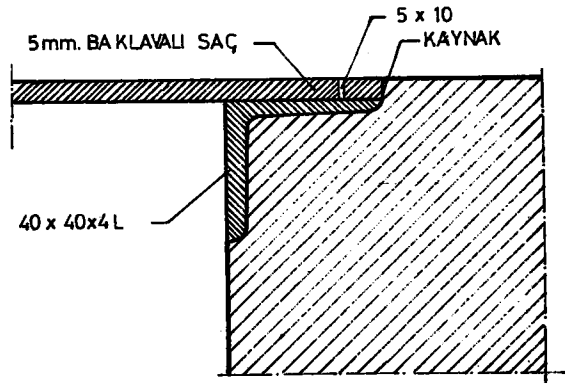
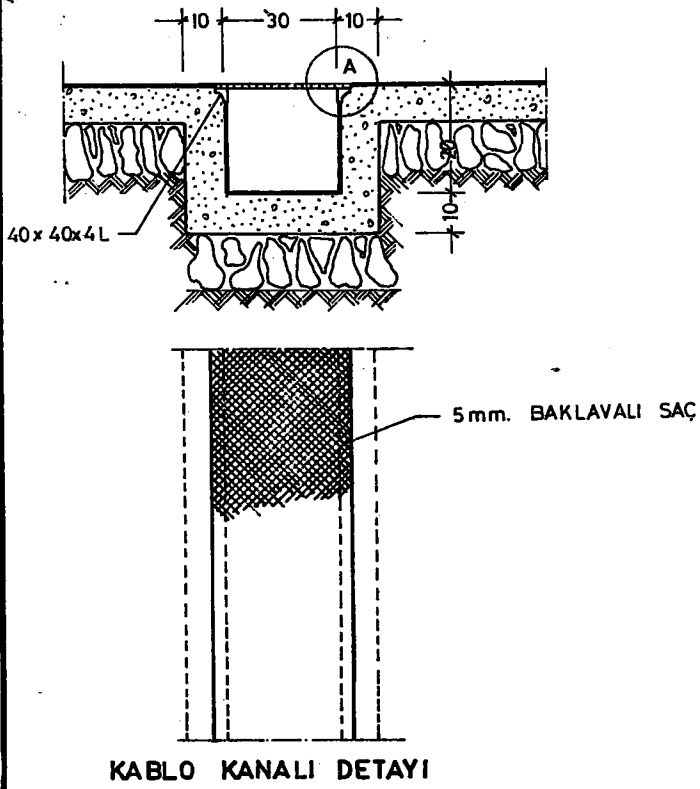
TEL KAFES KAPILAR VE DETAYLARI



ÇATI DETAYI
ÖLÇEK: 1/4

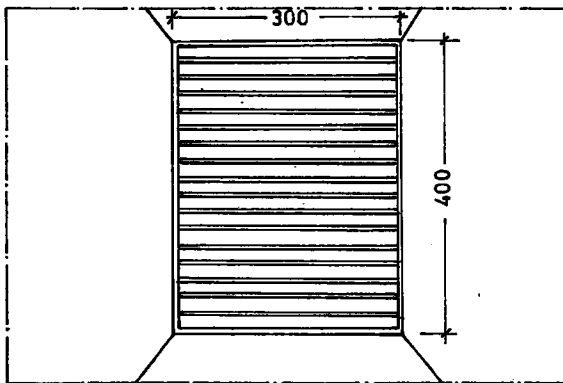
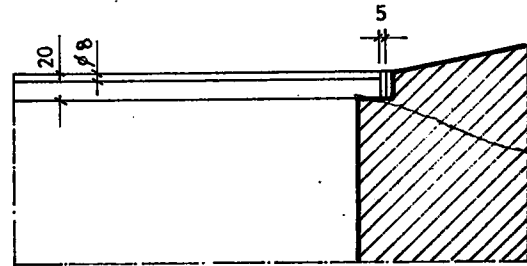
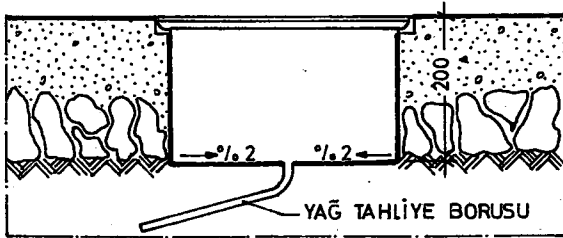


TRAFO YAĞ ÇUKURU DETAYI
ÖLÇEK:1/50

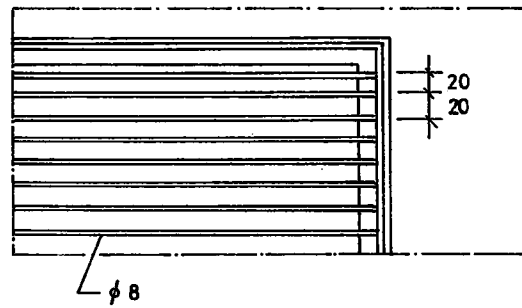


A DETAYI ÖLÇEK: 1/2,5

KABLO KANALI DETAYI



YAĞ ÇUKURU DETAYI ÖLÇEK: 1/10



IZGARA DETAYI ÖLÇEK: 1/5

YAĞ ÇUKURU DETAYI