

**INSTITUTUL POLITEHNIC "TRAIAN VUIA" TIMIȘOARA
CATEDRA DE BETON ARMAT ȘI CLĂDIRI**

Ing. Smaranda Doina NOUR

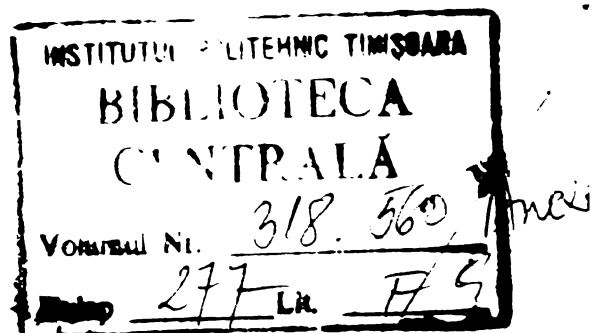
**T E Z A
D E
D O C T O R A T**

(ANEXE)

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Membru corespondent al Academiei R.S.R**

1976

BIBLIOTECA CENTRALĂ
UNIVERSITATEA "POLITEHNICA"
TIMIȘOARA



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DEVELUCRAREA STATISTICĂ A DISTANTELOR DINTRE FISURI

Tabel 1

Grupa	Distanța între fisuri în zona centrală	n (nr. fisuri)	\bar{X}	S_n	$C_v(\%)$
G1	16 16 33 16 25 10 37 21 14 20 20 23 20 16	27	21,85	9,92	0,45
	16 60 13 20 23 30 27 20 20 16 23 23 23	13	24,30	9,01	0,37
	25 53 22 15 23 30 25 20 17 20 22 22 22				
G2	28 32 40 37 26 40 32 34 12 20 34 28 40 8 16	31	27,87	1,90	0,55
	36 30 38 36 71 40 28 34 26 6 10 24 36 28 18 16	19	29,06	8,78	0,30
G3	40 20 50 26 17 22 17 30 20 20 26 22 32 10 22 26 17	35	24,05	9,57	0,35
	44 22 14 30 22 20 110 32 24 17 24 20 32 12 24 24 24	18	23,05	9,51	0,41
G4	40 13 42 4 23 21 24 14 34 18 18 26 18 32 9 27 26 20	38	18,55	6,91	0,37
	18 15 15 16 38 20 14 19 9 20 14 25 13 9 20 6 10 18 26 31	19	18,47	6,13	0,33
G5	20 16 16 20 31 18 21 8 26 19 14 26 22 14 12 30 14 22	38	20,05	7,51	0,35
	20 15 15 18 32 20 18 12 18 20 13 25 3 21 14 16 26 19 26	17	24,29	6,36	0,26
G6	22 16 13 8 16 20 22 10 16 12 6 26 18 22 17 8 20 18 24 36 19 7	46	15,65	7,24	0,46
	18 24 34 27 26 22 19 24 26 18 24 16 28 19 33 31	18	19,20	6,95	0,36
G7	19 16 12 5 17 7 4 3 3 12 16 14 13 26 8 6 19 11 18 9 11 20 11 12 28 22 12	37	20,27	7,14	0,35
	20 16 16 24 27 28 14 20 20 12 14 12 22 32 14 29 18 14	16	21,62	6,01	0,27
G8	20 15 16 18 31 29 12 22 21 18 12 16 22 34 9 30 20 14	36	20,66	7,07	0,34
	23 20 11 20 14 17 26 32 14 22 14 14 13 14 25 31 20 17 25	16	23,00	5,71	0,24
G9	18 22 24 6 12 16 27 28 28 14 30 16 16 22 30 22 14 10 18	28	24,28	9,42	0,38
	22 18 20 21 27 19 26 15 5 16 30 20 29 23 38 26 16	13	26,30	9,29	0,35
G10	19 16 24 19 23 20 27 24 14 30 19 34 24 32 27 16	44	18,09	1,02	0,38
	40 20 20 22 8 16 14 18 20 26 28 18 24 38 32	20	20,05	6,21	0,30
G11	54 27 26 16 14 25 36 23 16 22 23 34 20	51	20,68	8,04	0,35
	50 36 23 20 12 24 28 24 23 17 24 36 25	23	22,73	6,54	0,28
G12	20 26 16 20 21 27 20 21 20 26 14 16 14 20 15 22 19 13 26 12 15	58	23,37	8,84	0,37
	27 13 8 8 18 18 16 13 9 19 40 10 28 26 8 14 22 13 22 30 9 4 18	27	25,40	8,10	0,31
G13	26 22 12 20 30 22 20 21 37 27 22 10 20 20 13 23 20 17 6 18	37	12,64	5,31	0,41
	26 15 5 9 19 19 16 20 10 30 16 27 18 34 17 26 26 27 11 22 31 17 19 24 27	16	14,93	5,15	0,34
G14	14 5 11 15 19 10 12 24 9 10 14 18 10 6 5 6 17 9 18 6	47	25,55	3,195	1,25
	12 13 14 10 18 20 8 8 14 12 10 10 5 14 14 28 14				
G15	15 17 16 19 16 21 8 9 13 20 12 6 12 16 27 12	21	18,28	12,91	0,70
	12 38 24 40 16 36 35 35 17 14 26 12 20 14 8 22 23 24 20 16 16 24 58 40				
G16	14 12 29 26 33 28 28 30 44 14 32 25 31 25 27 8 18 24 30 33 43 32 20	12	12,91	38,80	0,53
	31 11 4 6 11 21 24 7 13 13 4 3 4 22 4 2 6 30 30 33 46 17	5	87,60	29,89	0,34
G17	57 12 85 69 4 13 8 73 63 96 58 136 84				
	58 100 64 140 76				

Tabel 1 continuare

GRINDA	Distanța dintre fisuri în zona centrală	n(nr fisuri)	\bar{x}	s_x	$C_v(x)$
R ₄ A	11.10.10.7.9.4.2.9.12.16.13.6.8.6.4.6.4.10.4.8.10.7.8.10.7.6.11.10.6.	51	8,17	3,38	0,41
	12.6.10.5.6.14.5.8.3.8.6.4.7.8.15.10.6.5.4.4.10.10.15.13.12	19	10,57	3,08	0,29
	10.8.13.7.14.11.11.17.9.14.10.5.5.8.11.10.14.13.11				
R ₄ B	6.14.4.9.7.12.13.14.15.11.8.11.4.8.11.8.11.6.11.13.12	44	9,40	3,37	0,35
	8.8.4.3.8.7.3.13.14.17.11.14.8.10.9.11.8.9.6.6.7.12.10 15.14.5.13.13.15.13.12.7.10.10.12.8.12.7.10.13.10.	18	11,05	2,80	0,25
R ₄ A	6.8.11.7.5.5.7.5.7.9.11.7.9.15.13.9.5.18.6.8.	39	8,89	3,53	0,39
	7.8.9.4.6.4.10.4.11.7.12.7.13.14.15.12.13.14. 6.8.13.6.5.3.7.10.6.9.9.9.8.14.13.14.16.9.12.	18	9,58	3,34	0,35
R ₄ B	12.7.10.14.6.9.12.9.5.9.7.15.11.5.9.10.8.5.6.12.	39	9,30	3,44	0,36
	7.6.8.11.8.6.10.12.6.10.8.10.16.5.4.9.19.16.12. 9.6.9.15.7.8.13.8.6.8.9.15.9.5.8.18.15.12	18	10,00	2,64	0,26
R ₄ A	11.15.12.10.10.4.7.8.5.4.9.4.10.4.13.6.9.14.12.10.11.	44	9,52	3,26	0,33
	8.5.11.14.4.10.10.8.15.11.11.6.7.6.6.9.7.7.9.6.3.11.3. 11.14.13.12.12.7.14.12.11.5.13.6.9.15.14.6.13.	17	10,88	2,98	0,27
R ₄ B	18.10.3.6.6.8.6.10.8.10.3.12.15.8.12.5.5	30	10,70	6,74	0,53
	15.17.12.10.9.9.3.4.0.15.14.10.12.10 16.16.12.9.11.11.11.15.14.10.12.10	12	12,25	2,31	0,18
R ₄ A	8.3.9.5.8.7.7.10.7.12.7.7.4.10.9.3.5.5.6.8.8.7.8.3.5	48	7,25	2,38	0,32
	6.8.8.7.7.12.9.4.10.5.7.7.7.10.5.9.12.5.3.10.11.6.9. 6.17.8.7.9.9.6.13.7.7.4.10.7.5.14.8.8.15.4.7.	20	8,55	3,49	0,40
R ₄ B	7.12.21.6.5.8.7.13.6.8.8.4.8.5.7.9.14.12.9.6.	41	8,51	3,47	0,40
	7.7.6.13.9.6.6.8.6.16.6.6.6.6.6.8.15.11.10.9 7.9.20.9.5.7.7.14.12.10.4.8.6.6.9.14.11.9.9.	19	9,26	3,66	0,39
G12-6 (4φ25) PC90	26.22.11.14.5.11.7.5.14.5.11.18.5.14.5.27.5.7.5.7.5.18.5.26.14.7.5. 7.5.7.5.7.5.11.11.13.9.9.11.9.3.5.3.5.9.14.5.7.5.11.5.5.11.22.7.5 5.5.5.5.13.11.3.5.7.5.11.7.5.11.5.5.9.11.5.5.7.5.11.24.11.9.11.11.26 14.5.14.5.11.18.5.3.5.7.5.13.5.5.11.9.26.18.5.26.	72	11,74	6,15	0,52
G18-12- -6 (9φ25) PC90	18.5.15.5.15.5.12.5.24.5.18.5.15.5.31.9.12.5.9.9.6.12.5.6.9.12.5. 9.18.5.6.6.9.9.12.5.12.5.15.5.12.5.12.5.9.18.5.9.18.5.6.6. 9.9.9.12.5.21.5.12.5.15.5.12.5.6.15.5.9.6.6.6.12.5.9.12.5. 9.12.5.12.5.12.5.18.5.9.18.5.18.5.12.5.6.18.5.3.31.12.5.12.5.15.5. 3.3.18.5.21.5.18.5.12.5.12.5.6.9.15.5.9.12.5.6.9.6.9.6.6.9.9. 12.5.6.12.5.21.5.21.5.18.5.18.5.15.5.12.5.12.5.24.5.18.5.18.5.24.5	101	12,65	5,66	0,44
	17.5.10.8.15.12.21.20.30.31.15.20.35.28.19.15.27.31.30.25.19.8.7.15.20. 15.20.4.3.15.30.40.20.22.5.25.20.24.20.10.19.15.13.20.20.20.10.15.10.25.10. 17.10.15.10.5.30.5.12.15.20.30.28.30.10.5.40 20.20.21.28.20.27.34.20.20.35.22.26.9.25.32.25.37.30 25.10.17.25.30.27.20.40.	67	19,25	0,77	0,45
G9.12 TBR ₂	15.12.28.24.13.12.6.18.8.18.12.14.4.16.14.14.10.8.10.6.8.10 5.9.16.10.14.10.14.14.19.4.8.20.10.5.16.11.14.18.18. 11.20.10.10.16.20.9.11.18.15.17.14.5.24.9.10.6.8.15.10.8.9. 11.14.14.16.19.20.10.12.16.13.14.24.8.22.15. 12.18.24.16.17.12.8.18.12.18.12.10.22.12.16.10.10.12.11.7.10.14	78	13,07	5,12	0,39
	12.22.18.12.14.16.18.12.22.7.18.16	35	14,17	4,44	0,31

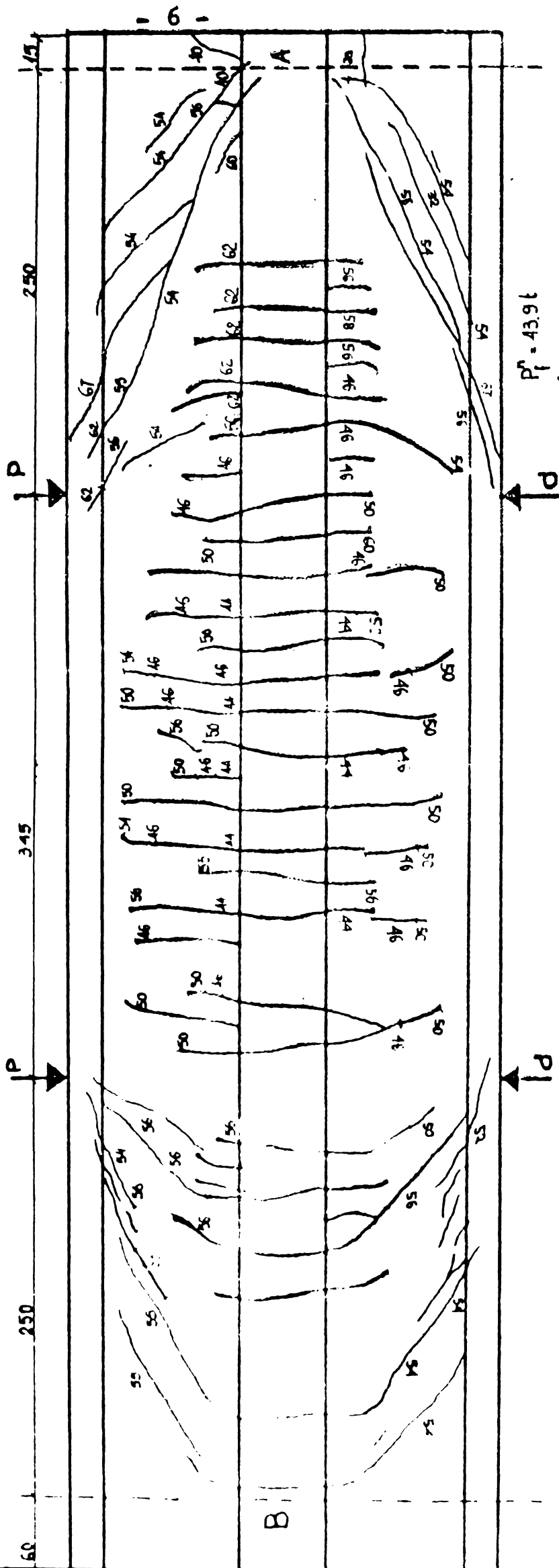
GRINZI EXPERIMENTATE LA INCERC Bucuresti

Tabel 2

Grinda G	Nr. și distanța dintre fisuri	n (nr. fisuri)	\bar{x}	s_x	$Cv(x)$
3	1x10+2x14+1x22+3x26	7	19,71	6,36	0,32
4	1x14+2x18+3x22+1x30+1x38	8	29,50	9,65	0,32
7	1x10+1x18+1x26+1x30	4	21,00	7,68	0,36
8	3x14+1x18+1x22+1x26	6	18,00	4,61	0,25
10	3x14+2x26	5	18,80	5,87	0,31
16	2x18+2x22+1x26+1x34	6	23,30	5,49	0,23
17	1x18+2x22+1x26+2x30+1x34	7	26,00	5,23	0,20
18	1x18+1x22+1x26	3	22,00	3,26	0,14
19	2x22+2x26+1x30	5	25,20	2,99	0,11
20	2x18+1x22+1x30+1x38	5	25,20	7,75	0,30
22	2x18+1x26+1x30+1x34	5	25,20	6,40	0,25
29	1x10+2x18+1x22	4	17,00	4,35	0,25
30	1x10+4x18+1x22+1x34	7	19,71	6,71	0,34
31	2x6+1x10+2x14+1x18+3x22+2x26	11	16,90	7,05	0,41
35	2x18+2x22+1x26+2x30	7	23,71	4,71	0,19
38	1x6+2x10+1x14+3x18+1x22	8	14,50	5,07	0,34
39	2x14+1x18+4x22+2x26	9	20,66	4,21	0,20
40	1x6+1x10+3x14+1x18+2x22+1x34	9	17,11	7,72	0,45
41	2x14+2x18+4x26+1x30	9	22,00	5,65	0,25
42	2x6+1x10+1x14+1x18+2x26	7	15,14	7,91	0,52
43	2x6+4x10+3x14+1x18+1x22	11	12,18	4,62	0,37
45	2x10+4x14+1x18	7	13,42	2,55	0,19
46	2x6+5x10+3x14	10	10,40	2,80	0,26
47	2x6+2x10+6x14+3x18+1x22	14	13,71	4,39	0,32
48	3x10+1x14+2x18+1x22	7	14,57	4,49	0,30
49	1x10+3x14+1x18+4x22+1x26	10	18,40	4,88	0,26
50	3x10+3x14+2x18+1x22	9	14,40	3,97	0,27
51	1x6+4x10+6x14+5x18+1x22+1x26	18	14,88	4,72	0,31
52	1x6+2x10+2x18	5	12,40	4,80	0,38
53	2x14+1x18+1x22+4x26+1x30	9	22,44	5,47	0,24
54	1x6+1x10+2x14+2x18+1x22	7	14,57	4,98	0,34
55	1x6+4x10+2x14+3x18+1x26	11	14	5,39	0,38
56	3x10+6x14+5x18+2x22+1x30	17	16,35	4,95	0,30
57	1x6+11x10+7x14+4x18	23	12,43	3,28	0,26
58	1x6+10x10+7x14+2x18+1x22	21	12,47	3,59	0,28
59	1x10+3x14+5x18+2x22	11	16,90	3,44	0,20
61	1x6+9x10+6x14+8x18	23	13,55	3,71	0,27
63	2x6+3x10+4x14+2x18+2x22	13	13,69	5,07	0,37
64	1x14+4x18+2x22+1x26+3x30	11	22,36	5,51	0,24
65	2x10+2x14+7x18+2x26+1x30	14	18,28	5,54	0,30
66	1x6+2x14+1x18+6x22+1x26+1x30	11	19,14	5,93	0,30
67	2x6+6x10+6x14+4x18+2x22	20	13,60	4,54	0,33
68	4x10+6x14+5x18+4x22+1x26	20	16,40	4,63	0,28

Obs S-a păstrat denumirea convențională a grinzilor dată de INCERC Bucuresti
Distanțele dintre fisuri s. clasate în intervale de variație

G1

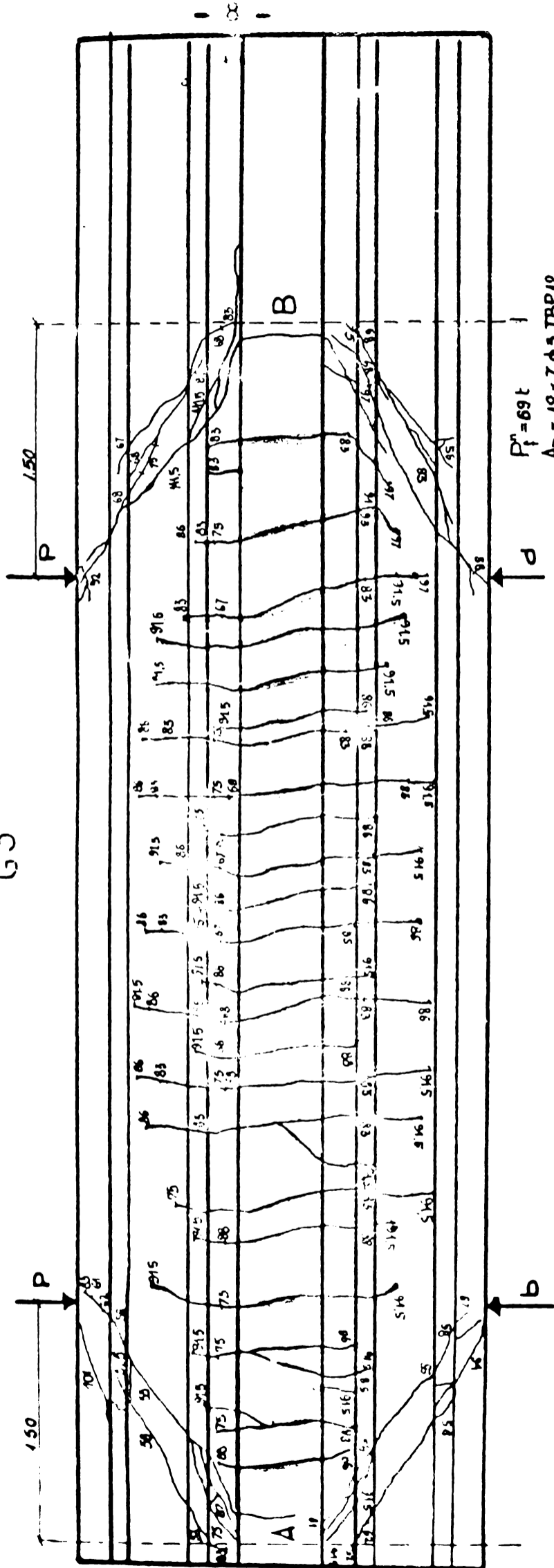


$P_1 = 43.9t$
 $A_p = 24 \times 7 \phi 3 \text{ TBP9}$
 $A_{ac} = 5 \phi 8 / m \text{ OB38}$

A. I. I.

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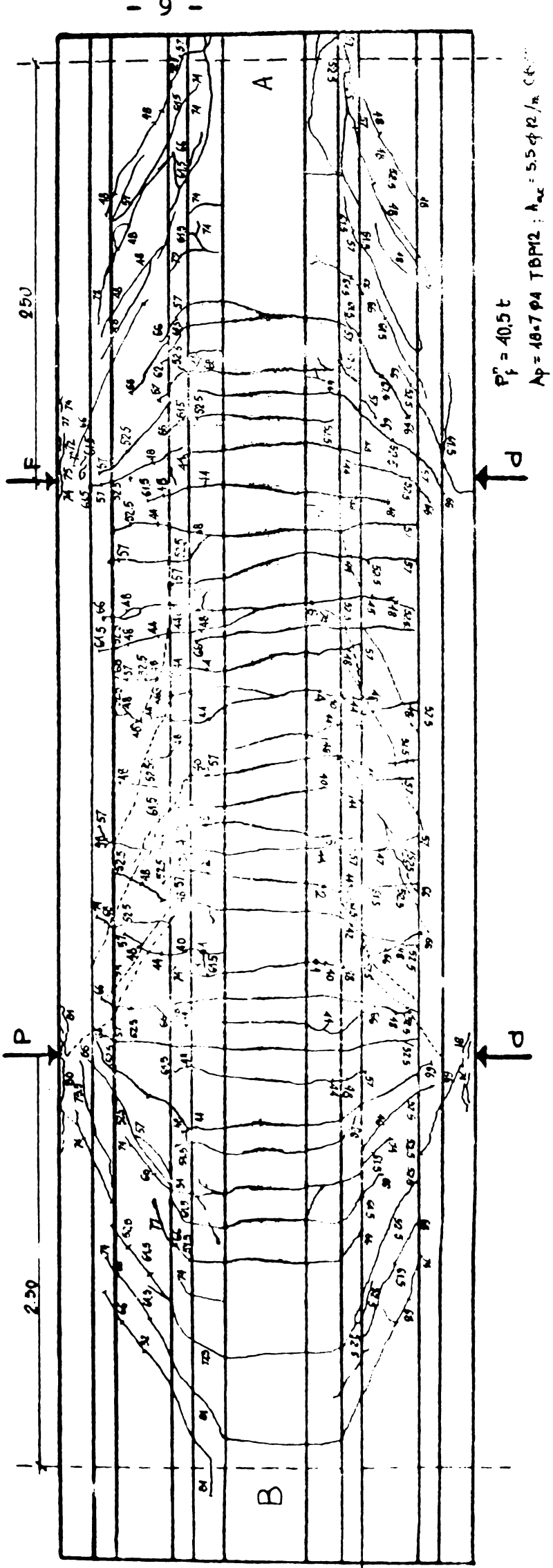
G3



$P_f = 69t$
 $A_p = 18 \times 7 \phi 5 \text{ TBP12}$
 $A_{AE} = 4,5 \phi 8/m \text{ OB.38}$

A. I. 3

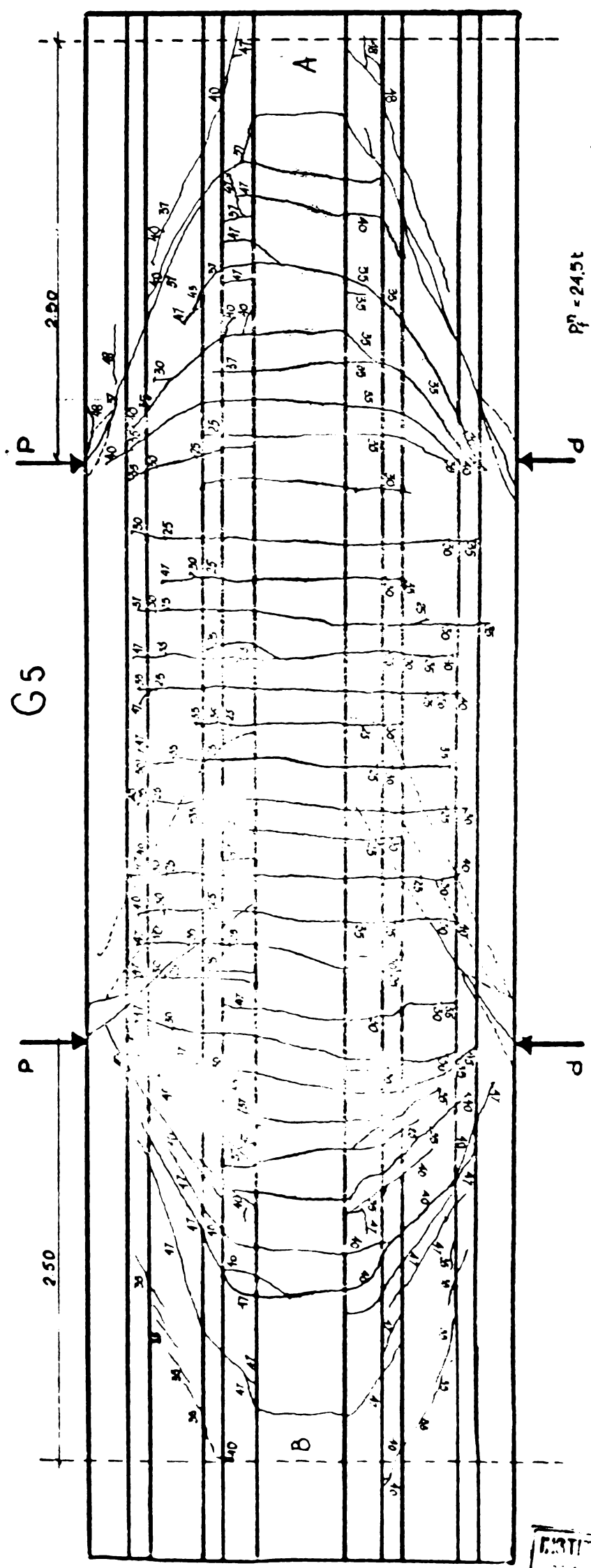
G4



$P_f = 40,5 \text{ t}$
 $A_p = 18-7 \text{ PA TBP12} ; A_{acc} = 5,5 \text{ cm}^2/\text{m}$

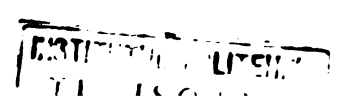
A. I. 4.

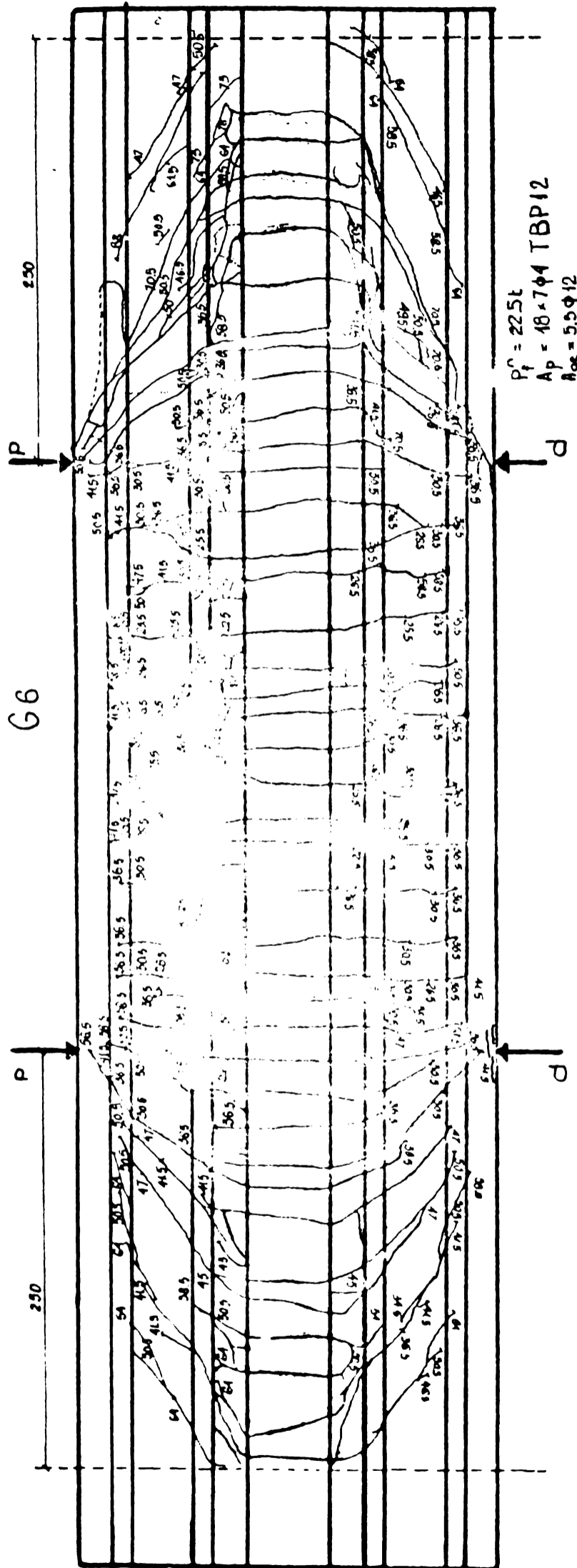
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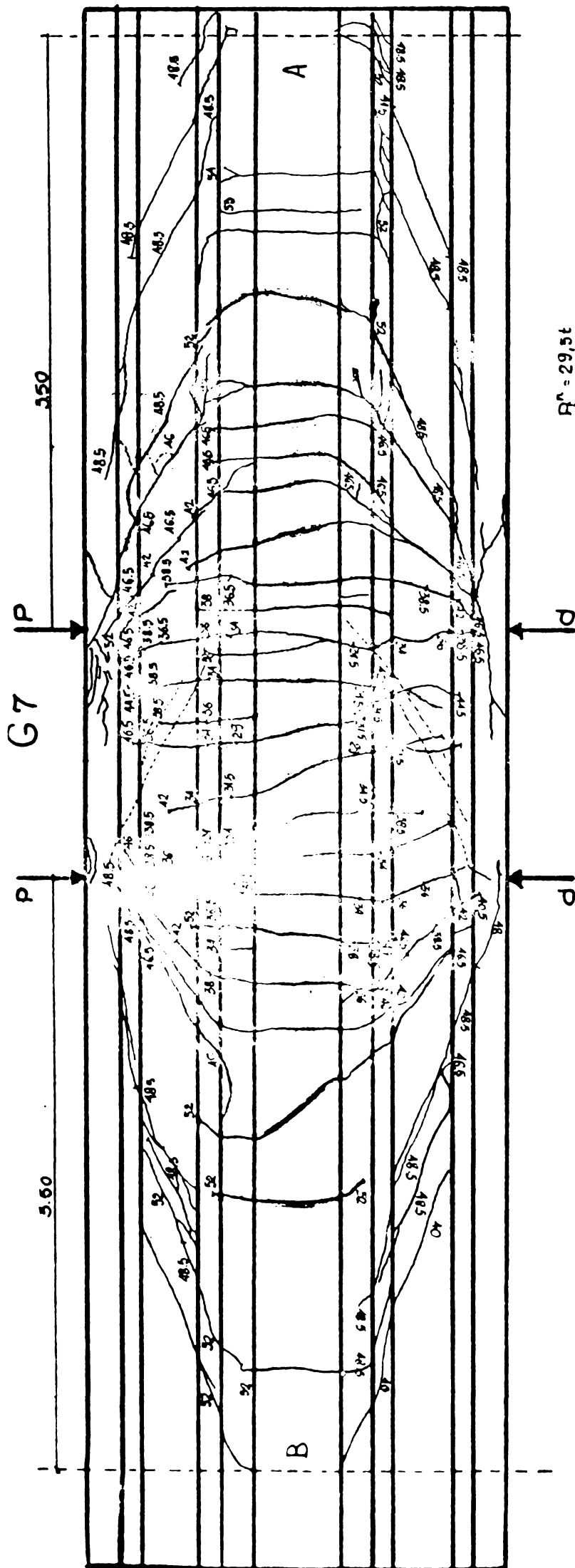
$P_f = 24.5t$
 $A_b = 18 \times 7 \phi 1$ TBP12 ; $A_{oe} = 45 \phi 8$

A. I. 5.



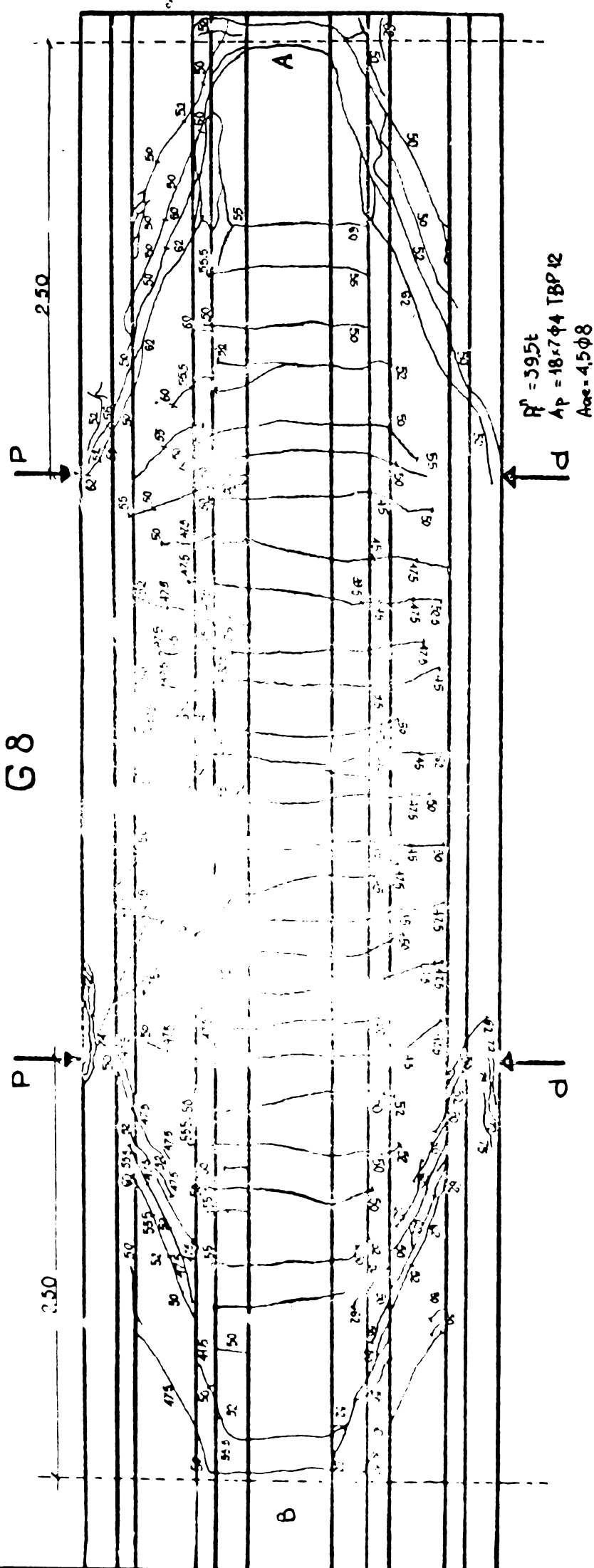


A. I. 6.



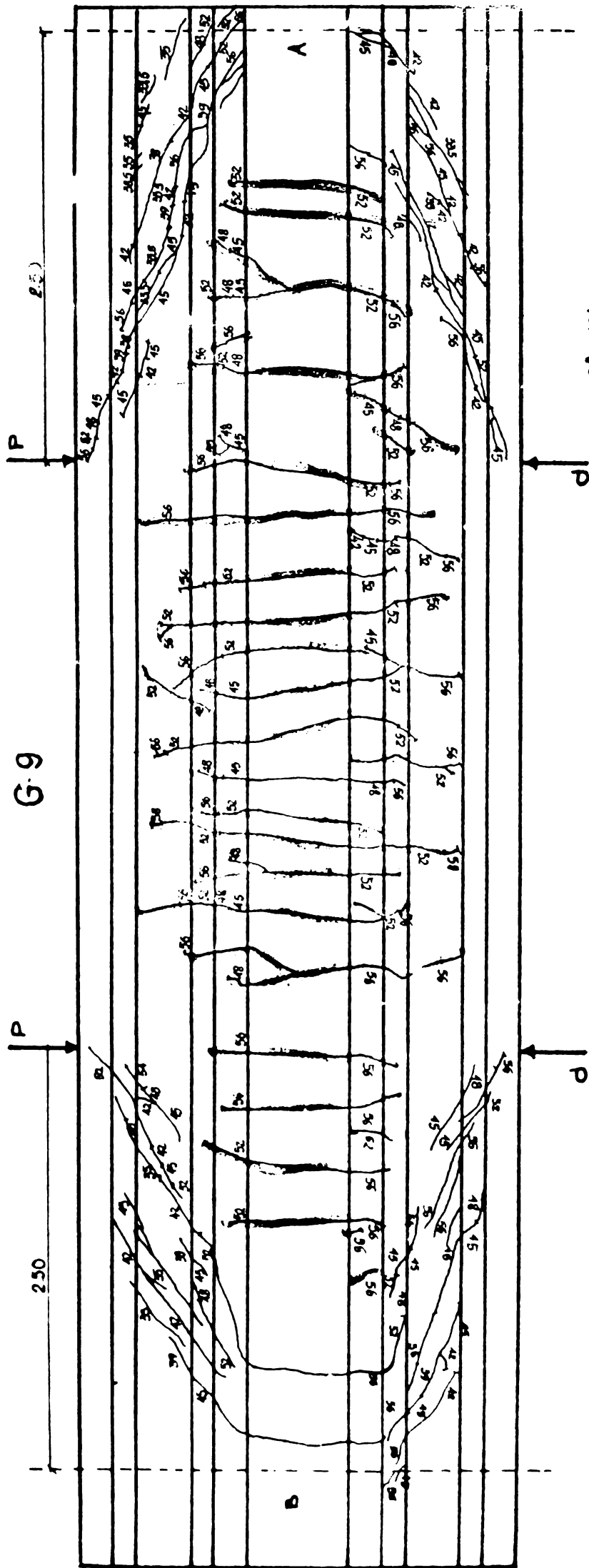
$R^m = 29,5t$
 $A_p = 10 \cdot 7 \phi 1$ TBP 42
 $A_{acc} = 4,5 \phi 8$

A. I. 7.



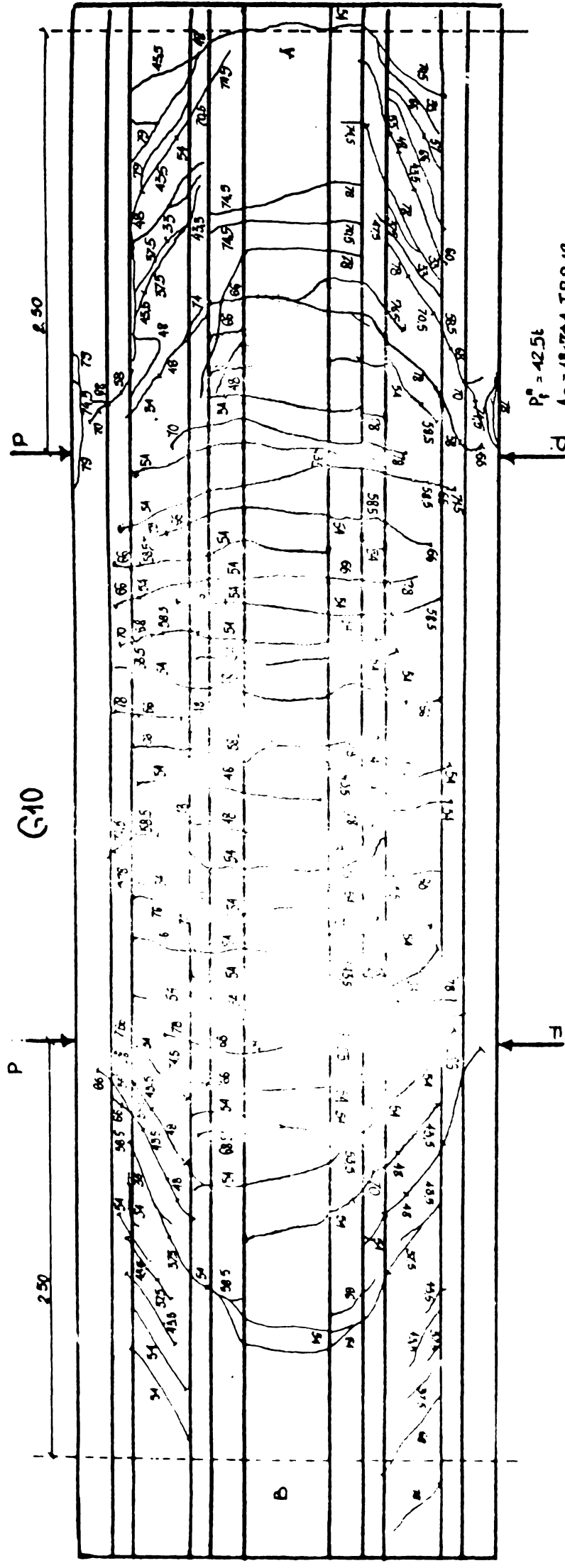
A. I. 8.

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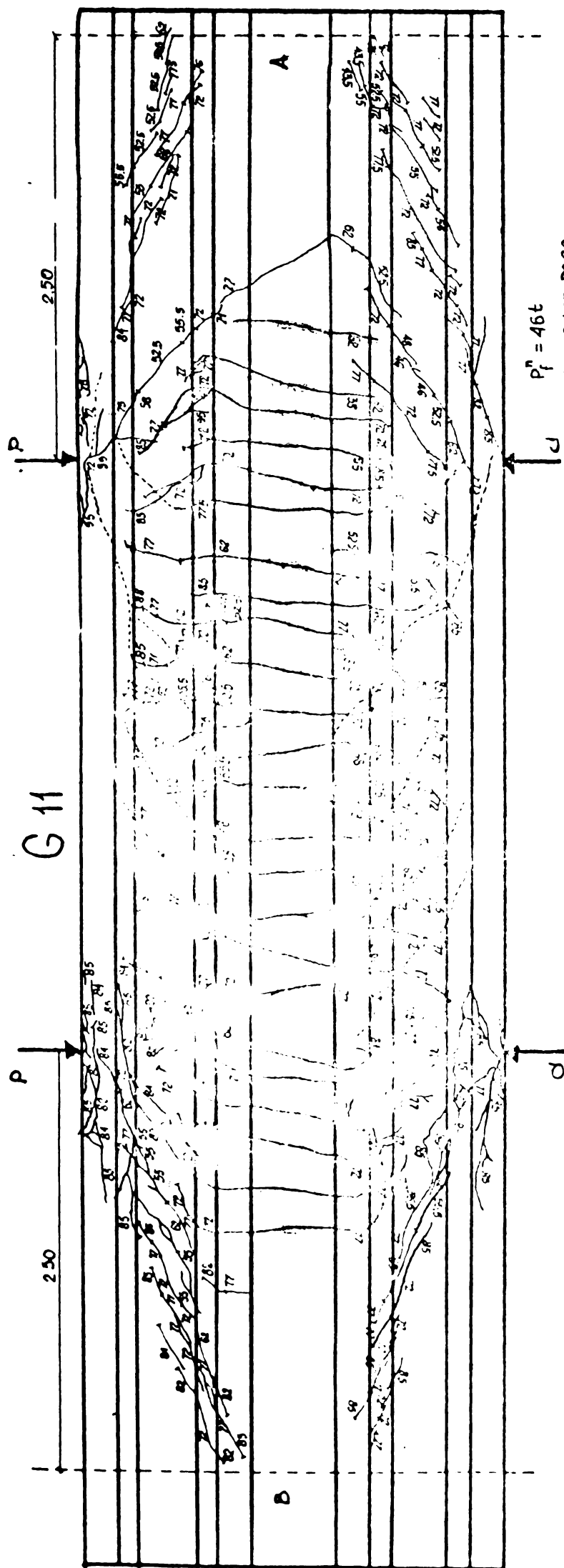
$P_1^0 = 12t$
 $A_p = 48.704 \text{ TBP}12$
 $A_{oc} = 4.528/m \text{ 0638}$

A. I. 9.

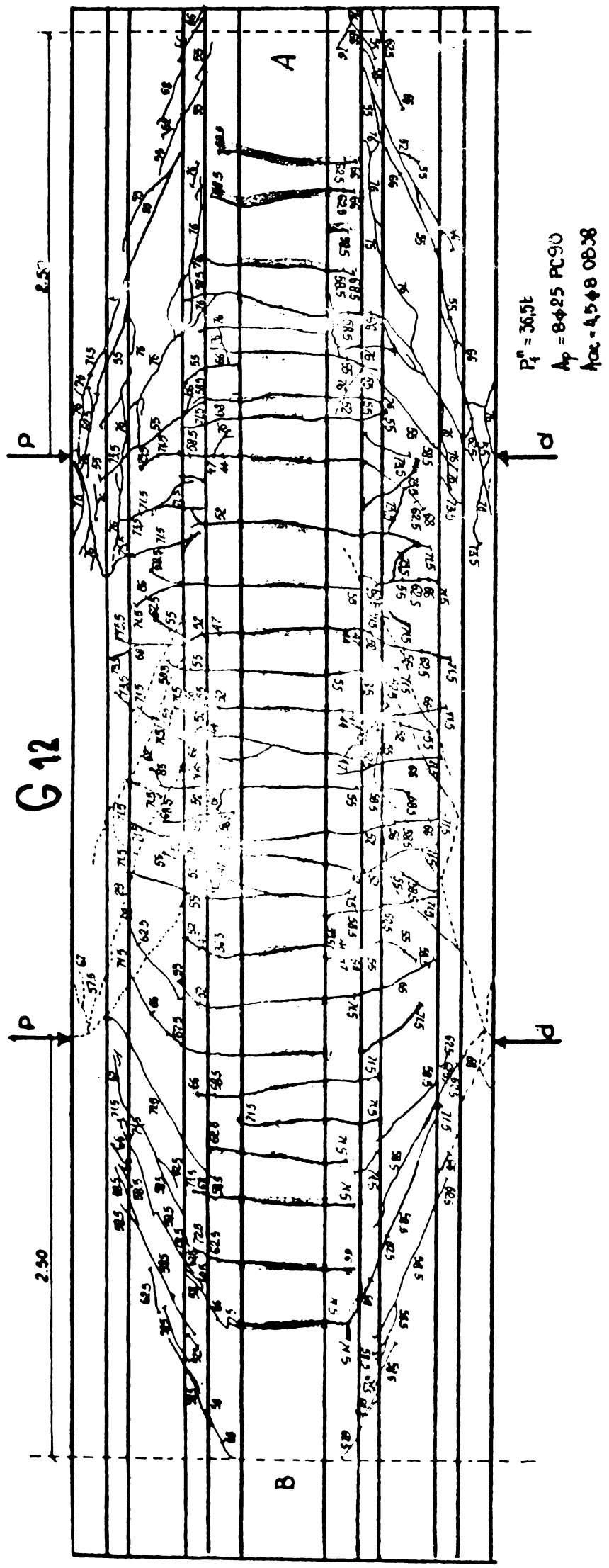


$P_f^0 = 42.5t$
 $AP = 18.7\phi 4 \text{ TBP } 12$
 $A_{sc} = 5.5 \phi 12/m \text{ OB } 30$

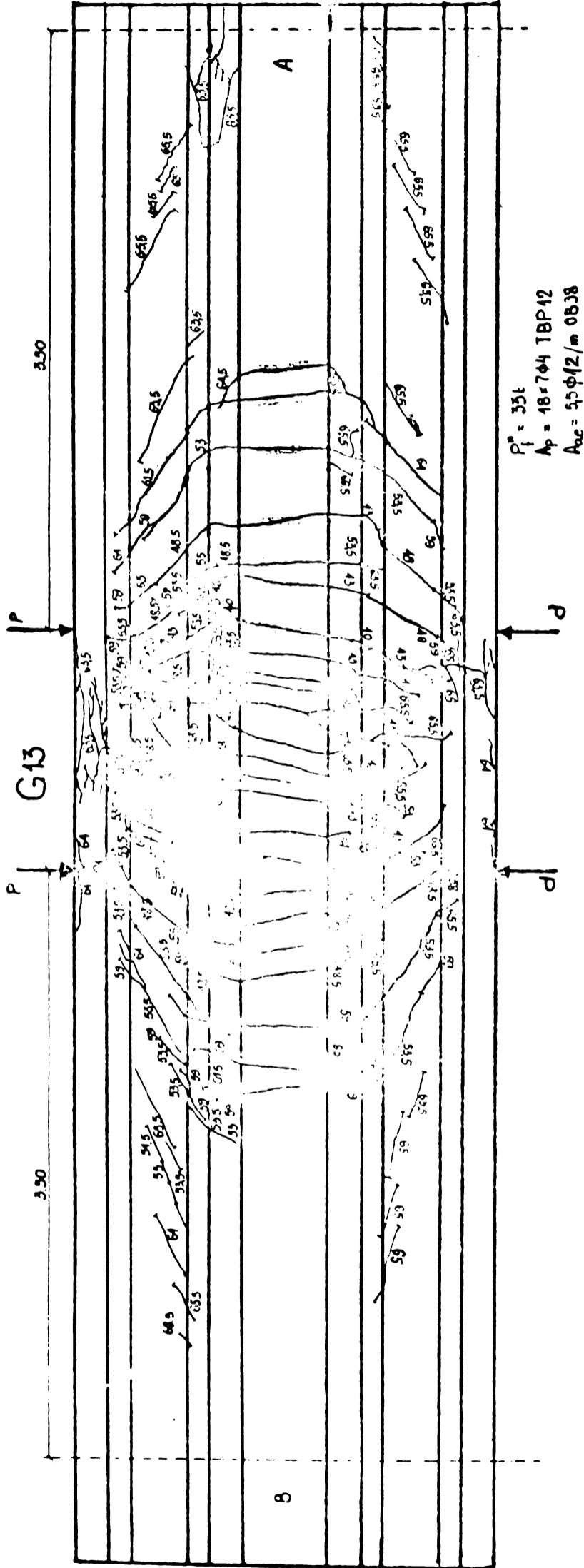
A. I. 10.



A. I. 11.



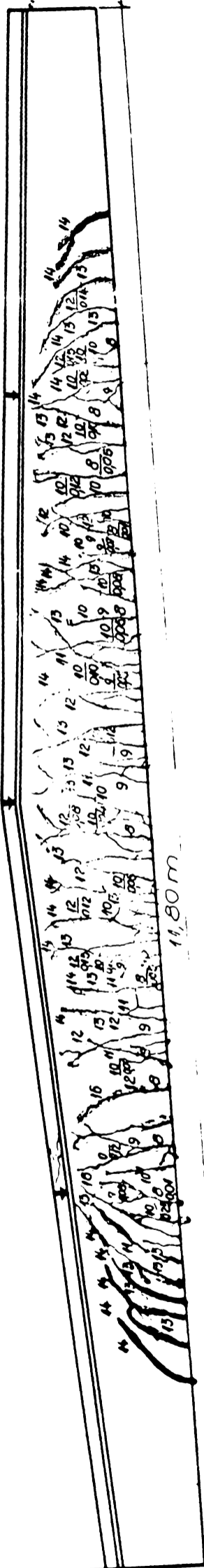
A. I. 12.



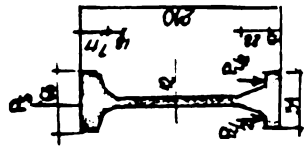
$P_f = 35t$
 $A_p = 18 \times 7 \phi 4 \text{ TBP} 12$
 $A_{oc} = 55 \phi 2 / m \text{ OB} 38$

A. I. 13.

RELEVEU FISURI GRINDA 612-6 (4φ25 PC 90)

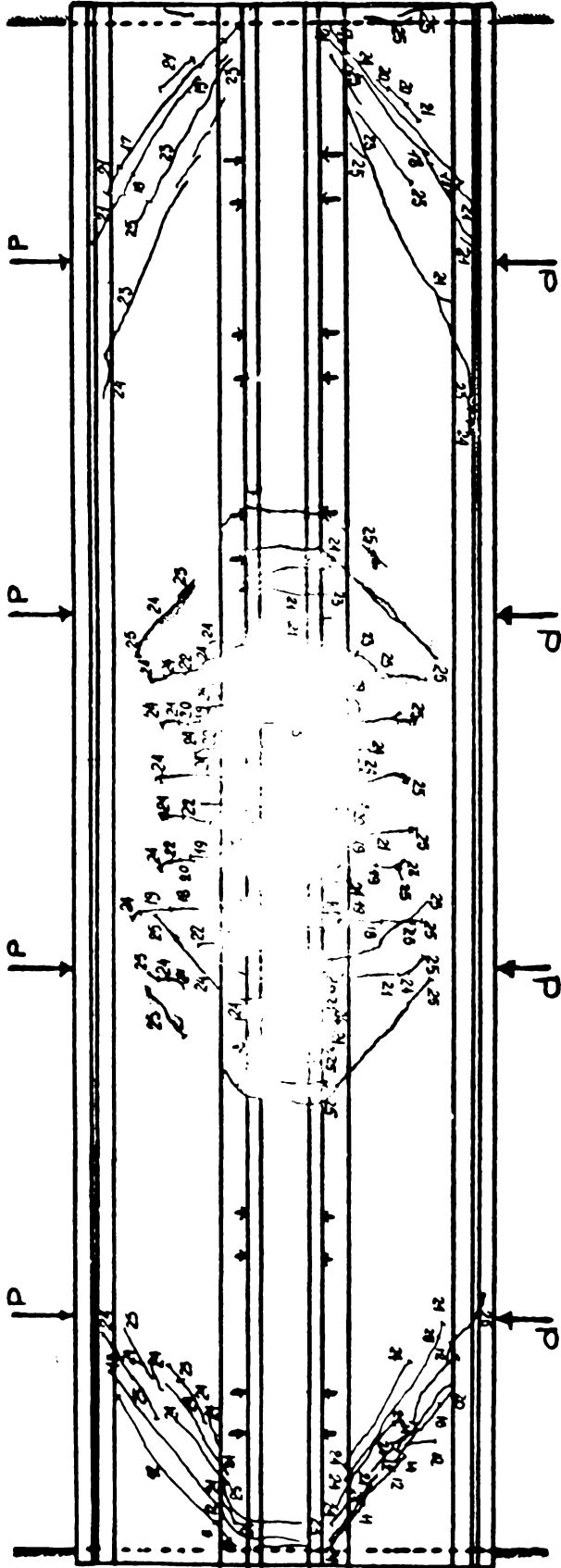


A. I. 14.



$A_p = 24 \times 7 \phi 4$ [BP12

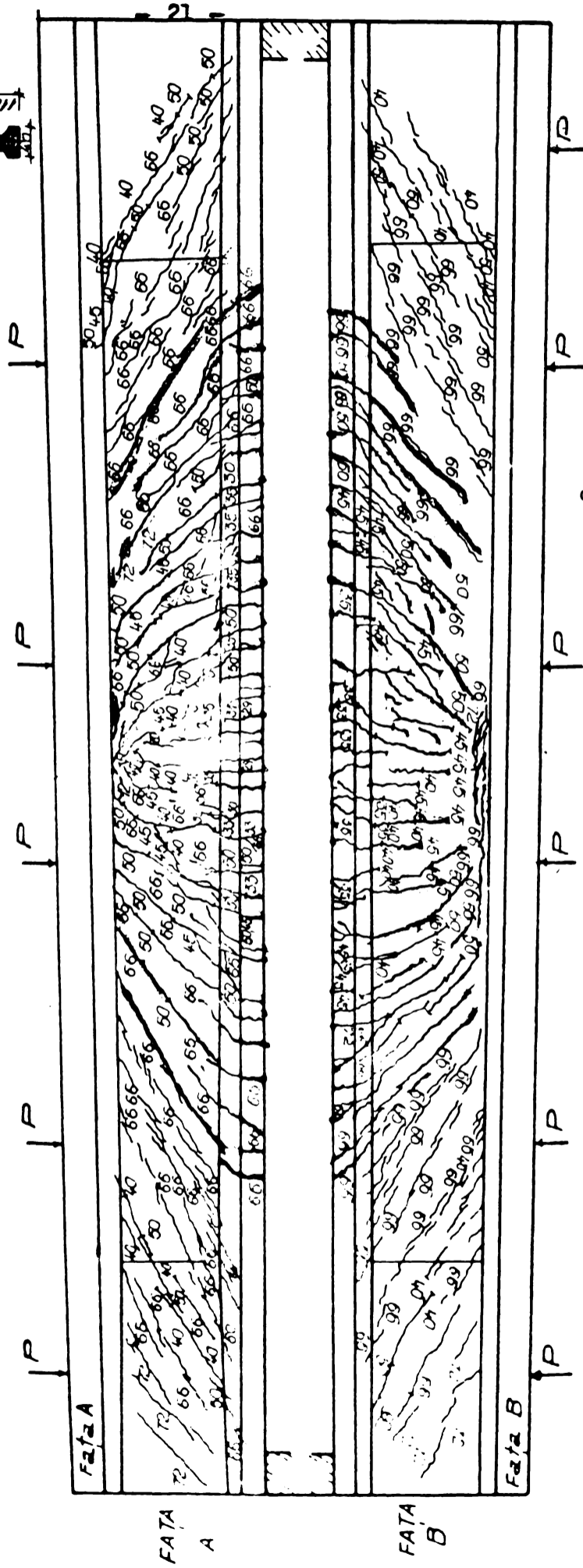
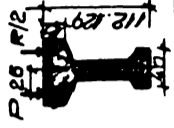
G18-12-7



$P_{f_{301}}^a = 6856 + 1286$

A. I 15.

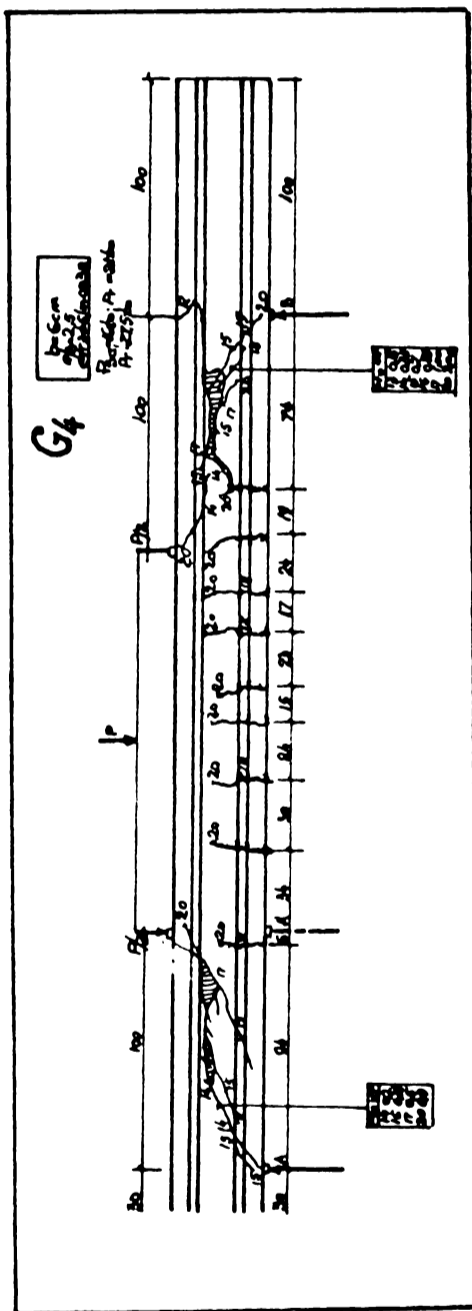
Schema de încărcare



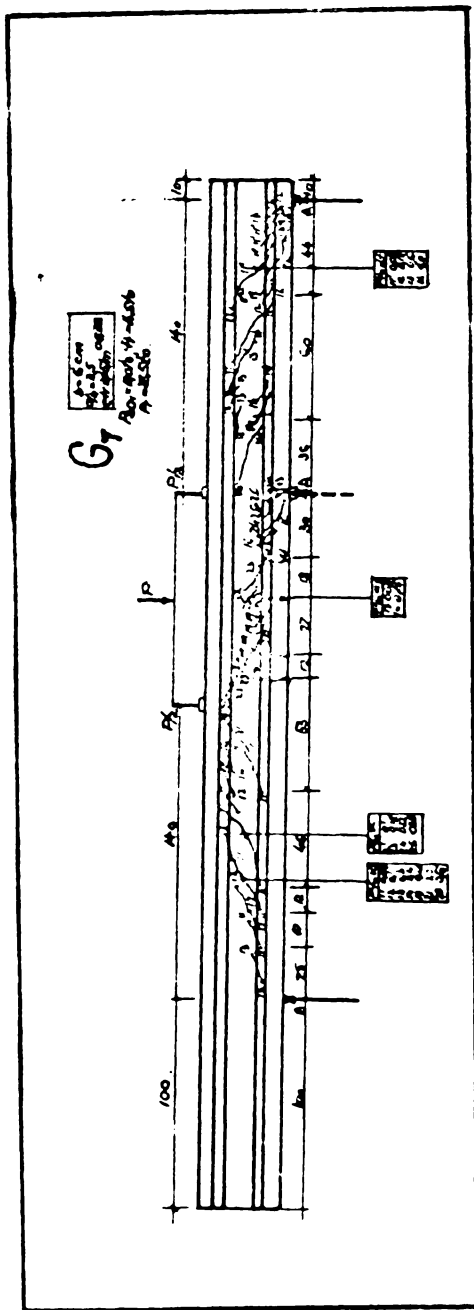
$P = 24.5t$
 $P_{is\ normal} = 27.5t$ $P = 66t$
 $P_{is\ inel} = 40t$

$q = 17.05t/m$

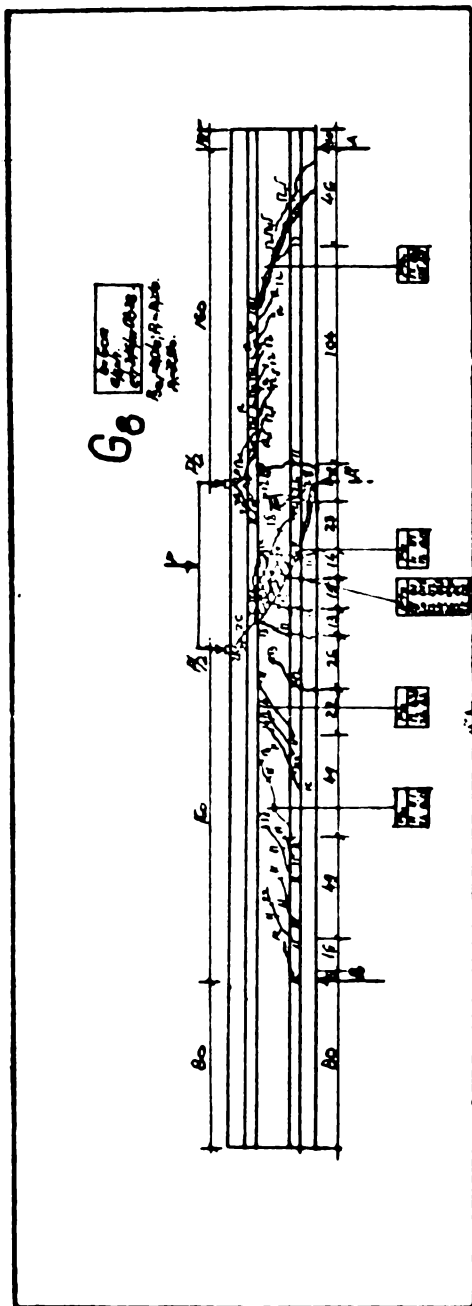
A. I. 16. RELEVUL FISURILOR G9-1a



A. I. 18.

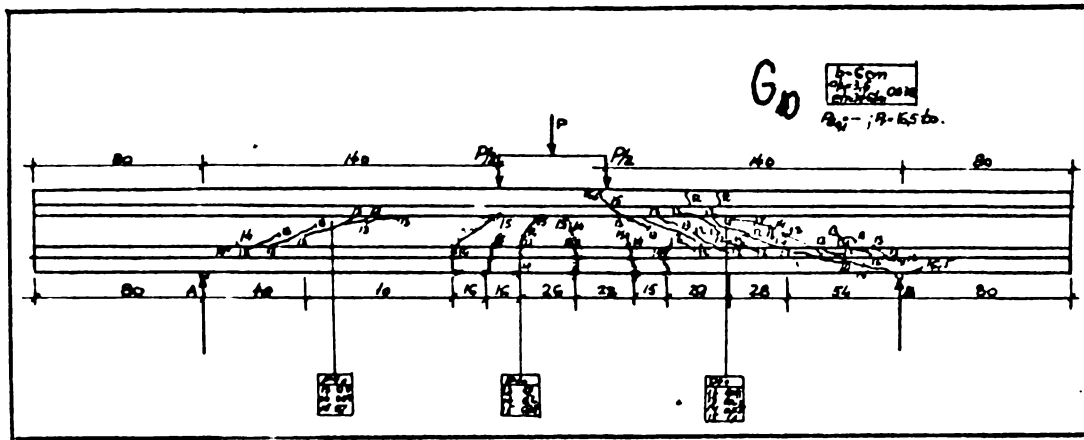


A. I. 19.

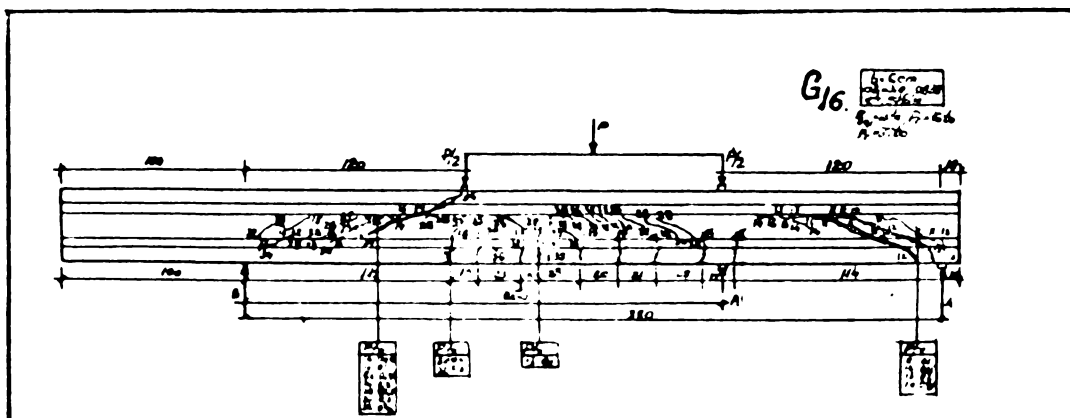


A. I. 20.

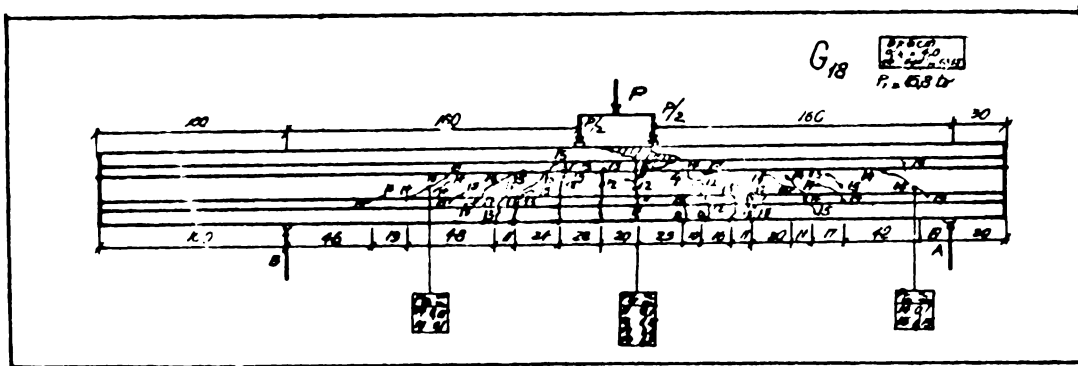
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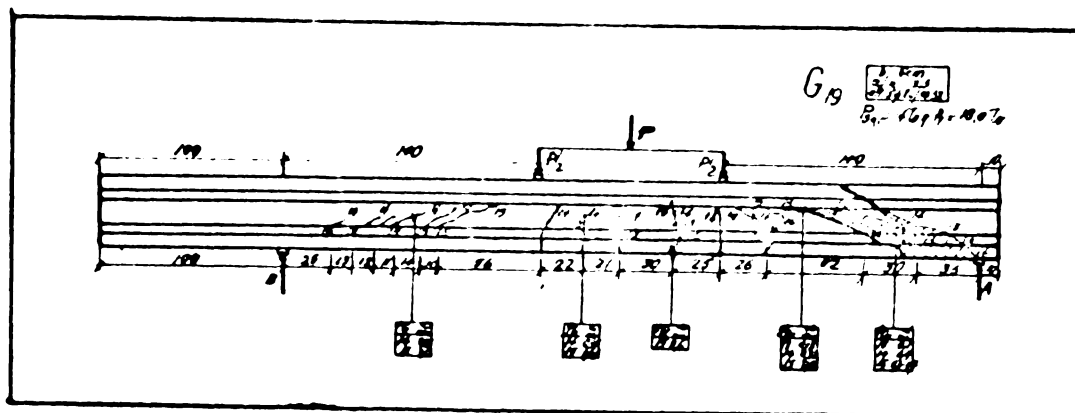
A. I. 21.



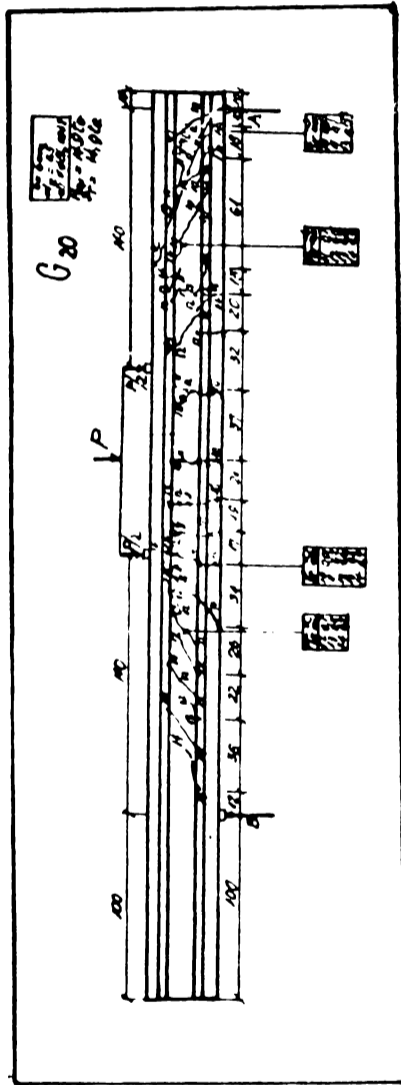
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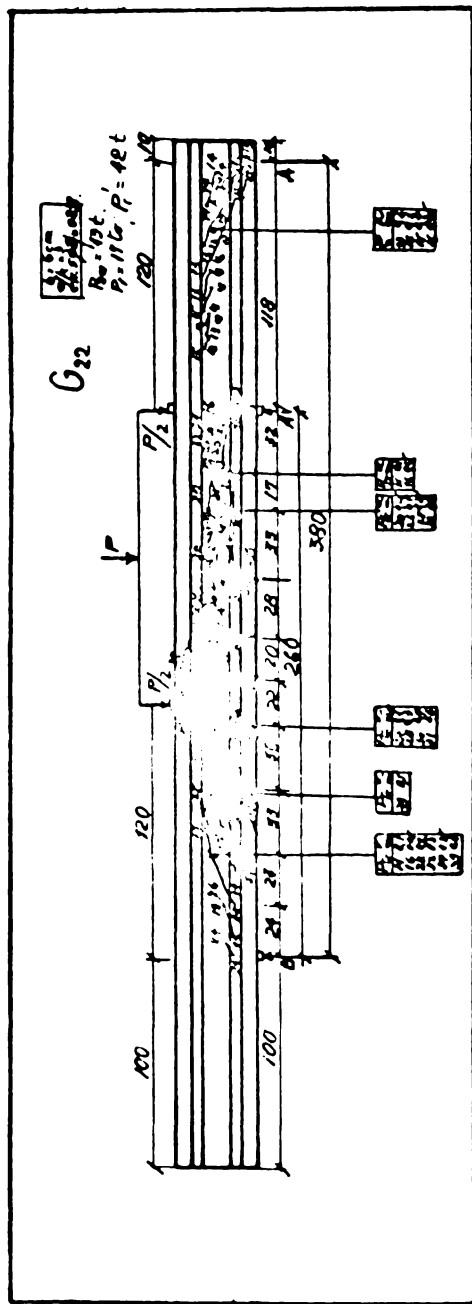
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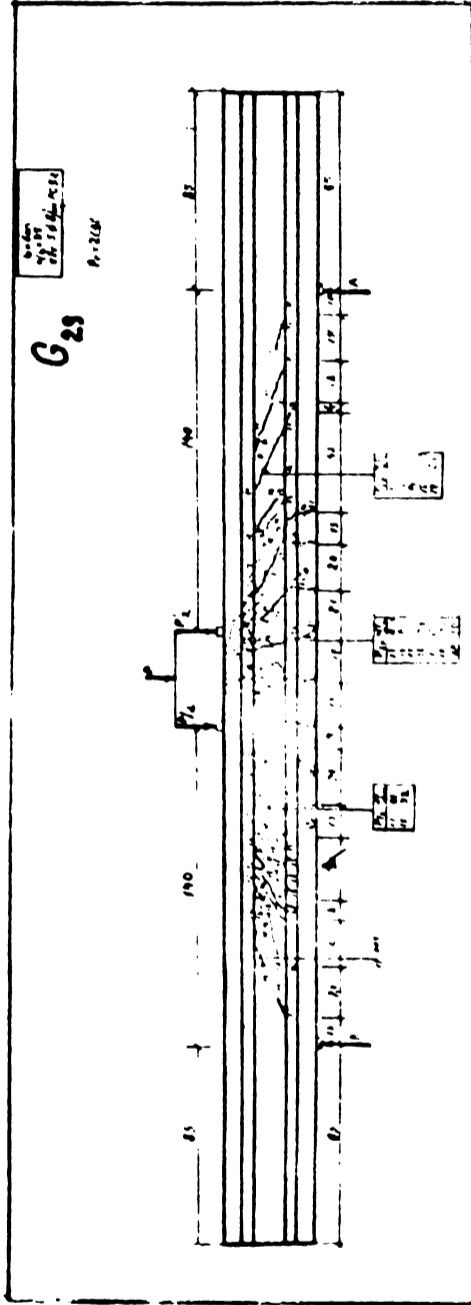
A. I. 25.



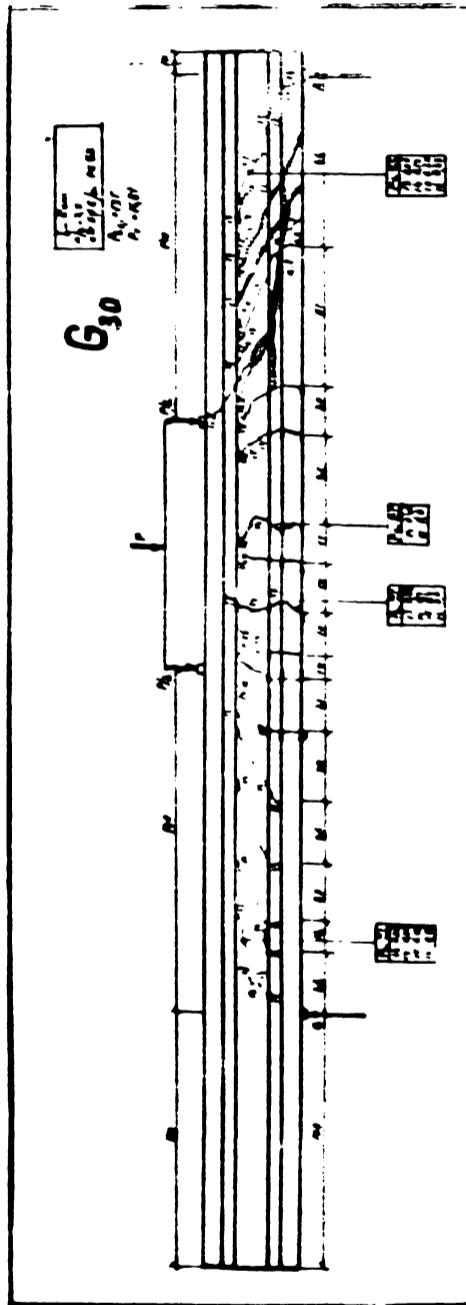
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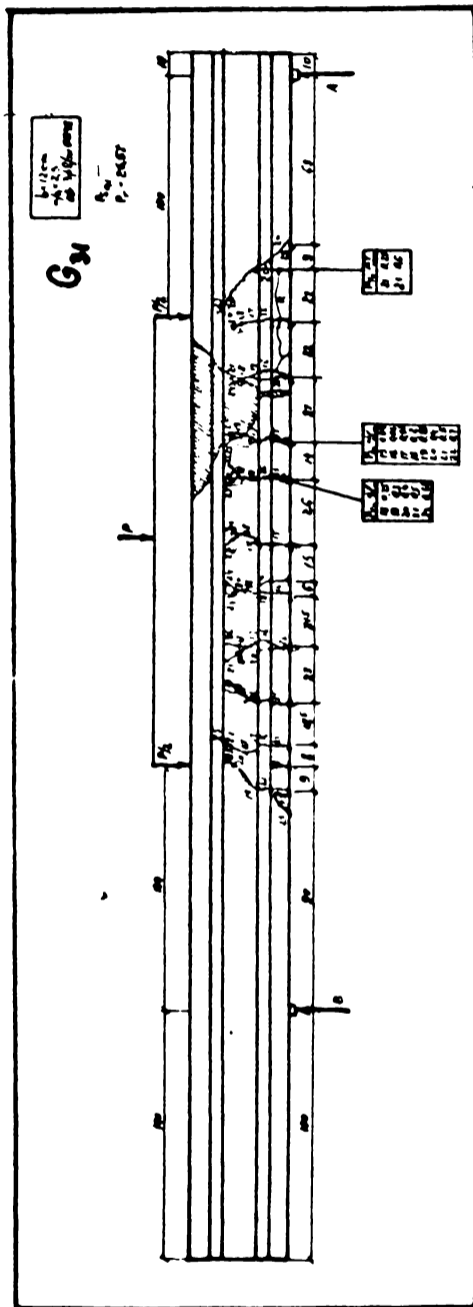
A. I. 27.



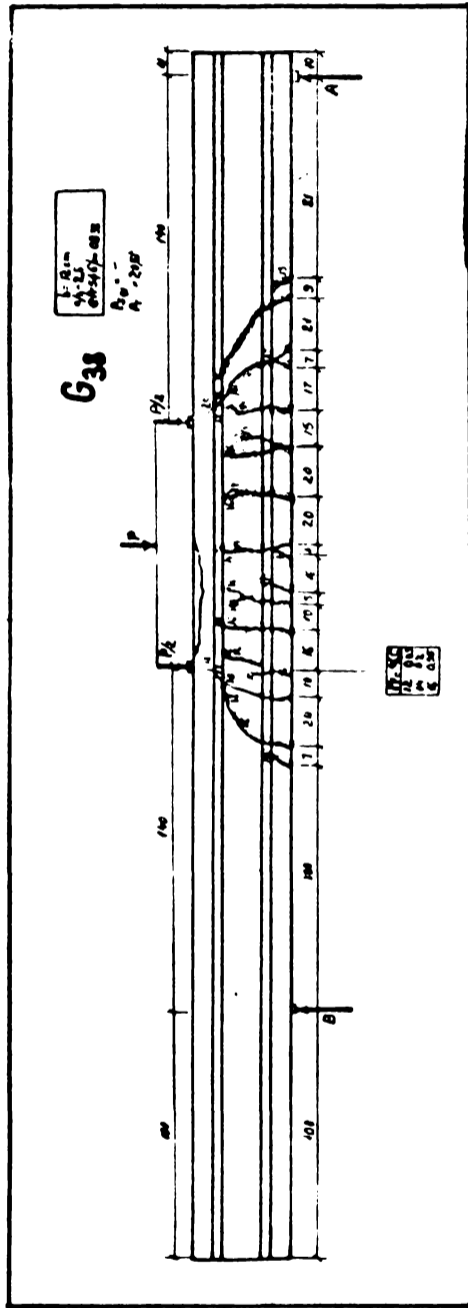
A. I. 28.



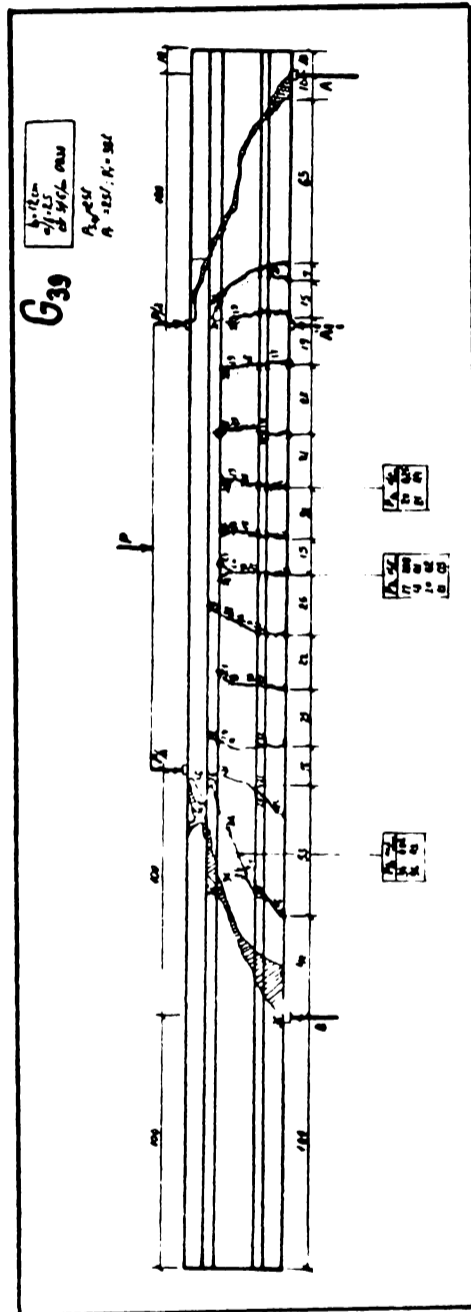
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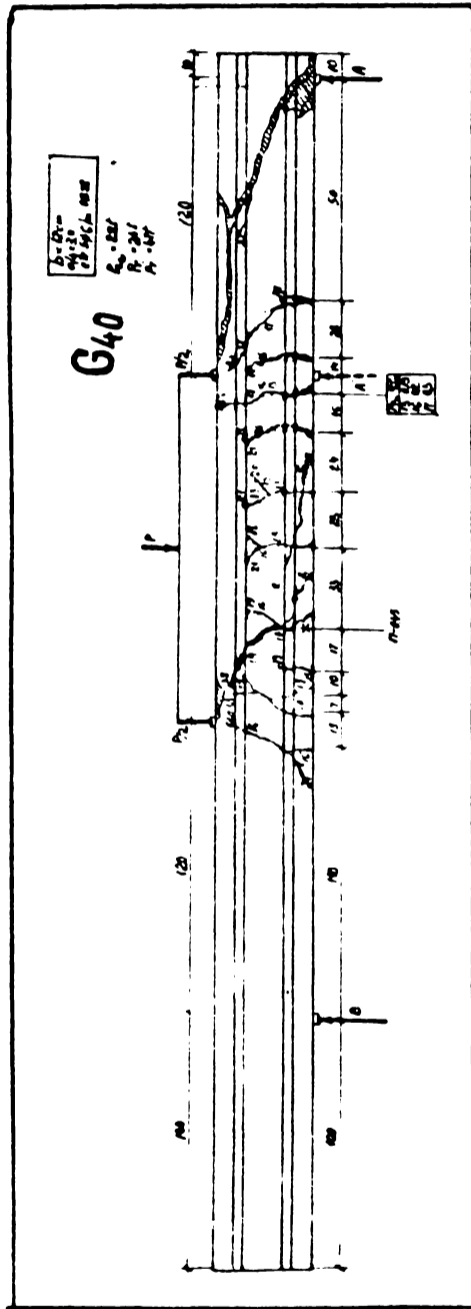
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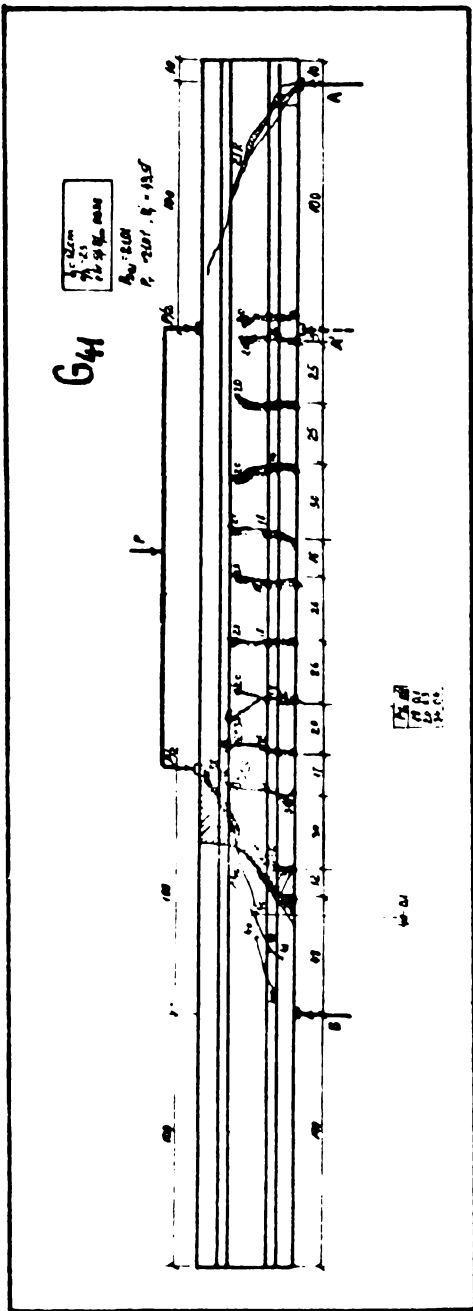
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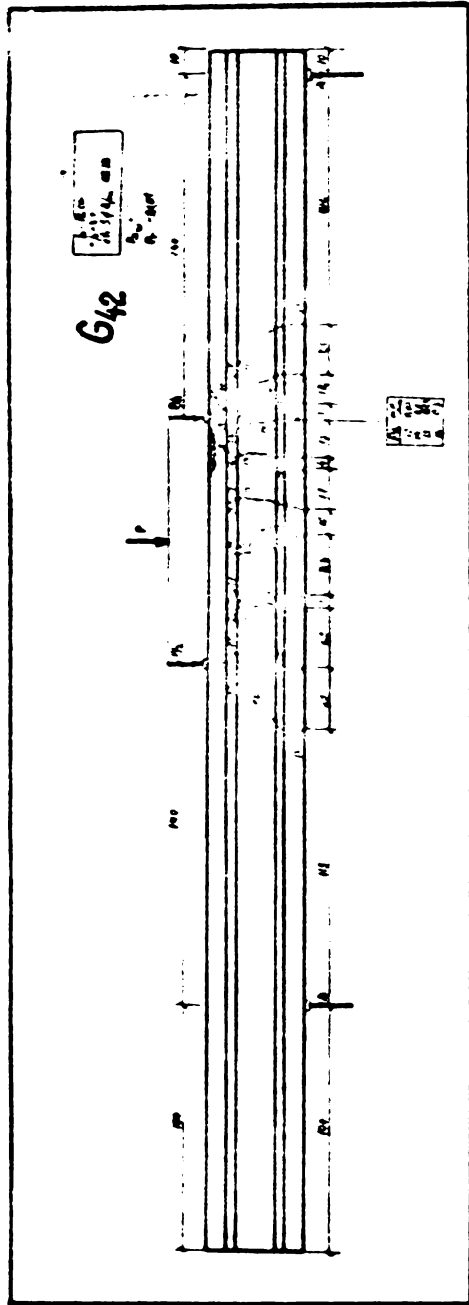
A. I. 23.



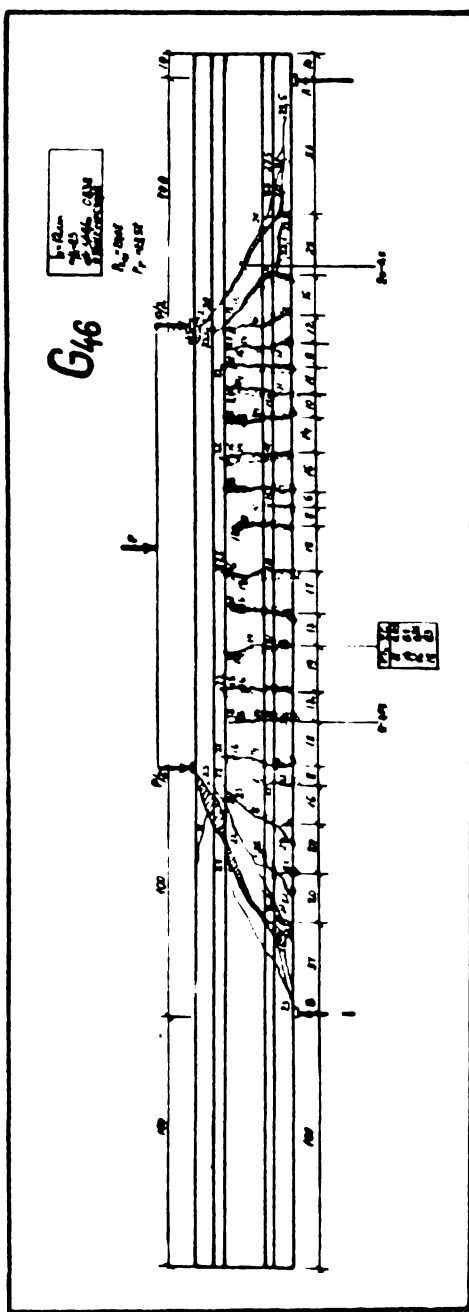
A. I. 34.



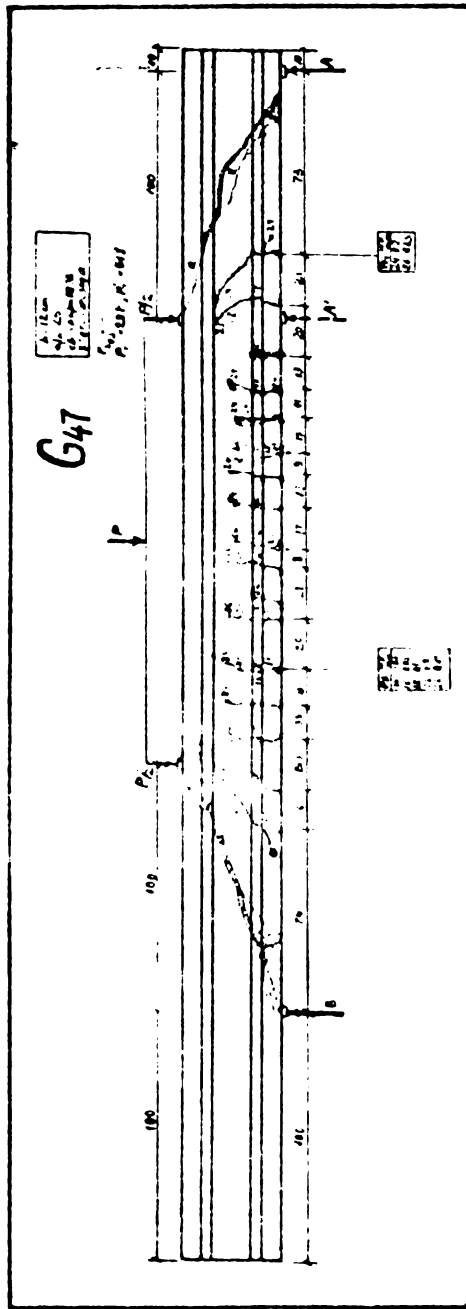
A. I. 35.



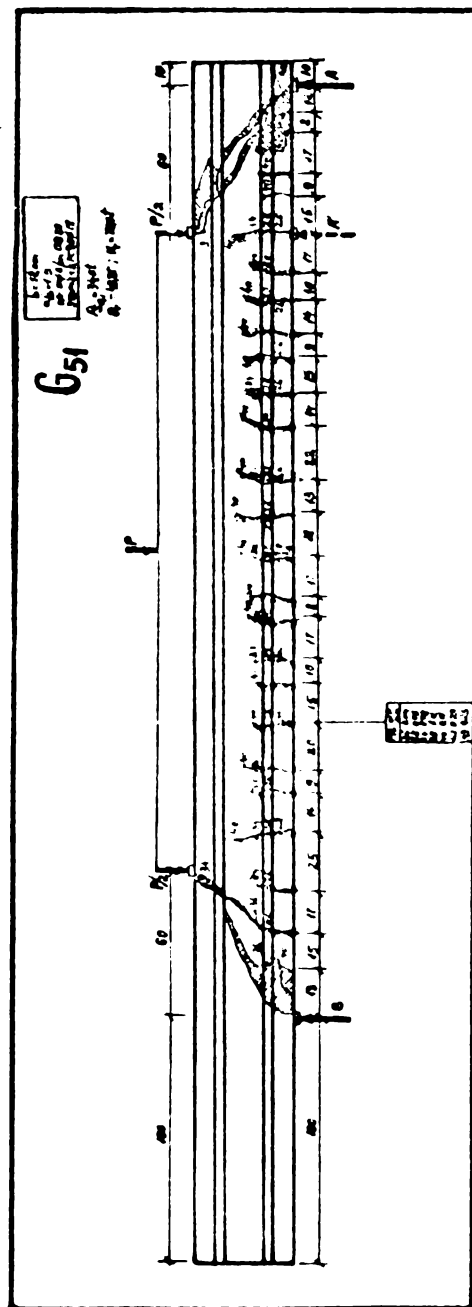
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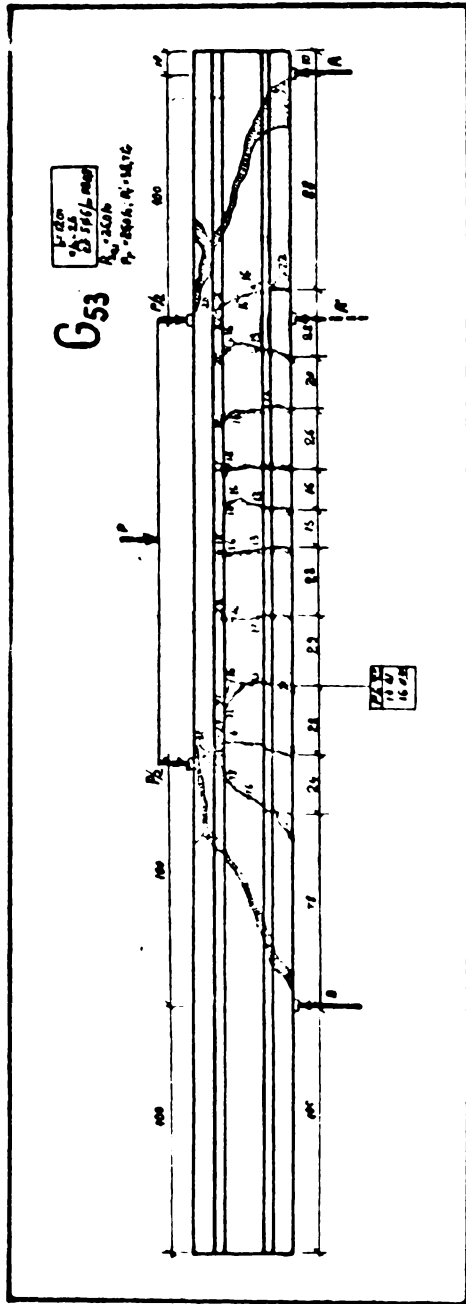
A. I. 39.



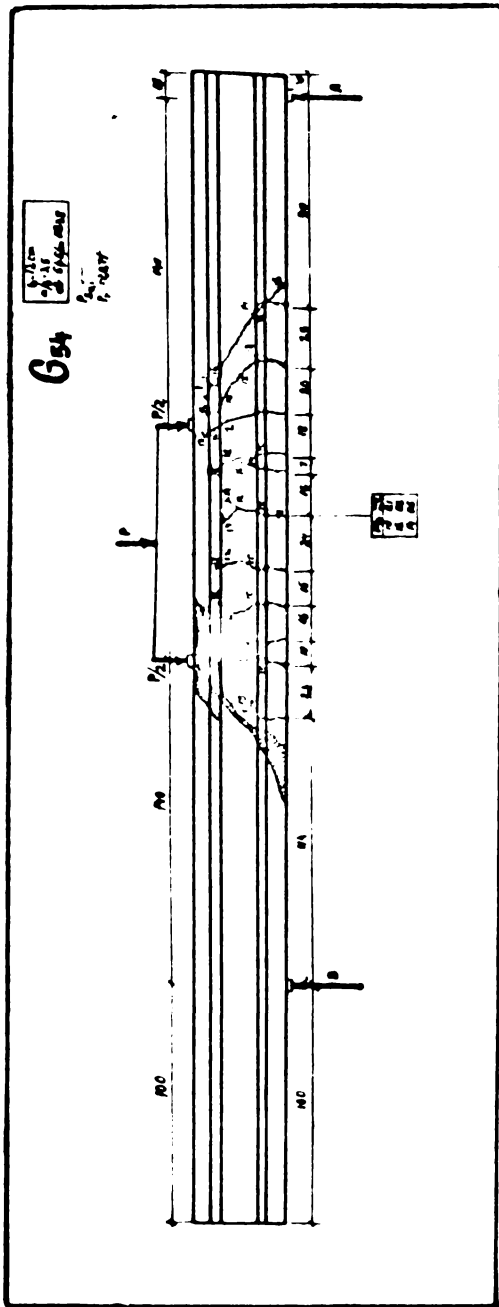
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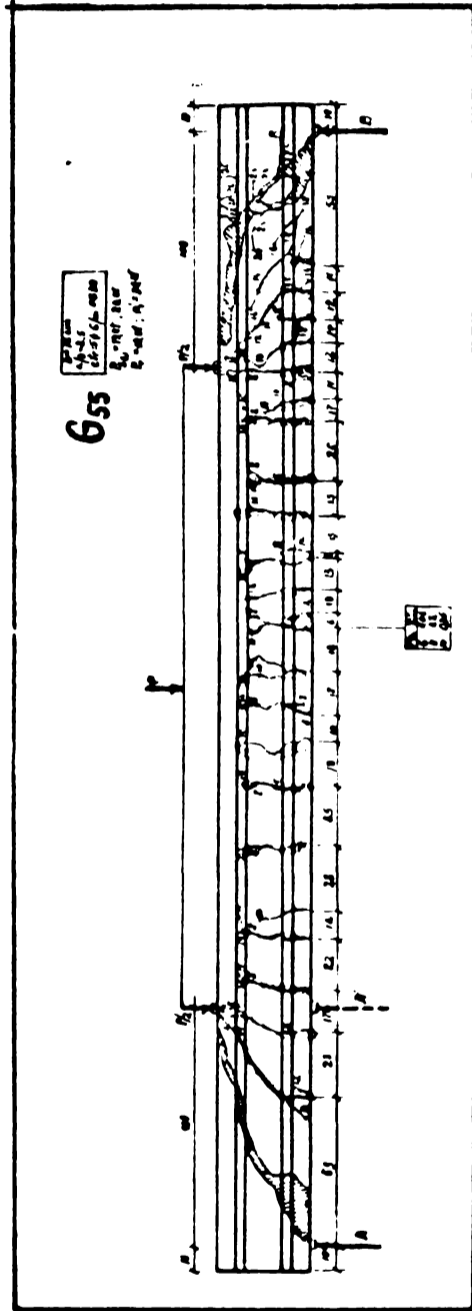
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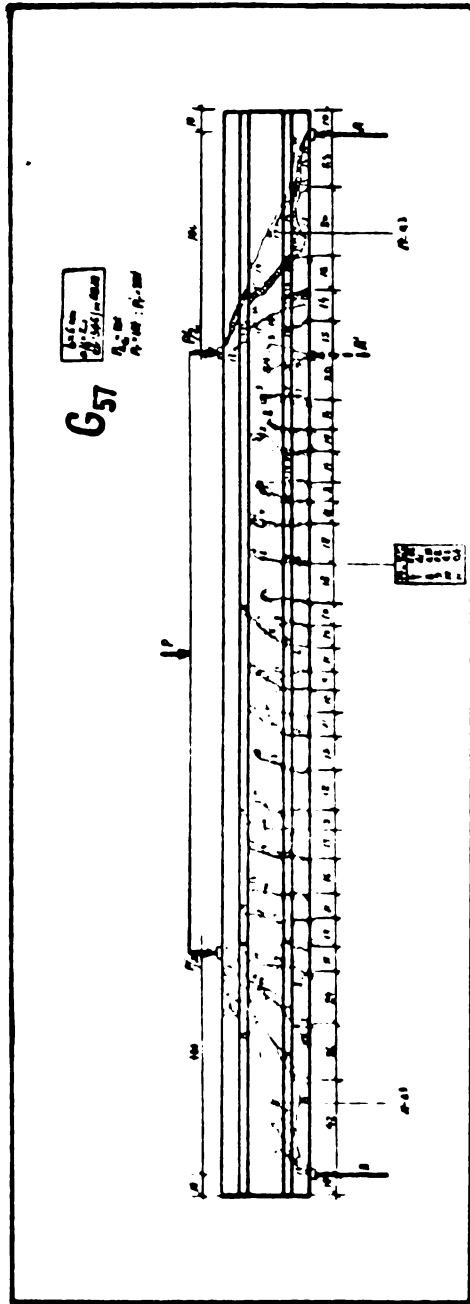
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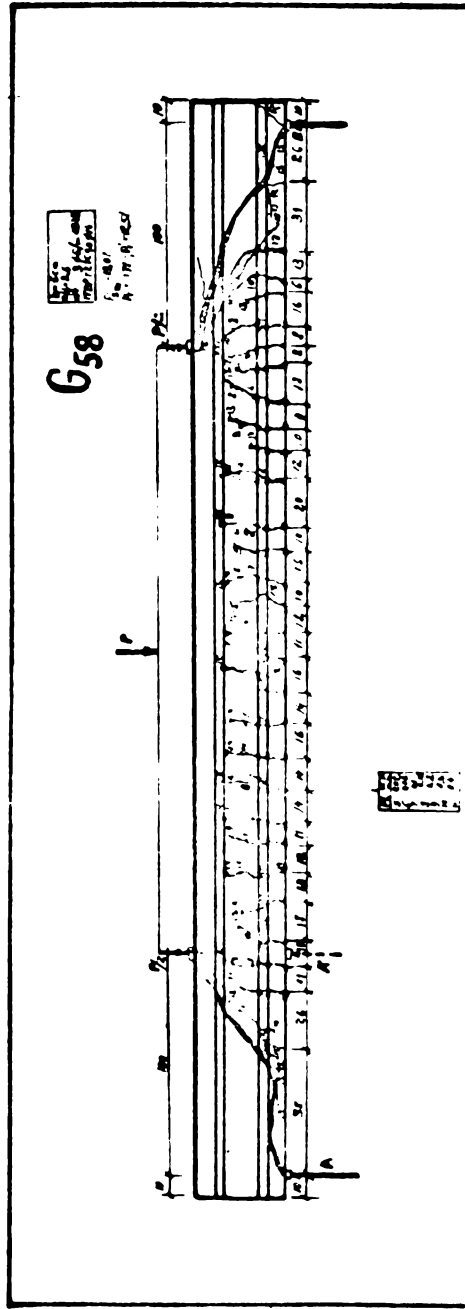
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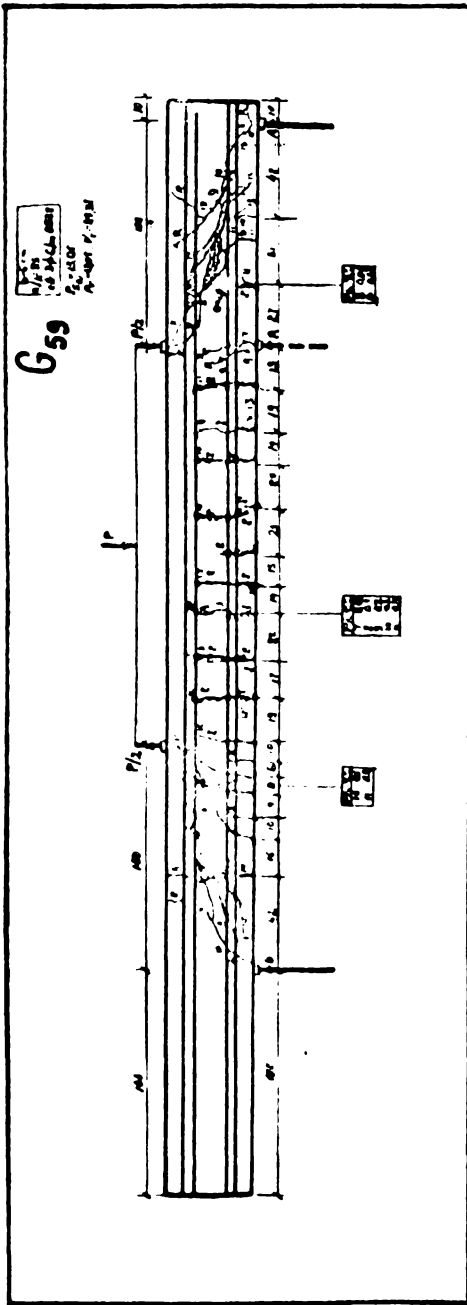
A. I. 48.



A. I. 50.



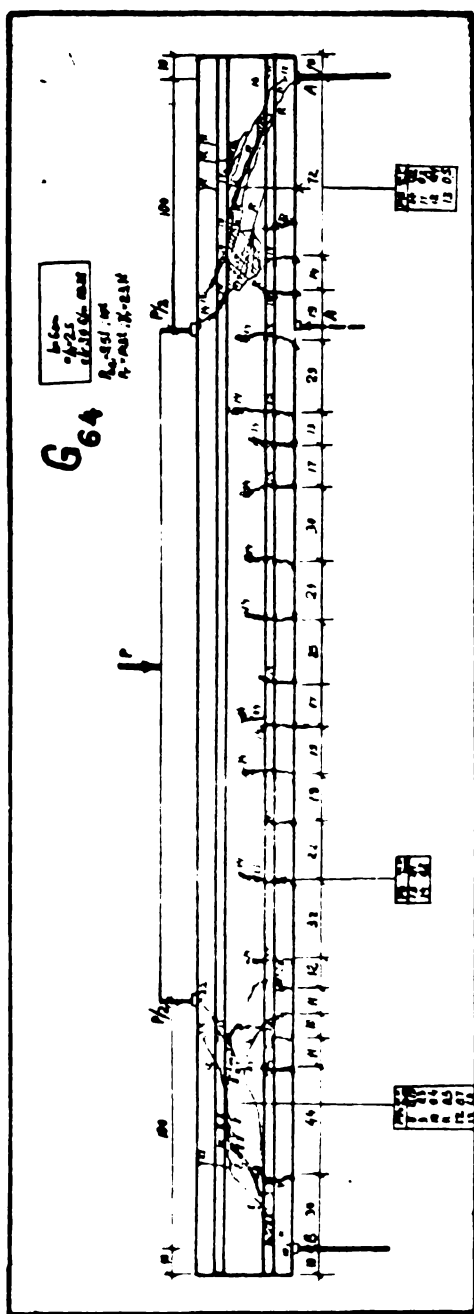
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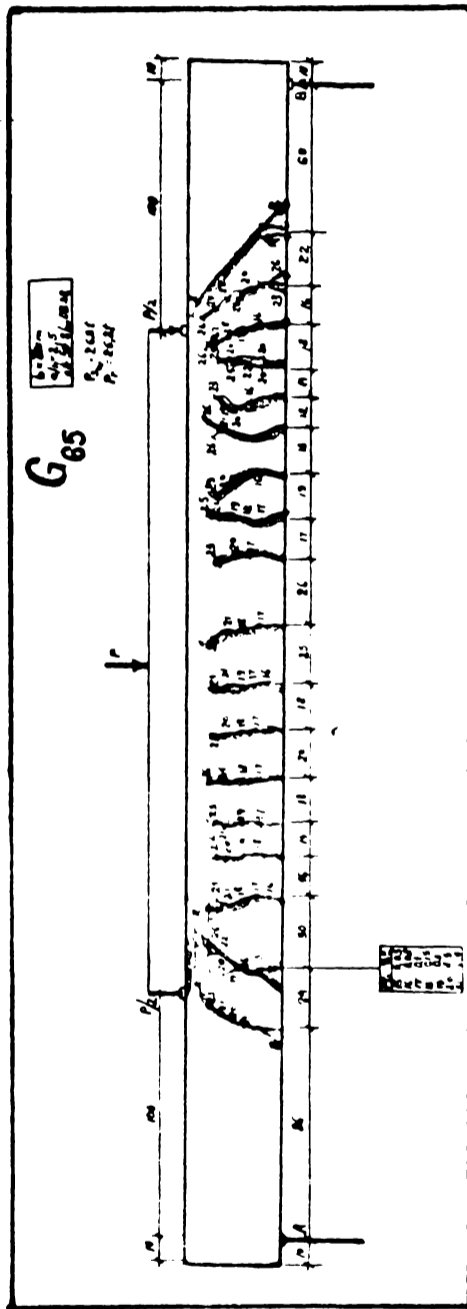
A. I. 52.

A handwritten musical score for guitar, oriented vertically on the page. The score is written on six staves, each representing a string. The notation includes various rhythmic values, accidentals, and articulation marks. A large, bold letter 'G' is written vertically on the left side of the staves. There are three small rectangular boxes with handwritten text, likely indicating fingerings or specific techniques, located at the top of the first, second, and fifth staves. The score is enclosed in a rectangular border.

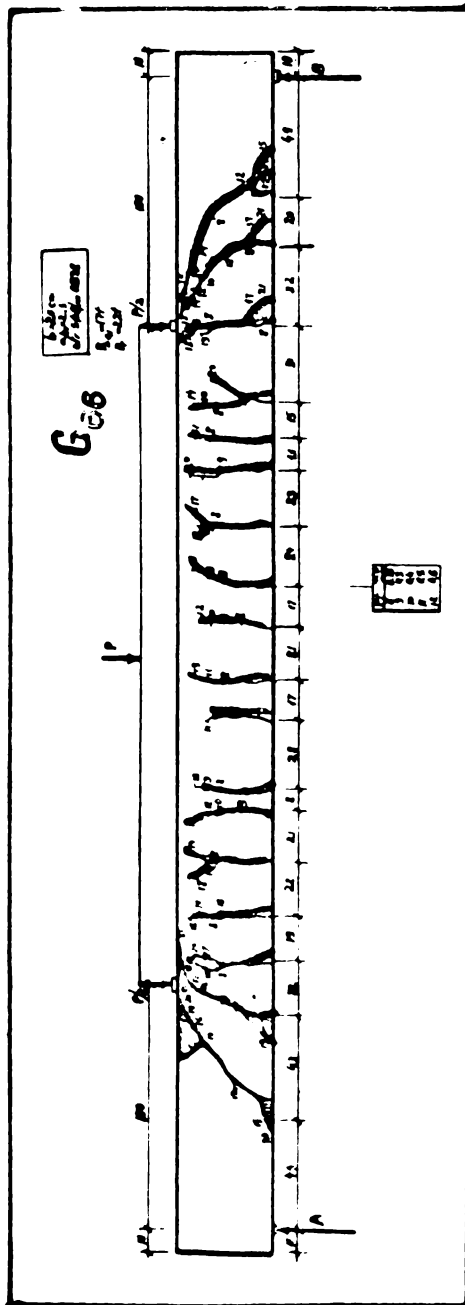
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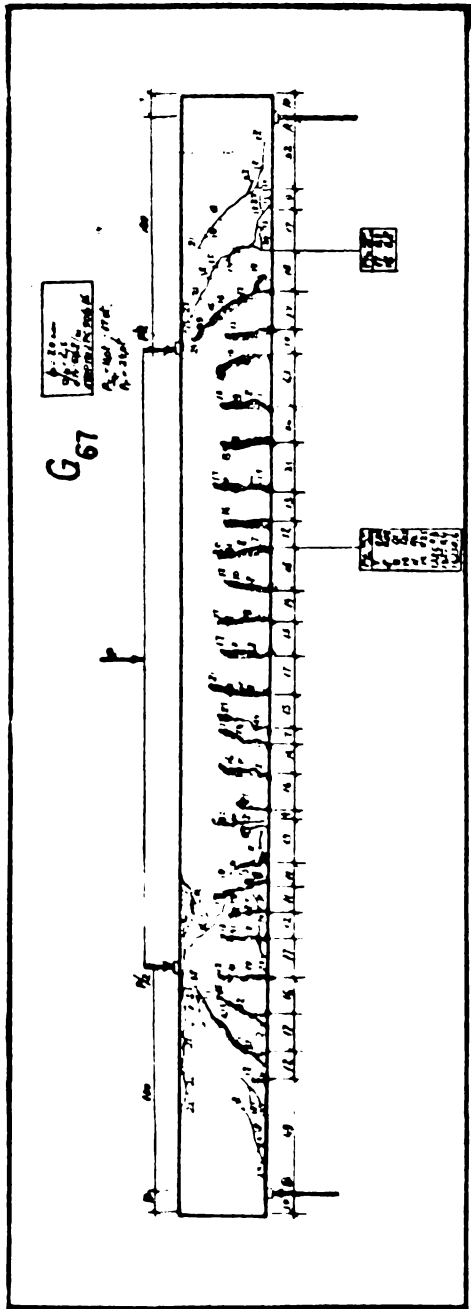
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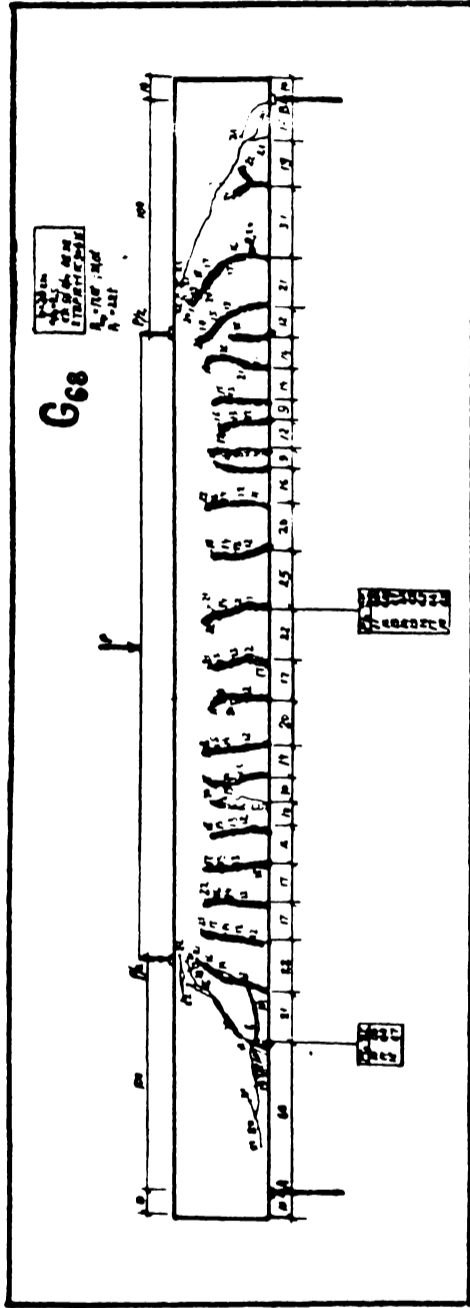
A. I. 56.



A. I. 57.



A. I. 58.



A. I. 59.

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Foto 1. Execuția elementelor G 1 ... G 14

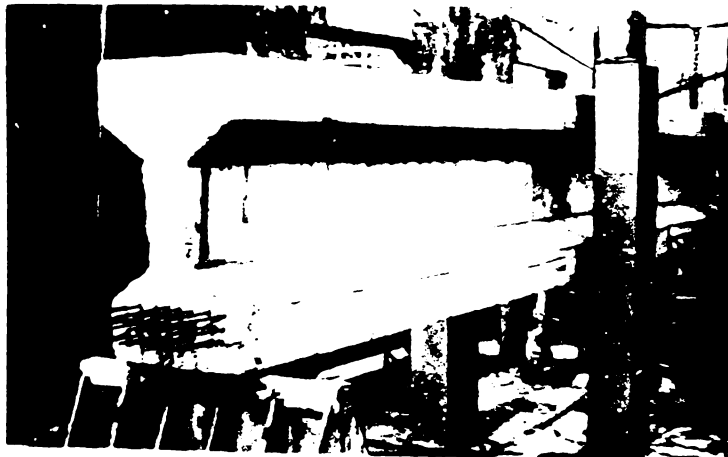


Foto 2. Grindă de tipul G 1 ... G 14



Foto 3. Sistemul de acționare (G 1 ... G 14)

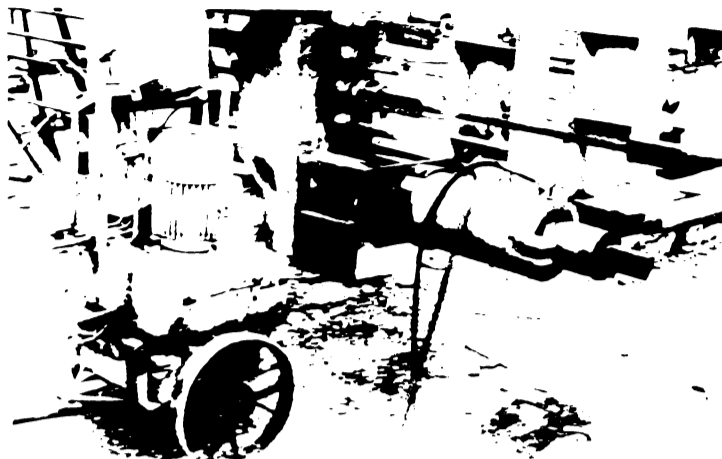


Foto 4. Tensionarea individuală a barelor PC 90
(Aspect de la execuția grinzii G 12-6)

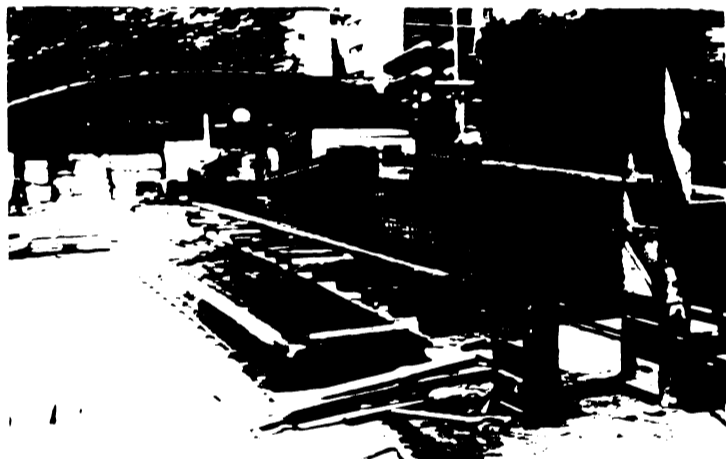


Foto 5. Montarea carcusei
grinzii G 12-6



Foto 6. Armare grinzii G 12-6 4 2 25 10 90



Foto 7.

Detalii de armare la capetele grinzii G 12-6

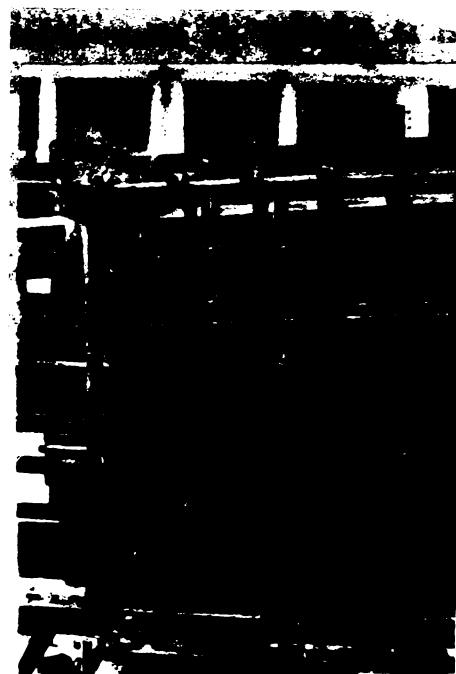


Foto 8.



Foto 9. Comparatoare montate pe bare la transfer



Foto 10. Aspect de la încercarea grinzii G 12-6



Foto 11.

Cedarea grinzii G 12-6. Detaliu.



Foto 12.



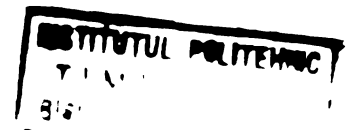
Foto 13. Relevu fisuri la grinda G 12-6



Foto 14. Armarea grinzii G 18-12-2



Foto 15. Detalii de armare la capăt



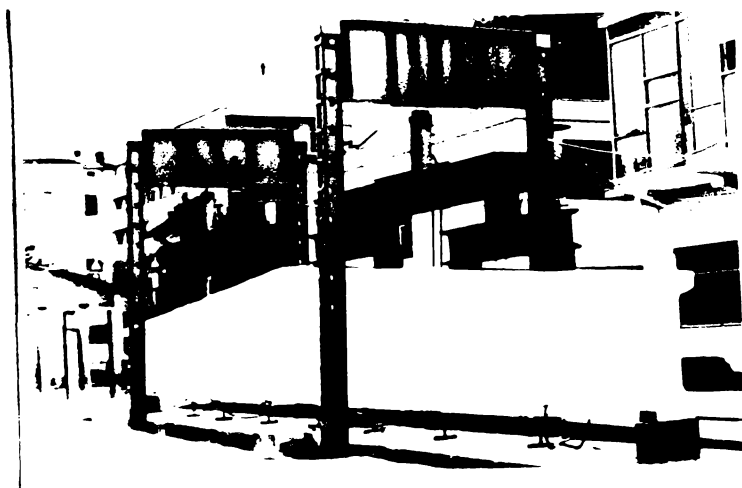


Foto 16. Grinda G 18-12-2 pregătită pentru încercare



Foto 17. Detaliu de cedare



Foto 18. Execuția grinzilor
G9 la și G9 m la



Foto 19. Blocarea to-
roanelor la
capăt. Detaliu

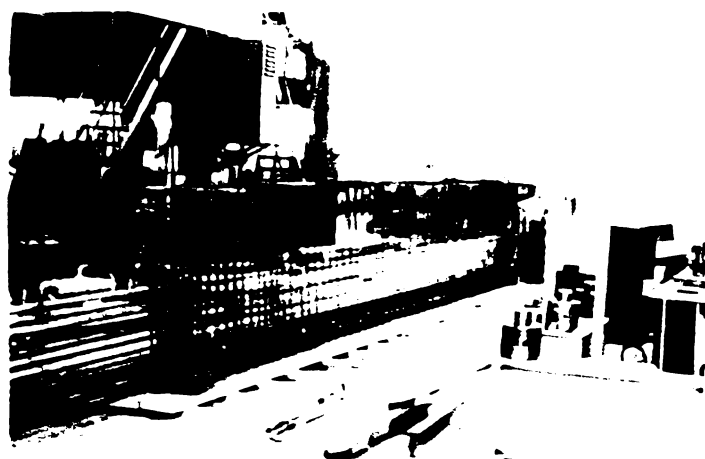


Foto 20. Executarea carcaselor la grinzile longitu-
dinale din beton precomprimat de 9 m.

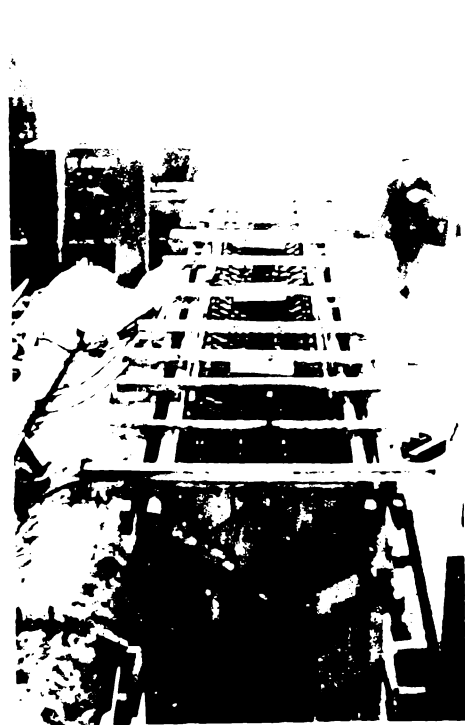


Foto 21. Grinda G9 la cofrată



Foto 22. Grinzile de 9 m
după turnare

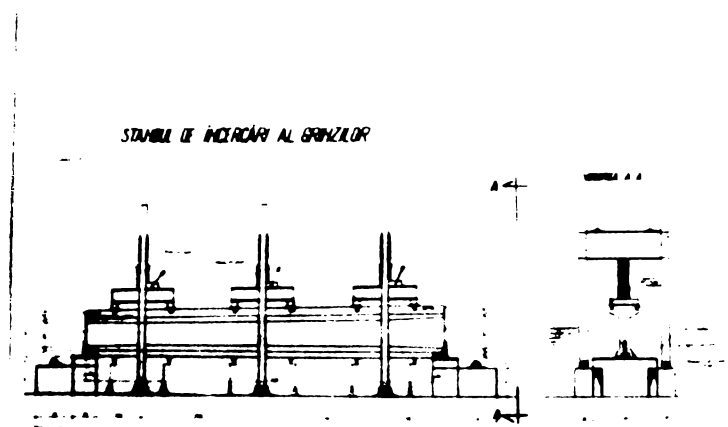


Foto 23. Schema de încercare
pentru grinzile longi-
tudinale de 9 m.
(G9 la și G9 m la)



Foto 24. Detaliu rezemare (G9 la)

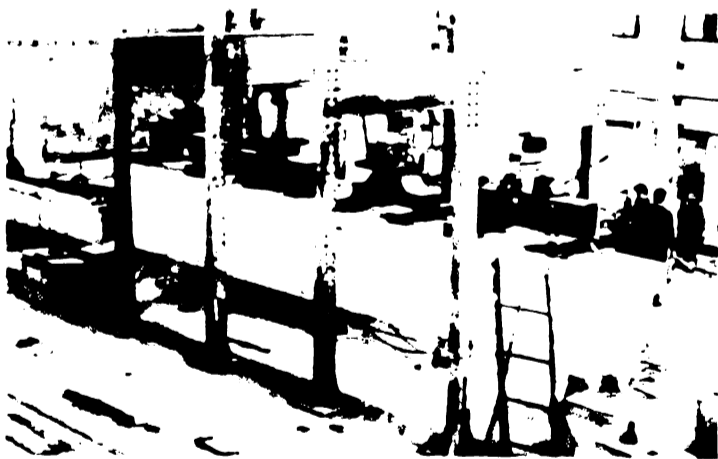


Foto 25. Sistemul de acționare
(Încercarea grinzii
G 9 la).



Foto 26. Măsurarea alunecă-
cării toroanelor
la capăt.

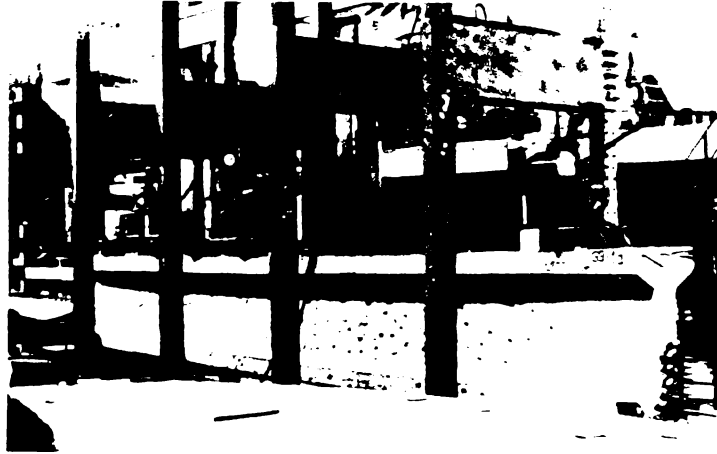


Foto 27. Incercarea grinzii G 9 la



Foto 28.

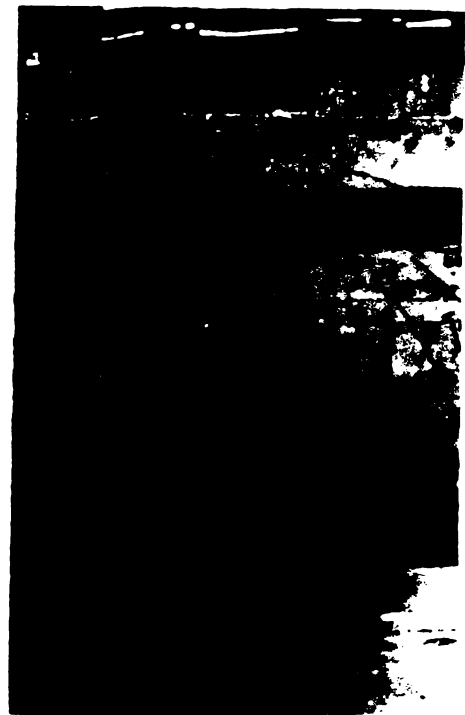


Foto 29.

Zona de cedare. Detalii.