

APPENDIX E1

MARSHALL TEST RESULT

No.	Nama	a %	b %	c gram	d gram	e gram	f ml	g	h	i	j	k %
1	Neat Bitumen 1	7.5	6.98	1143	1159	575	584	1.96				
2	Neat Bitumen 2	7.5	6.98	1116	1122	585	537	2.08				
3	Neat Bitumen 3	7.5	6.98	1126	1141	565	576	1.95				
4	Neat Bitumen 4	7.5	6.98	1143	1154	584	570	2.01				
	Rata-rata Penetrasi							2.00	2.47	11.62	68.87	19.51
5	Starbitumen 1	7.5	6.98	1129	1163	595	568	1.99				
6	Starbitumen 2	7.5	6.98	1165	1185	630	555	2.10				
7	Starbitumen 3	7.5	6.98	1177	1183	630	553	2.13				
8	Starbitumen 4	7.5	6.98	1163	1177	625	552	2.11				
	Rata-rata Starbit							2.08	2.42	13.69	71.68	14.63
9	Neat Bitumen + Feldspart 20% 1	7.5	6.98	1174	1181	635	546	2.15				
10	Neat Bitumen + Feldspart 20% 2	7.5	6.98	1172	1193	640	553	2.12				
11	Neat Bitumen + Feldspart 20% 3	7.5	6.98	1171	1196	651	545	2.15				
12	Neat Bitumen + Feldspart 20% 4	7.5	6.98	1184	1205	655	550	2.15				
	Rata-rata							2.14	2.50	11.33	73.82	14.85
13	Neat Bitumen + Feldspart 25% 1	7.5	6.98	1165	1181	636	545	2.14				
14	Neat Bitumen + Feldspart 25% 2	7.5	6.98	1155	1176	617	559	2.07				
15	Neat Bitumen + Feldspart 25% 3	7.5	6.98	1185	1210	650	560	2.12				
16	Neat Bitumen + Feldspart 25% 4	7.5	6.98	1173	1169	640	529	2.22				
	Rata-rata							2.13	2.52	10.71	73.53	15.75

B.Jenis Aspal Penetrasi	1.2
B.Jenis Aspal Starbit	1.06
B.Jenis Aspal Penetrasi + Feldspart 20%	1.32
B.Jenis Aspal Penetrasi + Feldspart 25%	1.39
B.Jenis Agregat	2.7

Keterangan :

- a = % aspal terhadap batuan
- b = % aspal terhadap Campuran
- c = Berat (gram)
- d = Berat dalam keadaan jenuh (gram)
- e = Berat dalam air (gram)
- f = Isi (ml) d-e
- g = berat isi benda uji = c/f
- h = berat jenis maksimum (teoritis) $100 / (\% \text{ agregat} / \text{B.J. agregat}) + (\% \text{ aspal} / \text{B.J. aspal})$
- i = $(b \cdot g) / (\text{B.J. aspal})$
- j = $(100 - b) / \text{B.J. agregat}$
- k = Jumlah kandungan rongga (%) = $100 - i - j$
- l = persen rongga terhadap agregat = $100 - j$ (VMA)
- m = persen rongga terisi aspal = $100 \cdot i / l$ (VFA)
- n = persen rongga terhadap campuran = $100 - 100 \cdot g / h$ (VIM)
- o = pembacaan arloji tekan
- p = angka korelasi
- q = stabilitas (0° kalibrasi alat)
- r = stabilitas (kg)
- s = alir / flow (mm)
- t = kekakuan / stiffness (kg/mm)

APPENDIX E2

MARSHALL TEST RESULT

No.	Nama	l %	m %	n %	o	p	q x 32,7864	r kg	s mm	t kg/mm
1	Neat Bitumen 1				25	1.14	647.5	738.2	6.6	112.6
2	Neat Bitumen 2				26	1.09	673.4	734.0	6.6	110.6
3	Neat Bitumen 3				27	1.25	699.3	874.2	6.7	130.2
4	Neat Bitumen 4				26	1.25	673.4	841.8	6.6	128.4
	Rata-rata Penetrasi	31.13	37.33	19.03	26	1.18	673.4	796.3	6.6	120.4
5	Starbitumen 1				34	1.09	880.6	959.9	5.5	173.6
6	Starbitumen 2				32	1.09	828.8	903.4	5.1	175.9
7	Starbitumen 3				30	1.25	777.0	971.3	5.8	168.4
8	Starbitumen 4				31	1.25	802.9	1003.7	5.3	189.6
	Rata-rata Starbit	28.32	48.35	14.00	31.8	1.17	822.4	962.2	5.4	176.9
9	Neat Bitumen + Feldspart 20% 1				5	1.19	129.5	154.1	5.5	27.9
10	Neat Bitumen+ Feldspart 20%				27	1.19	699.3	832.2	5.8	144.3
11	Neat Bitumen+ Feldspart 20%				27	1.19	699.3	832.2	6.3	131.7
12	Neat Bitumen+ Feldspart 20%				26	1.19	673.4	801.4	6.0	133.5
	Rata-rata	26.18	43.26	14.42	26.7	1.19	690.7	821.9	6.0	136.5
13	Neat Bitumen + Feldspart 25% 1				30	1.19	777.0	924.7	5.8	160.3
14	Neat Bitumen + Feldspart 25% 2				31	1.25	802.9	1003.7	5.9	169.4
15	Neat Bitumen + Feldspart 25% 3				29	1.14	751.1	856.3	6.0	142.6
16	Neat Bitumen + Feldspart 25% 4				29	1.19	751.1	893.9	5.9	150.9
	Rata-rata	26.47	40.48	15.36	29.8	1.19	770.6	918.9	5.9	155.8

B.Jenis Aspal Penetrasi	1.2
B.Jenis Aspal Starbit	1.06
B.Jenis Aspal Penetrasi + Feldspart 20%	1.32
B.Jenis Aspal Penetrasi + Feldspart 25%	1.39
B.Jenis Agregat	2.7

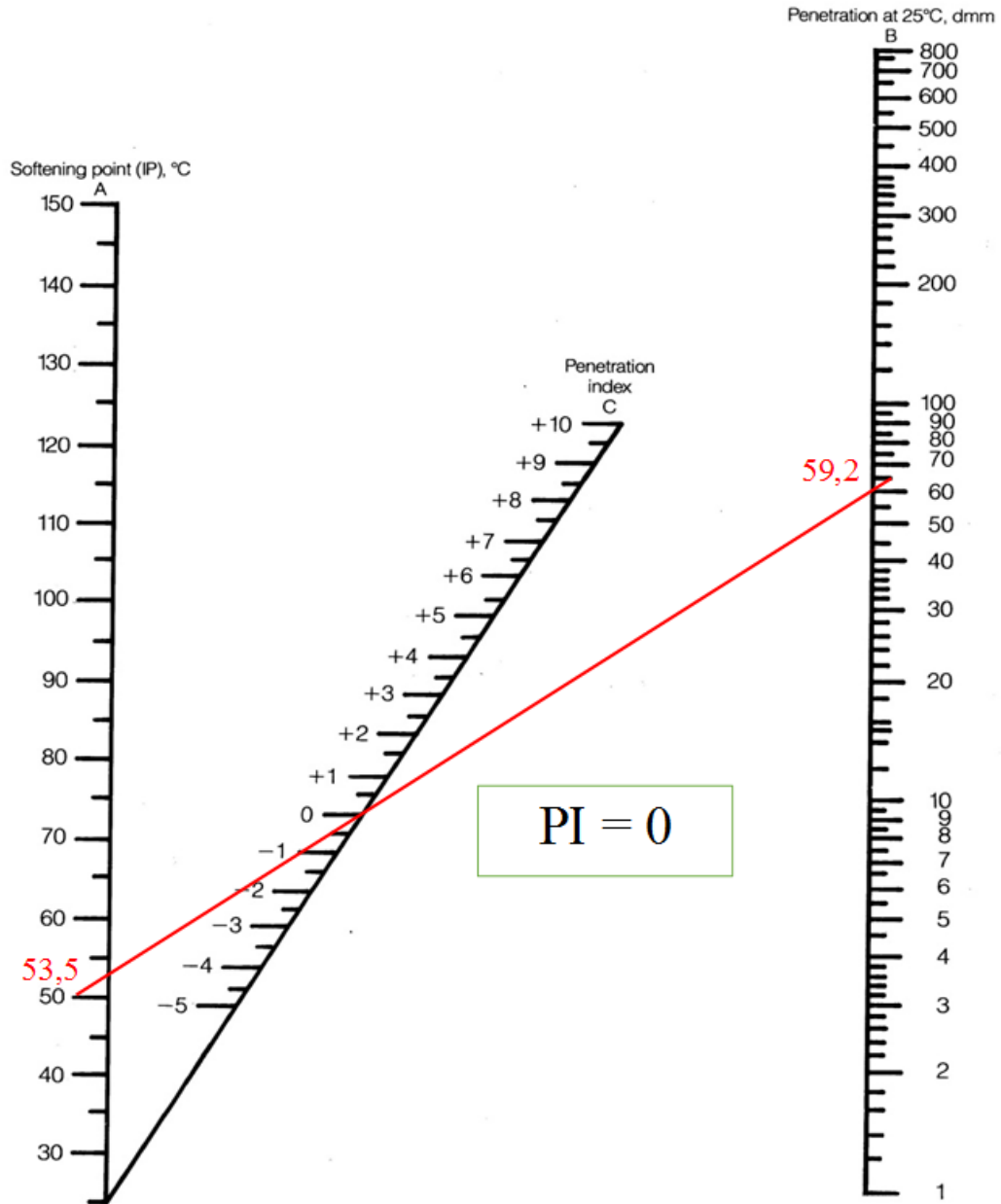
Keterangan :

- a = % aspal terhadap batuan
- b = % aspal terhadap Campuran
- c = Berat (gram)
- d = Berat dalam keadaan jenuh (gram)
- e = Berat dalam air (gram)
- f = Isi (ml) d-e
- g = berat isi benda uji = e/f
- h = berat jenis maksimum (teoritis) $100 / ((\% \text{ agregat} / \text{B.J. agregat}) + (\% \text{ aspal} / \text{B.J. aspal}))$
- i = $(b^3 \cdot g) / (B.J. \text{ aspal})$
- j = $(100 - b) / \text{B.J. agregat}$
- k = Jumlah kandungan rongga (%) = $100 - i - j$
- l = persen rongga terhadap agregat = $100 \cdot j$ (VMA)
- m = persen rongga terisi aspal = $100 \cdot i \cdot l$ (VFA)
- n = persen rongga terhadap campuran = $100 - 100 \cdot g / h$ (VIM)
- o = pembacaan arloji tekan
- p = angka korelasi
- q = stabilitas (0° kalibrasi alat)
- r = stabilitas (kg)
- s = alir / flow (mm)
- t = kekakuan / stiffness (kg/mm)

APPENDIX F1

NOMOGRAM TO DETERMINE OF NEAT BITUMEN+FELDSPAR 25%

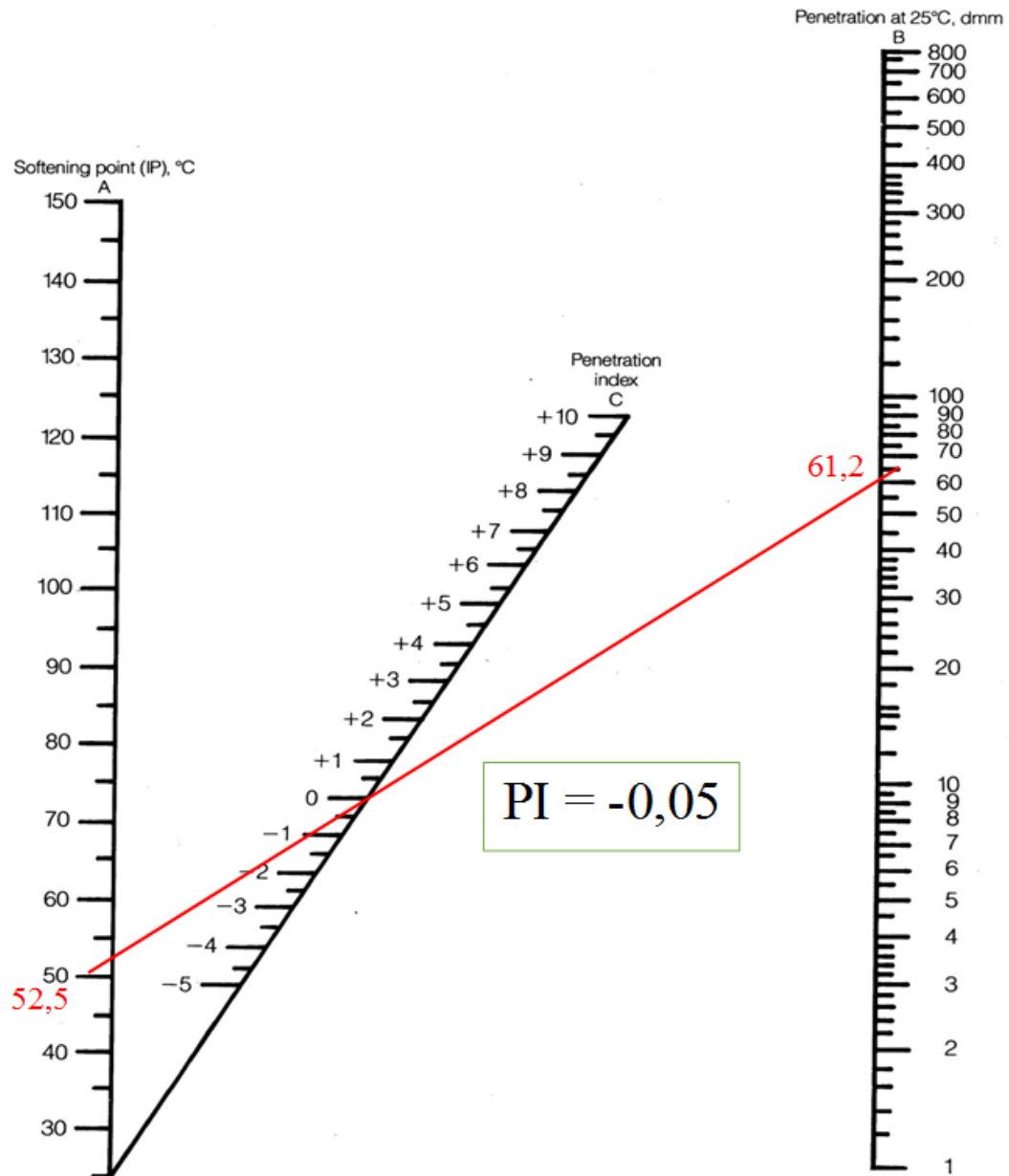
Draw a line between the softening point (line 'A') and penetration (line 'B') values. The intercept on line 'C' is the PI of the bitumen



APPENDIX F2

NOMOGRAM TO DETERMINE OF NEAT BITUMEN+FELDSPAR 20%

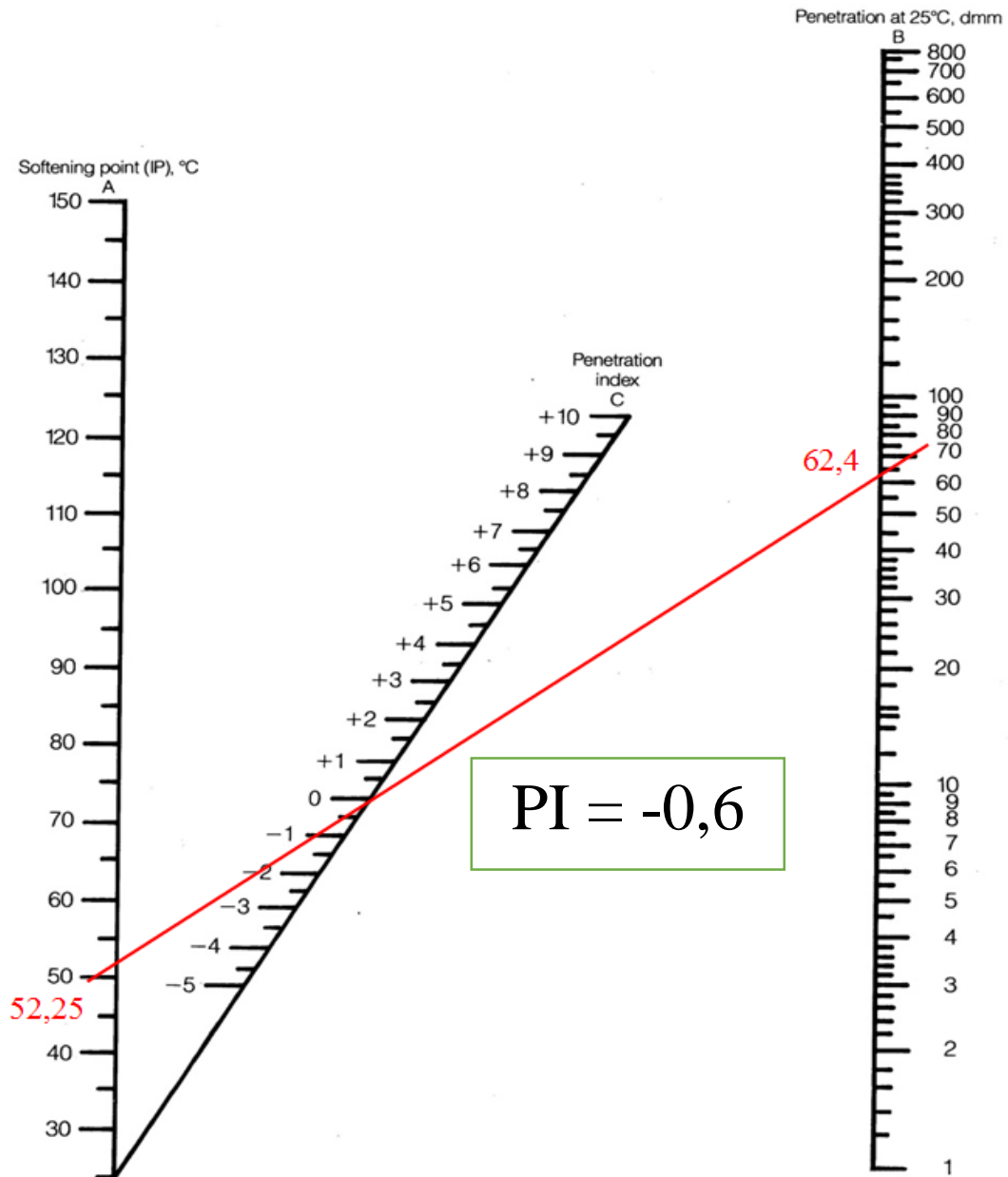
Draw a line between the softening point (line 'A') and penetration (line 'B') values. The intercept on line 'C' is the PI of the bitumen



APPENDIX F3

NOMOGRAM TO DETERMINE OF NEAT BITUMEN+FELDSPAR 15%

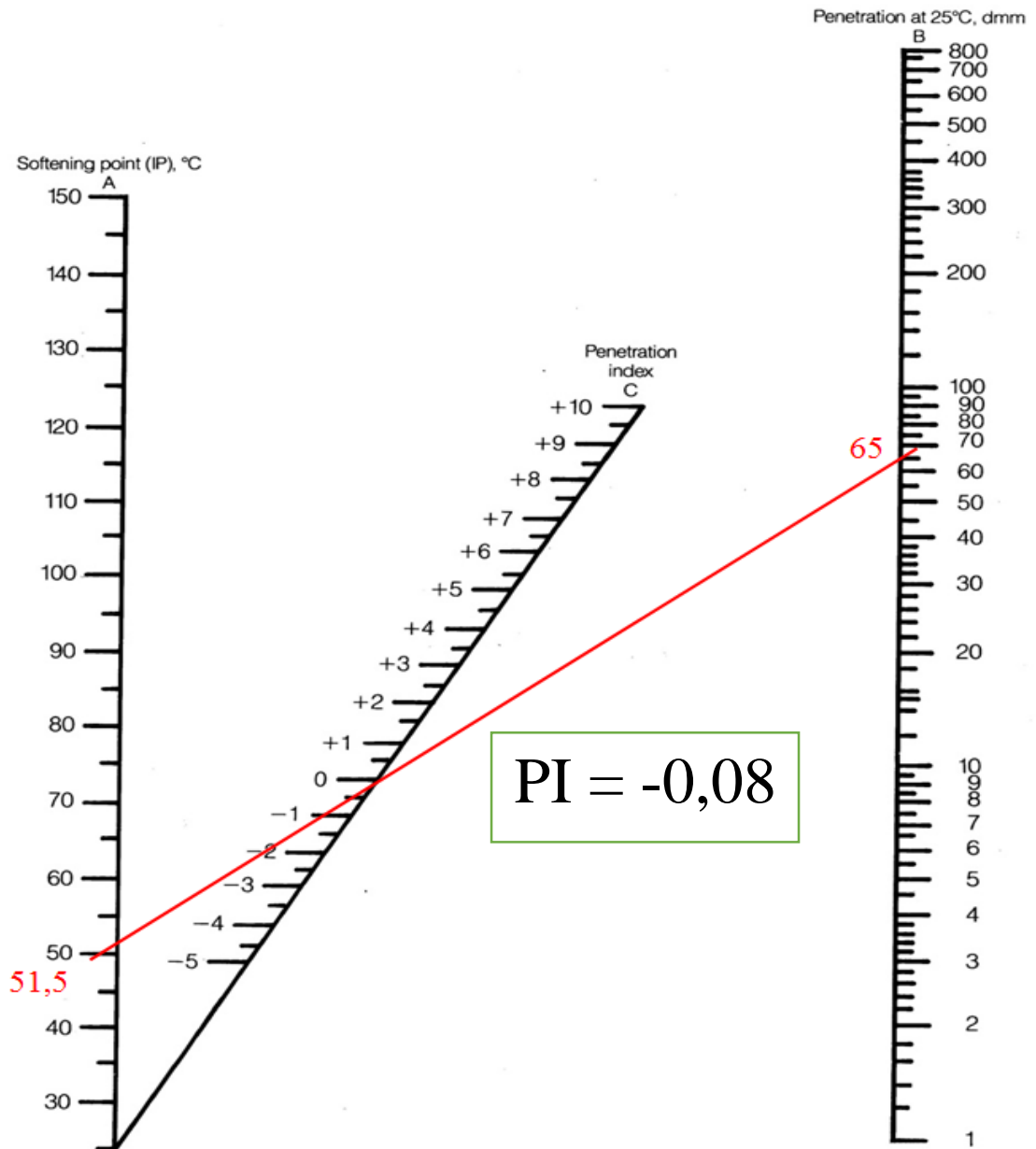
Draw a line between the softening point (line 'A') and penetration (line 'B') values. The intercept on line 'C' is the PI of the bitumen



APPENDIX F4

NOMOGRAM TO DETERMINE OF NEAT BITUMEN+FELDSPAR 10%

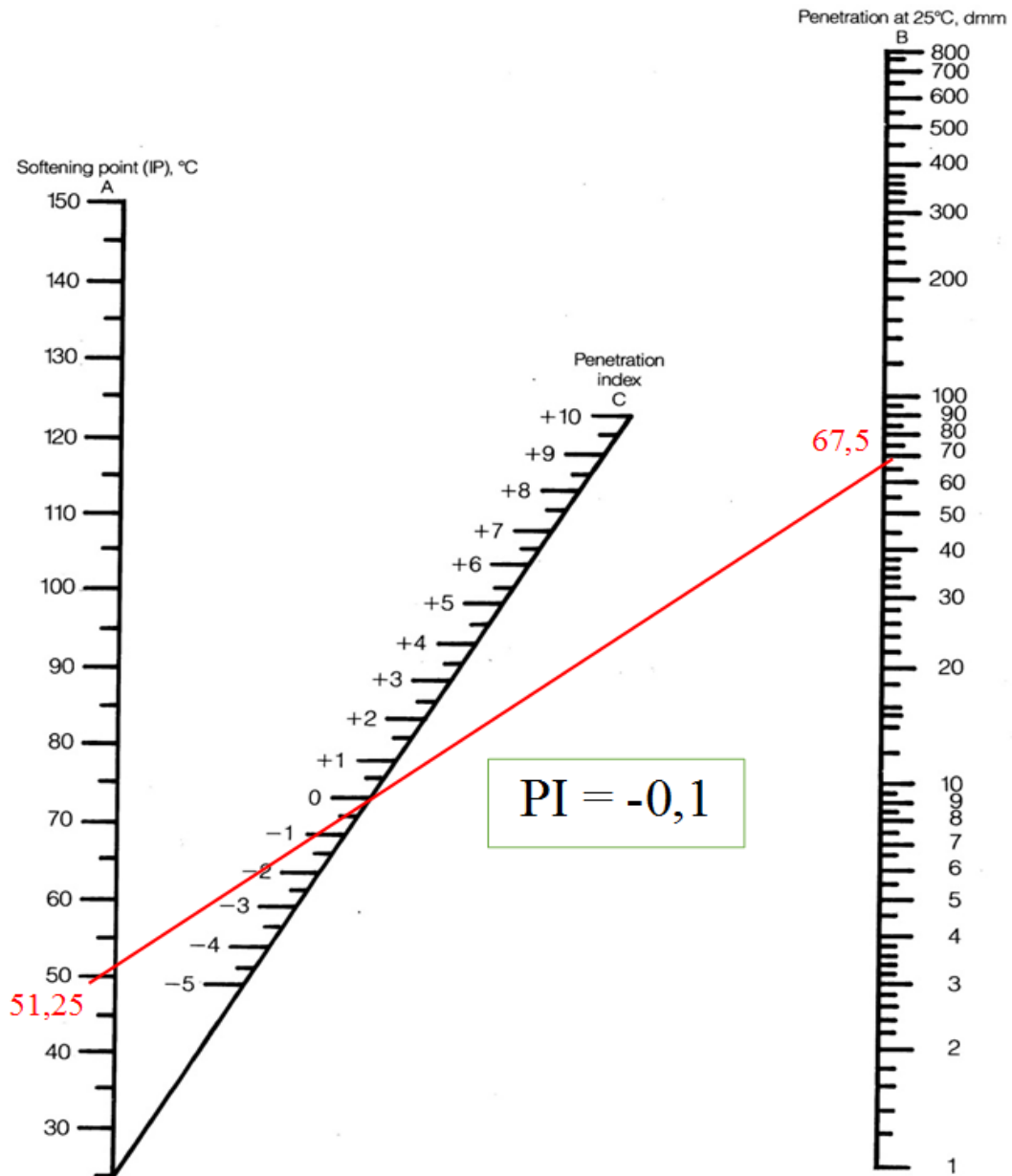
Draw a line between the softening point (line 'A') and penetration (line 'B') values. The intercept on line 'C' is the PI of the bitumen



APPENDIX F5

NOMOGRAM TO DETERMINE OF NEAT BITUMEN+FELDSPAR 5%

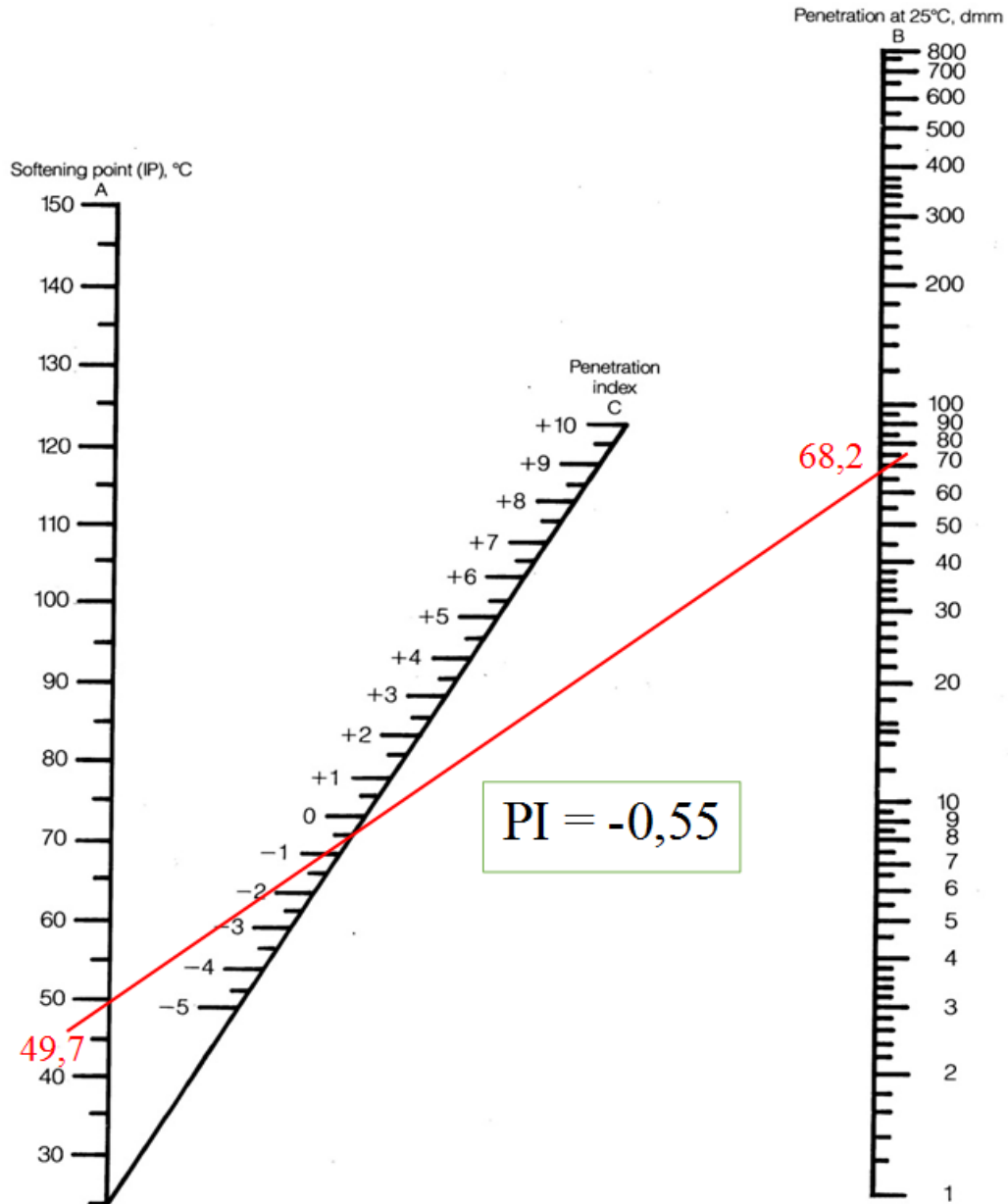
Draw a line between the softening point (line 'A') and penetration (line 'B') values. The intercept on line 'C' is the PI of the bitumen



APPENDIX F6

NOMOGRAM TO DETERMINE OF NEAT BITUMEN

Draw a line between the softening point (line 'A') and penetration (line 'B') values. The intercept on line 'C' is the PI of the bitumen



APPENDIX F7

NOMOGRAM TO DETERMINE OF STARBITUMEN

Draw a line between the softening point (line 'A') and penetration (line 'B') values. The intercept on line 'C' is the PI of the bitumen

