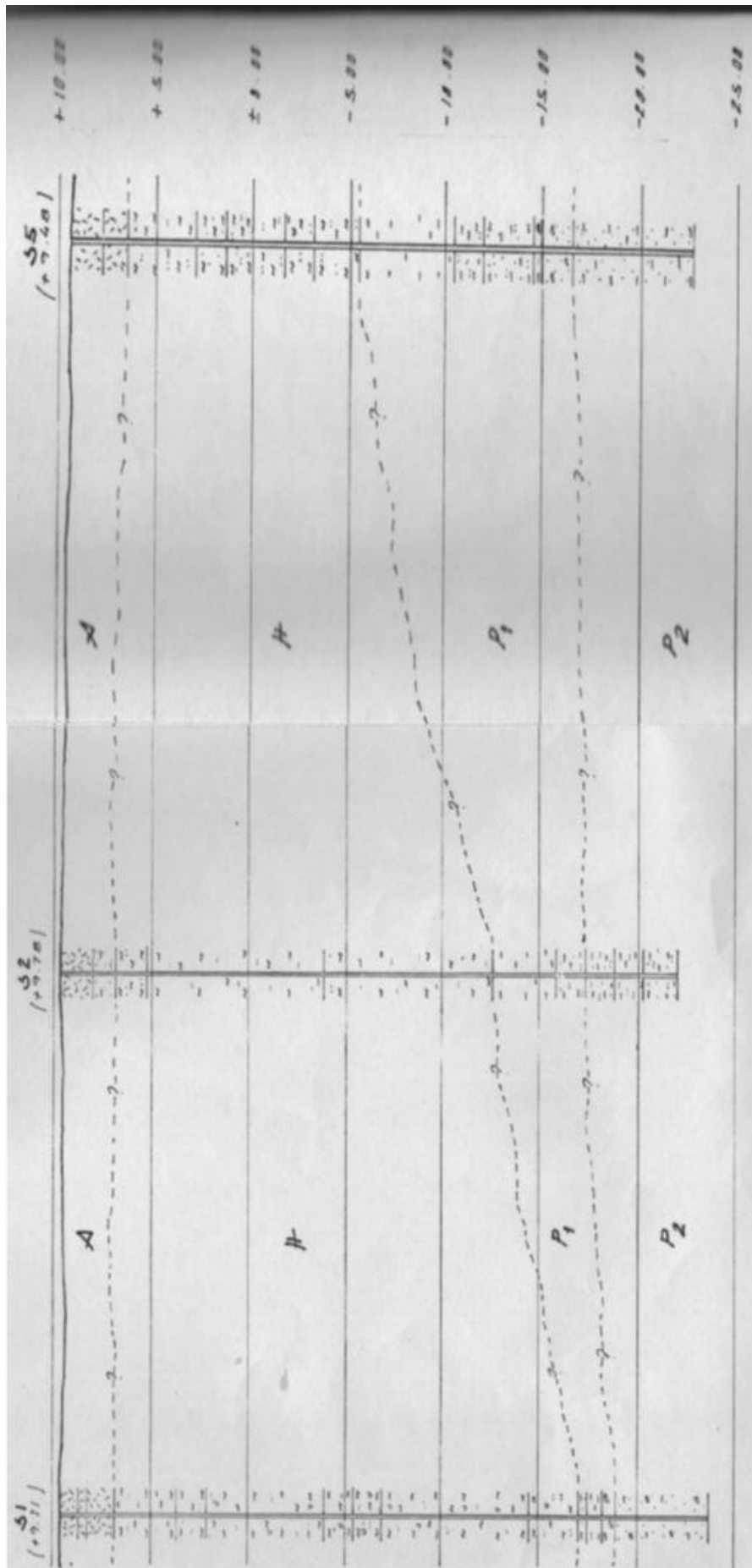






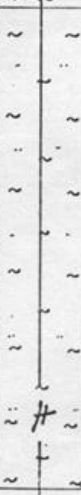

## **ANEXOS**

## ANEXO I

### Sondagens e corte geológico



Anexo I-3

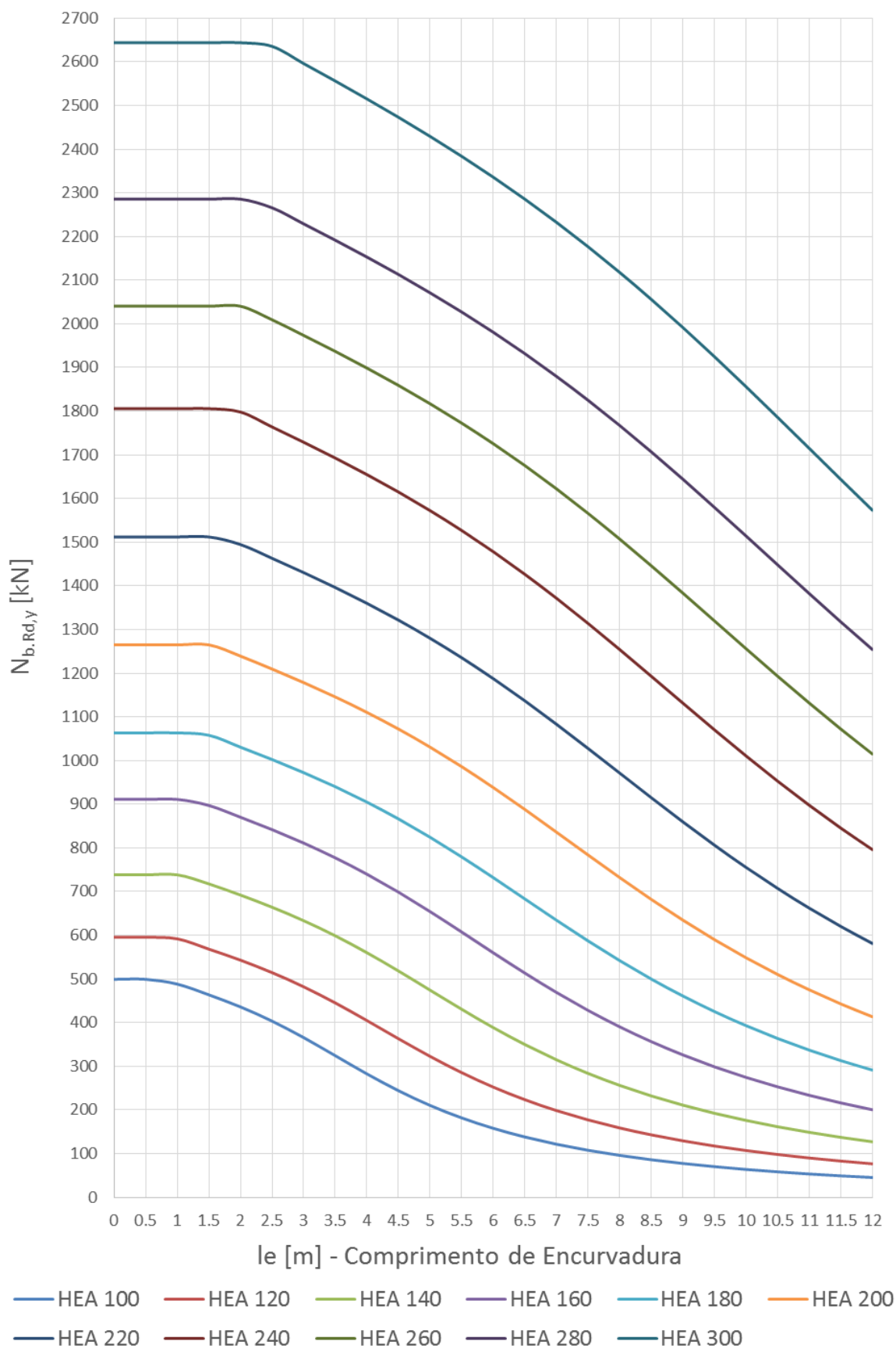
DESENHADO	<i>Lucy de F.</i>	CIMPOR, E. P. PROSPEÇÃO GEOT. P/ ESTUDO FUNDAÇÕES DE UM SILO P/ CIMENTO, 6000 M <sup>3</sup> . ALHANDRA IBRA-3538	CONSTRUÇÕES TÉCNICAS. S.A.								
VERIFICADO	<i>ADL.</i>		SERVICOS TÉCNICOS								
DATA	<i>98.12</i>		DESENHO N: <i>63725-M4</i>								
ESCALA	<i>1/100</i>	<b>GRÁFICO DA SONDAGEM N-2</b>									
SIMB.	Nº AMOSTRA	CLASSIFICAÇÃO DO TERRENO	ESP	PROF	COTA	N	ENSAIOS		DIVERSOS	A	
							Nº P/ncidas	Penetração (cm)			
					<i>0.00</i>	<i>+9.78</i>					
		<i>ATERRO ARENO-SILTO-PESELETOSSO, ACINZ.</i>	<i>1.70</i>								
				<i>-1.70</i>							
		<i>AREIA BASTANTE ARGILOSA COM SEIXO, ACIST. (ATERRO)</i>	<i>1.20</i>					<i>2</i>	<i>6</i>		
				<i>2.00</i>							
		<i>LOSSO SILTO-ARGILOSO, CAST-ESC. E CINZ.-ESC.</i>	<i>1.20</i>			<i>N.A.</i>		<i>1</i>	<i>4</i>		
				<i>2.90</i>							
		<i>LOSSO I SILTOSO, CINZ.-ESC.</i>									
				<i>3.00</i>							
				<i>4.50</i>					<i>0</i>	<i>(50 cm)</i>	
				<i>6.00</i>					<i>0</i>	<i>(60 cm)</i>	
				<i>7.50</i>					<i>0</i>	<i>(55 cm)</i>	
				<i>9.00</i>					<i>0</i>	<i>(65 cm)</i>	
				<i>10.50</i>					<i>0</i>	<i>(70 cm)</i>	
				<i>12.00</i>					<i>0</i>	<i>(45 cm)</i>	
				<i>13.50</i>					<i>0</i>	<i>(60 cm)</i>	
				<i>15.00</i>					<i>0</i>	<i>(55 cm)</i>	
		<i>LOSSO, POR VEZES LEVEM/ SILTOSO, CINZ.-ESC.</i>									
				<i>16.50</i>					<i>0</i>	<i>(60 cm)</i>	
				<i>18.00</i>					<i>0</i>	<i>(50 cm)</i>	
				<i>19.50</i>					<i>0</i>	<i>(55 cm)</i>	
				<i>21.00</i>					<i>0</i>	<i>(45 cm)</i>	
				<i>22.20</i>					<i>6</i>	<i>23</i>	
		<i>22.50</i>									

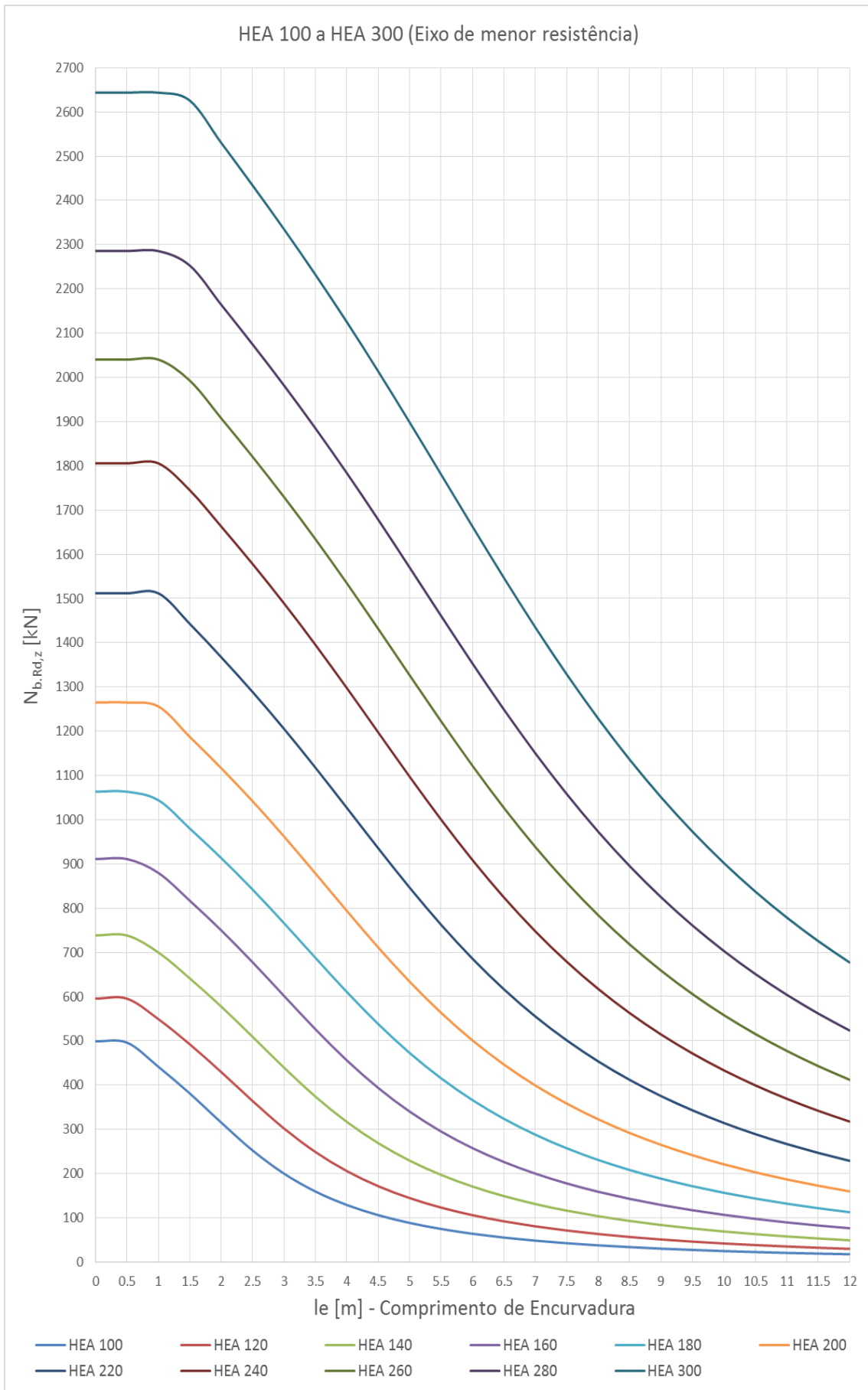
			22.20				
			22.50			6	23
P <sub>1</sub>	ARGILA, ESVERD.	3.30	24.00			8	29
			25.50			9	36
	ARGILA SILTOSA, UM POUCA ARENOSA, AMAREL.	1.50	27.00			20	60 (220cm)
	ARGILA SILTO-ARENOSA, ACINZ.	1.50	28.50			24	60 (250cm)
P <sub>2</sub>	LEM, ACINZ. E AMAREL.	1.50	30.00			25	60 (200cm)
	AREIA SILTO-ARGILOSA, AMAREL ACINZ.	1.84	31.50			27	60 (200cm)
			31.84				
<u>CONVENÇÕES</u>							
	A	- ACTUAL					
	H	- HOLOCÉNICO (QUATERNÁRIO)					
	P <sub>1</sub>	} PLIOCÉNICO					
	P <sub>2</sub>						
N.A.	NÍVEL AQUIFERO		A.	AMOSTRAS		PARA CONVENÇÕES VER DESENHO N.º	
M.	MOLINETE		I.	AMOSTRADOR DE TUBO ABERTO			
P.	PERMEABILIDADE		X.	AMOSTRADOR OSTERBERG			
			A.G.	ÁGUA SUBTERRÂNEA			

## ANEXO II

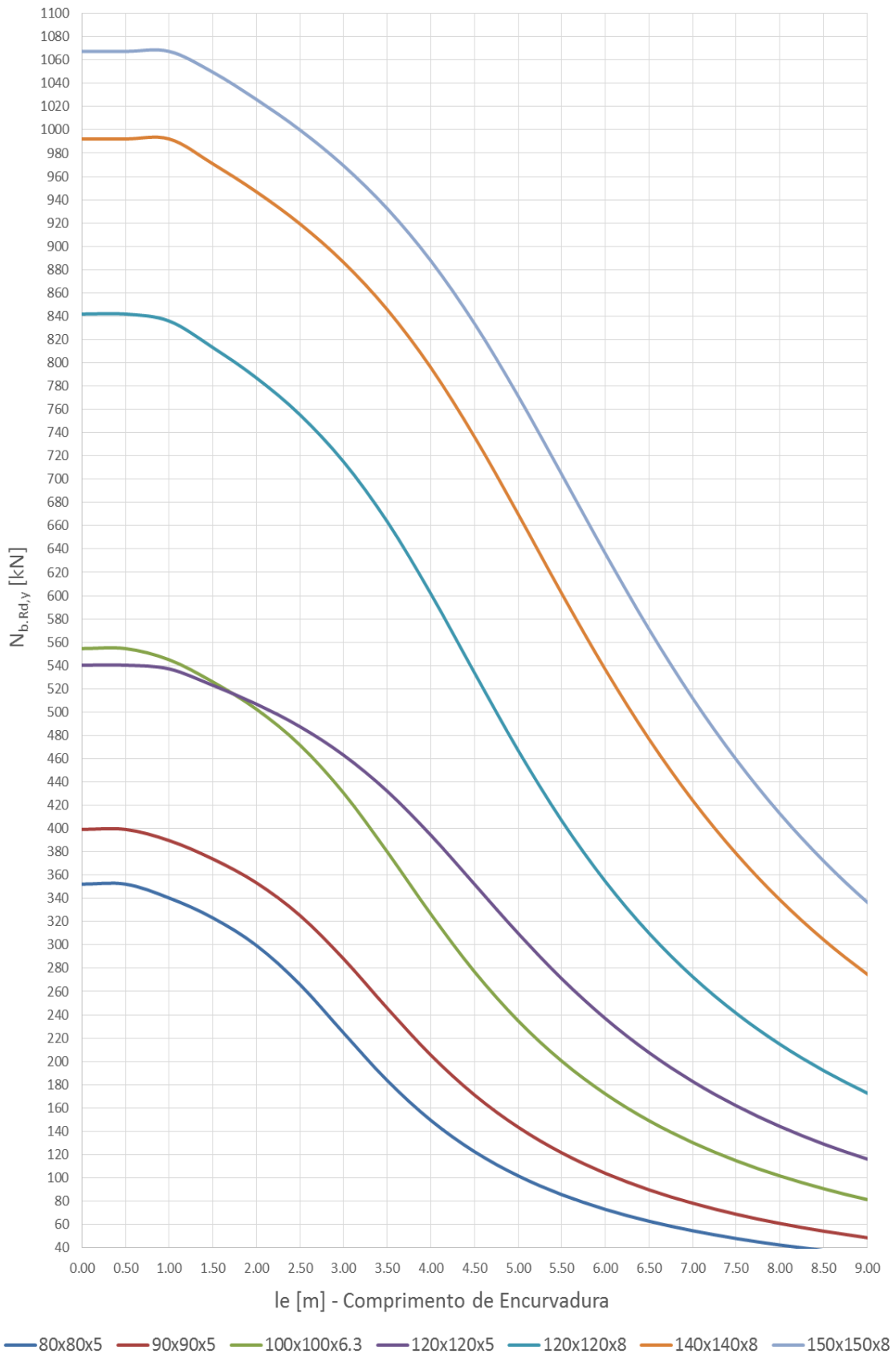
### Ábacos de Dimensionamento

HEA 100 a HEA 300 (Eixo de maior resistência)

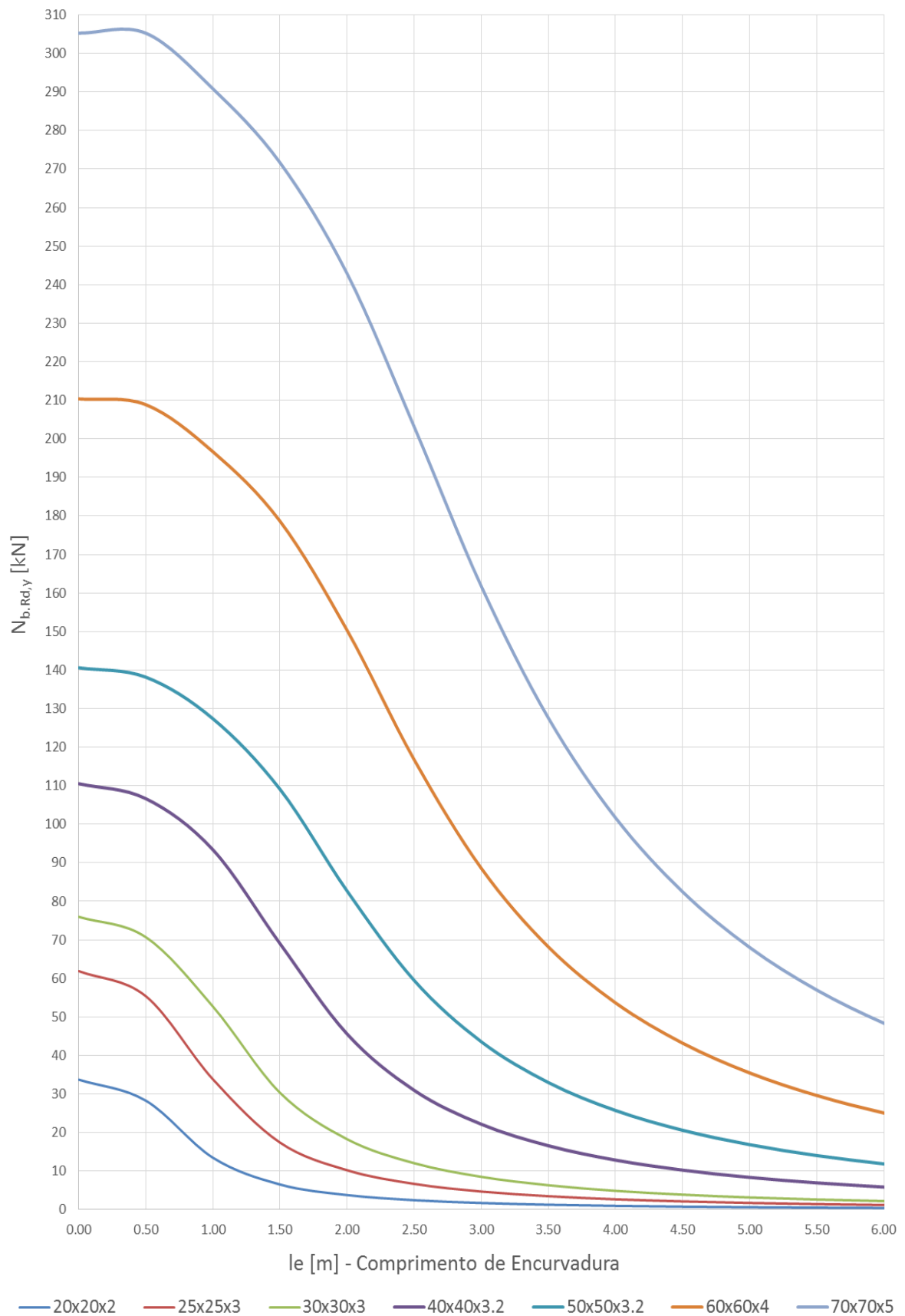




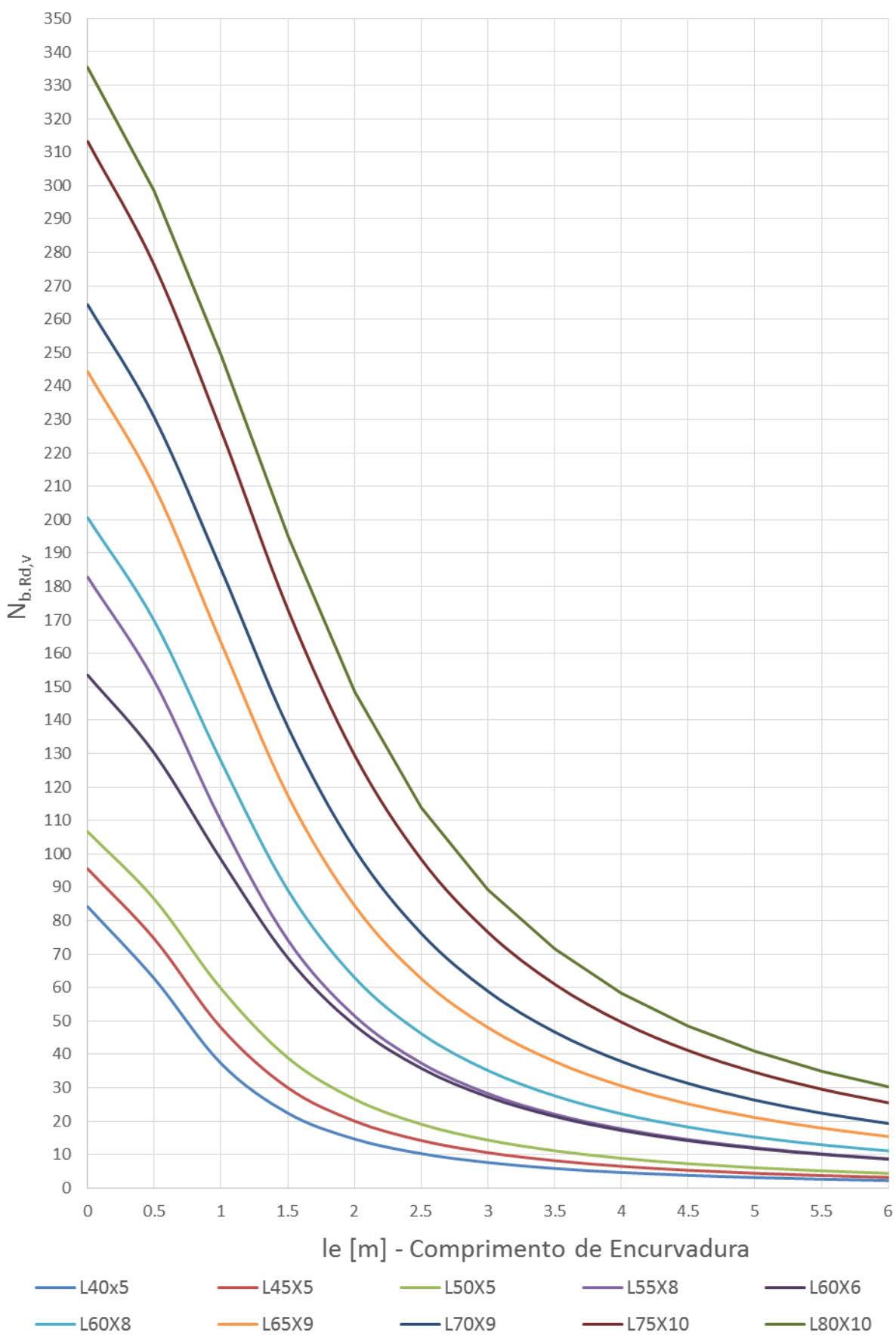
### $N_{b,rd}$ - Perfis Tubulares Quadrados



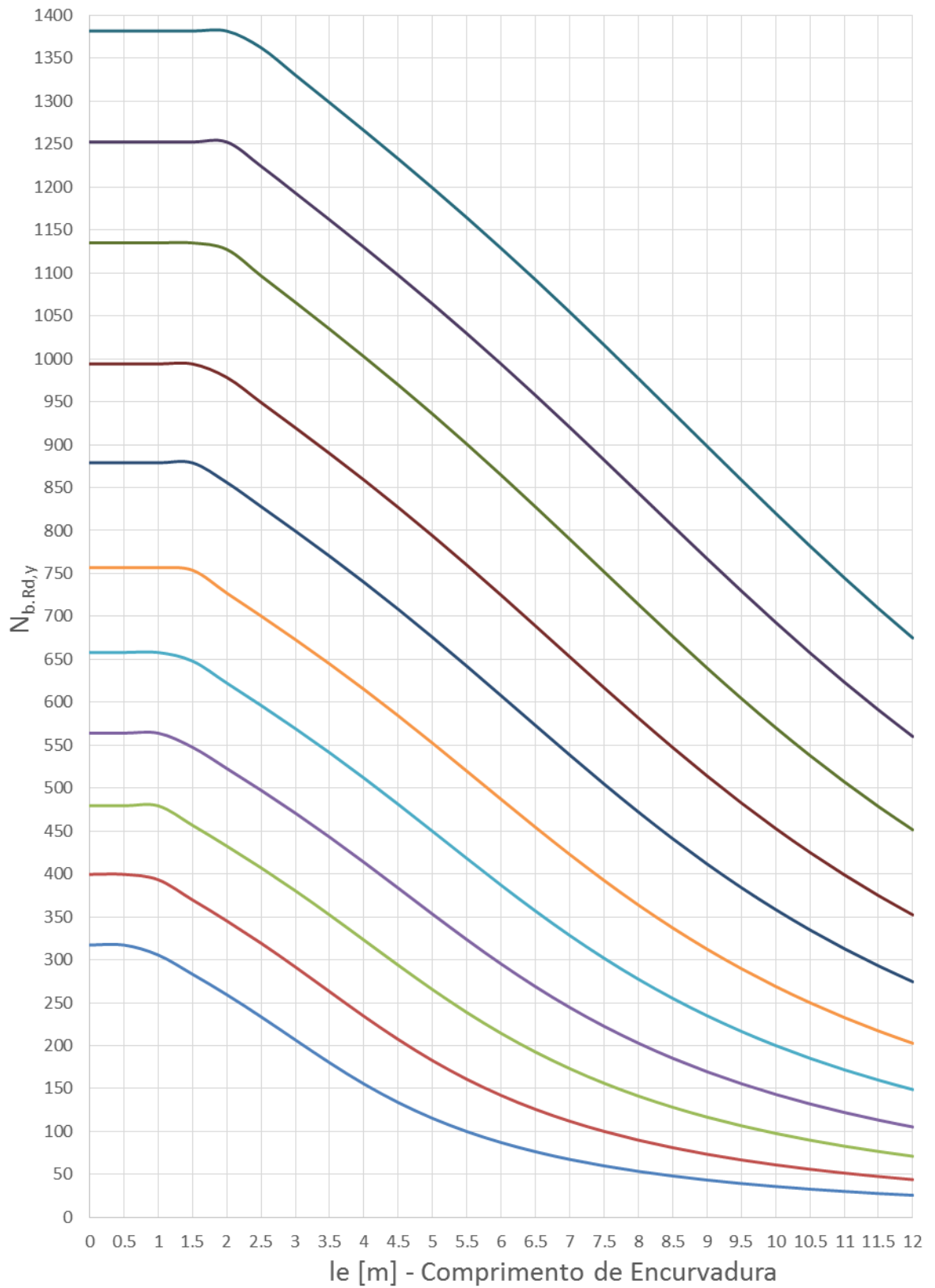
### $N_{b,rd}$ - Perfis Tubulares Quadrados



L 40x5 a L 80x10 (Eixo de menor resistência)

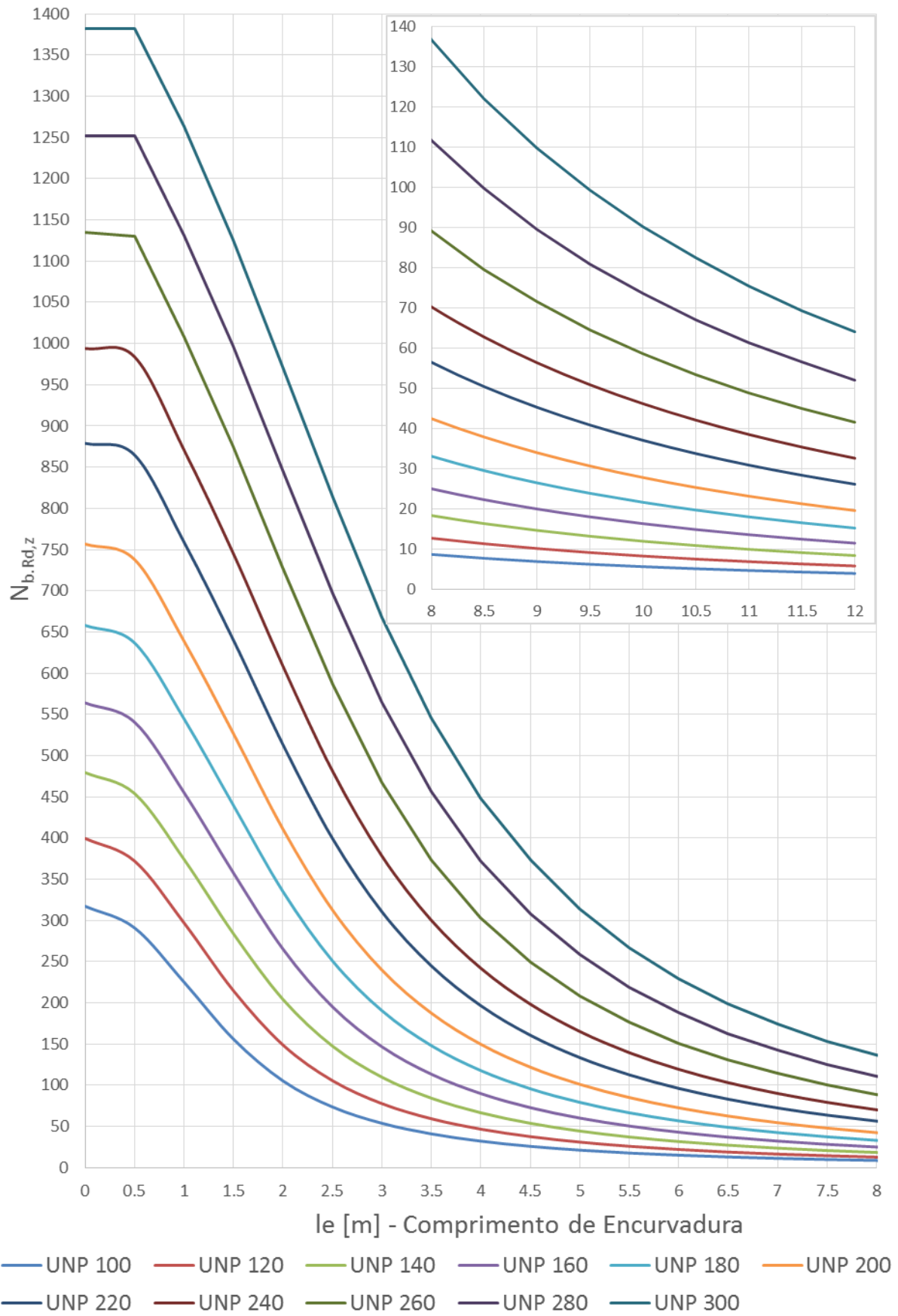


### UNP 100 a UNP 300 (Eixo de maior resistência)

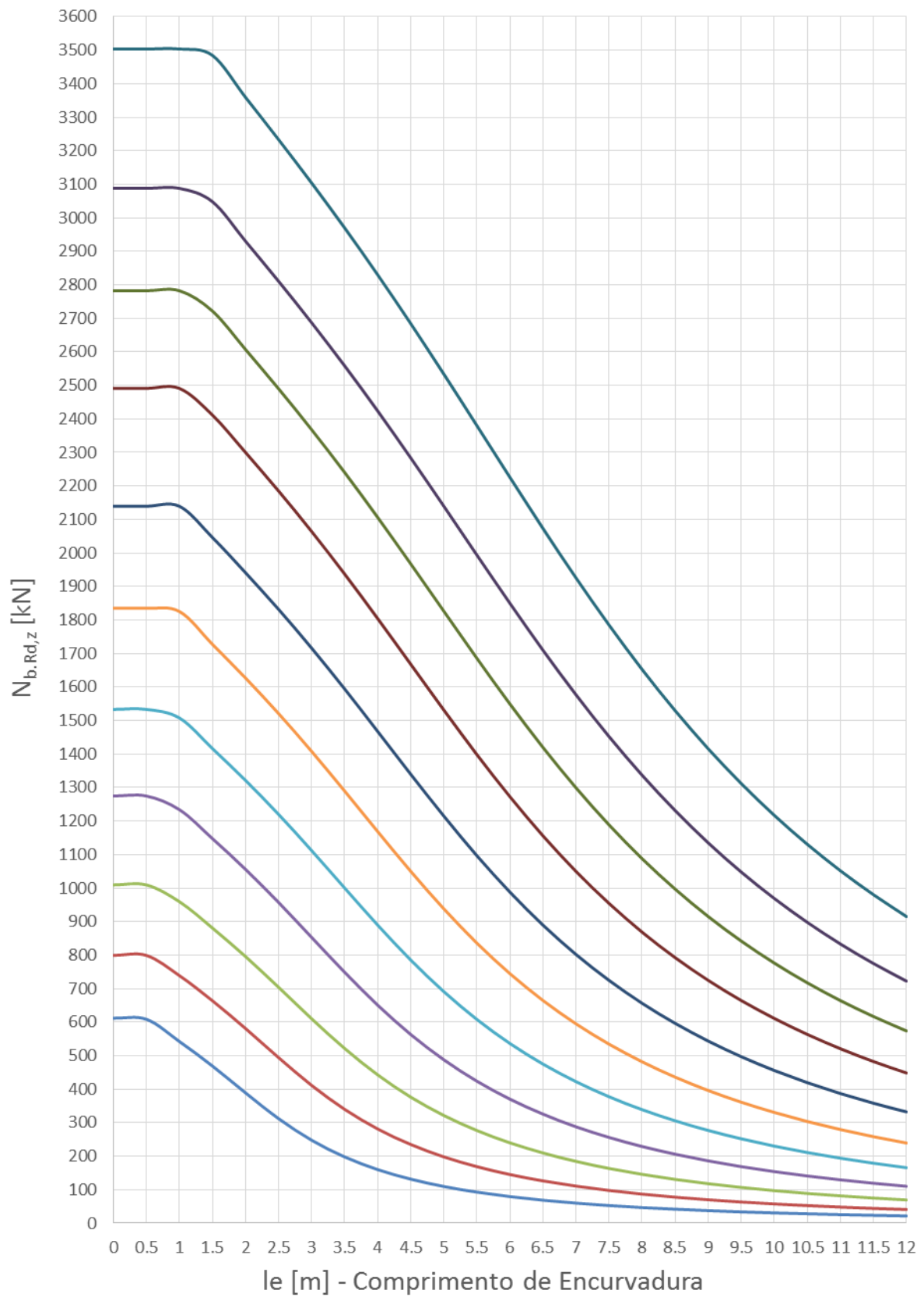


- UNP 100
- UNP 120
- UNP 140
- UNP 160
- UNP 180
- UNP 200
- UNP 220
- UNP 240
- UNP 260
- UNP 280
- UNP 300

### UNP 100 a UNP 300 (Eixo de menor resistência)



### HEB 100 a HEB 300 (Eixo de menor resistência)



- HEB 100
- HEB 120
- HEB 140
- HEB 160
- HEB 180
- HEB 200
- HEB 220
- HEB 240
- HEB 260
- HEB 280
- HEB 300

## ANEXO III

Relatório do *software LTBeam*

## ANEXO IV

Tabela de cálculo de elementos metálicos em *Excel*

## ANEXO V

Tabela com todos os rcios superiores a 0,5 dos elementos metlicos  
(*SAP2000*)

<b>TABLE: Steel Design 1 - Summary Data - Eurocode 3-2005</b>				
<b>Frame</b>	<b>DesignSect</b>	<b>Ratio</b>	<b>Combo</b>	<b>Location</b>
Text	Text	Unitless	Text	m
2755	L50X5	10.474	ELU.W <sub>x</sub> (T-)	3.18267
2795	L50X5	10.282	ELU.W <sub>x</sub> (T-)	3.18304
2754	L50X5	9.859	ELU.W <sub>x</sub> (T-)	3.08055
2794	L50X5	9.547	ELU.W <sub>x</sub> (T-)	1.54009
2752	L50X5	7.070	ELU.W <sub>xx</sub> (T-)	0
2792	L50X5	7.028	ELU.W <sub>xx</sub> (T-)	0
2753	L50X5	6.456	ELU.W <sub>xx</sub> (T-)	0
2793	L50X5	6.416	ELU.W <sub>xx</sub> (T-)	0
2807	L50X5	4.572	ELU.W <sub>xx</sub> (T+)	3.28394
2767	L50X5	4.571	ELU.W <sub>xx</sub> (T+)	3.28394
2811	L50X5	4.560	ELU.Cob(T+)	3.28394
2771	L50X5	4.513	ELU.Cob(T+)	3.28394
2790	L50X5	4.494	ELU.W <sub>yy1</sub> (T-)	0
2750	L50X5	4.431	ELU.W <sub>y1</sub> (T-)	0
2806	L50X5	4.426	ELU.W <sub>xx</sub> (T+)	3.28394
2766	L50X5	4.425	ELU.W <sub>xx</sub> (T+)	3.28394
2810	L50X5	4.420	ELU.Cob(T+)	3.28394
2770	L50X5	4.373	ELU.Cob(T+)	3.28394
2791	L50X5	4.161	ELU.W <sub>yy1</sub> (T-)	1.3296
2751	L50X5	4.101	ELU.W <sub>y1</sub> (T-)	1.3296
2757	L50X5	3.885	ELU.Cob(T-)	0
2756	L50X5	3.849	ELU.Cob(T-)	0
2797	L50X5	3.707	ELU.Cob(T-)	0
2796	L50X5	3.681	ELU.Cob(T-)	0
2809	L50X5	3.238	ELU.Cob(T+)	0
2769	L50X5	3.203	ELU.Cob(T+)	0
2808	L50X5	3.112	ELU.Cob(T+)	0
2768	L50X5	3.080	ELU.Cob(T+)	0
2764	L50X5	2.568	ELU.W <sub>xx</sub> (T+)	0
2804	L50X5	2.562	ELU.W <sub>xx</sub> (T+)	0
2765	L50X5	2.525	ELU.W <sub>xx</sub> (T+)	1.24014
2805	L50X5	2.519	ELU.W <sub>xx</sub> (T+)	1.24014
2772	L50X5	2.388	ELU.W <sub>xx</sub> (T-)	0
2812	L50X5	2.380	ELU.W <sub>xx</sub> (T-)	0
2773	L50X5	2.346	ELU.W <sub>xx</sub> (T-)	1.24014
2813	L50X5	2.339	ELU.W <sub>xx</sub> (T-)	1.24014
2748	L50X5	1.902	ELU.W <sub>x</sub> (T+)	3.19149
2749	L50X5	1.820	ELU.W <sub>x</sub> (T+)	3.08908
2759	L50X5	1.666	ELU.Cob(T-)	2.48028
2758	L50X5	1.617	ELU.Cob(T-)	2.48028
2799	L50X5	1.571	ELU.Cob(T-)	2.48028
2798	L50X5	1.523	ELU.Cob(T-)	2.48028

2789	L50X5	1.502	ELU.Wx(T+)	3.08877
2788	L50X5	1.487	ELU.Wx(T+)	1.59596
2775	L50X5	1.429	ELU.Wxx(T-)	2.48028
2815	L50X5	1.422	ELU.Wxx(T-)	2.48028
2816	L50X5	1.386	ELU.Wxx(T-)	0
2774	L50X5	1.378	ELU.Wxx(T-)	2.48028
2776	L50X5	1.371	ELU.Wxx(T-)	0
2814	L50X5	1.370	ELU.Wxx(T-)	2.48028
2817	L50X5	1.335	ELU.Wxx(T-)	0
2777	L50X5	1.319	ELU.Wxx(T-)	0
3551	IPE140	1.145	ELU.Wx(T-)	1.5
3575	IPE140	1.143	ELU.Wx(T-)	1.5
2472	IPE330	1.057	ELU.Wyy2(T+)	2.46
2480	IPE330	1.053	ELU.Wy2(T+)	2.46
6123	UPN160	1.038	ELU.Esc(T+.Wx)	0
6095	UPN160	1.036	ELU.Esc(T+.Wyy1)	0
2400	HE180A	1.033	ELU.Wyy2(T-)	0.04
6165	UPN160	1.019	ELU.Esc(T-.Wx)	0
3542	IPE140	1.012	ELU.Wx(T-)	0.5
3582	IPE140	1.003	ELU.Wx(T-)	0.5
3449	UPN120	1.003	ELU.Wyy2(T+)	0
6152	UPN160	0.988	ELU.Esc(T+.Wyy2)	0
6109	UPN160	0.984	ELU.Esc(T+.Wxx)	0
3518	Circ_0.016	0.976	ELU.Wyy2(T-)	0
3517	Circ_0.016	0.976	ELU.Wyy2(T-)	3.16218
3450	UPN120	0.968	ELU.Wy2(T+)	2
3525	Circ_0.016	0.960	ELU.Wy2(T-)	0
3524	Circ_0.016	0.960	ELU.Wy2(T-)	3.16218
6081	UPN160	0.956	ELU.Esc(T-.Wy1)	0
3534	IPE140	0.954	ELU.Wx(T-)	0.5
2922	IPE270	0.945	ELU.Wy2(T-)	0
3590	IPE140	0.930	ELU.Wx(T-)	0.5
2485	UPN200	0.924	ELU.Wyy1(T+)	0
781	UPN140	0.920	ELU.Wxx(T+)	4.44369
2324	UPN140	0.916	ELU.Wxx(T+)	4.44369
2151	IPE180	0.911	ELU.Wyy1(T+)	5.93666
2114	IPE400	0.908	ELU.Ponte(T-.Wyy1)	0
2158	IPE180	0.895	ELU.Wy1(T+)	5.93666
2194	UPN120	0.895	ELU.Wy2(T+)	0
2819	L50X5	0.894	ELU.Wx(T-)	2.48028
2507	UPN200	0.892	ELU.Wy1(T+)	0
3550	IPE140	0.879	ELU.Wx(T-)	0
1739	HE180A	0.877	ELU.Wyy1(T+)	0
3574	IPE140	0.876	ELU.Wx(T-)	0.5
2779	L50X5	0.875	ELU.Wx(T-)	2.48028

2341	HE180A	0.874	ELU.Wyy2(T+)	6.31
2994	IPE270	0.868	ELU.Wx(T-)	3.755
2763	L50X5	0.866	ELU.Wxx(T-)	2.48028
2803	L50X5	0.865	ELU.Wxx(T-)	2.48028
2531	IPE330-reinforced	0.859	ELU.Wyy1(T-)	2.246
2818	L50X5	0.846	ELU.Wx(T-)	2.48028
1558	HE180A	0.833	ELU.Wy1(T+)	0
3543	IPE140	0.831	ELU.Wx(T-)	2
2166	UPN120	0.827	ELU.Wy2(T-)	0
2778	L50X5	0.827	ELU.Wx(T-)	2.48028
3583	IPE140	0.824	ELU.Wx(T-)	2
2760	L50X5	0.823	ELU.Wxx(T-)	0
2800	L50X5	0.821	ELU.Wxx(T-)	0
2916	IPE270	0.820	ELU.Wx(T-)	3.754
2371	IPE240	0.816	ELU.Wx(T-)	3
3176	UPN120	0.814	ELU.Wx(T-)	0
2762	L50X5	0.814	ELU.Wxx(T-)	2.48028
2802	L50X5	0.813	ELU.Wxx(T-)	2.48028
2377	IPE330-reinforced	0.812	ELU.Wy1(T-)	2.246
2379	IPE330	0.806	ELU.Wyy1(T+)	0
1443	IPE240	0.804	ELU.Wyy1(T+)	2
2108	IPE330	0.800	ELU.Ponte(T+.Wx)	0
1510	HE140B	0.797	ELU.Wx(T-)	0
2455	IPE330	0.796	ELU.Wyy2(T+)	5.815
3280	UPN120	0.793	ELU.Wx(T+)	0
3248	UPN120	0.787	ELU.Wx(T+)	0
3535	IPE140	0.785	ELU.Wx(T-)	0
2152	IPE180	0.784	ELU.Wyy1(T-)	0
2159	IPE180	0.783	ELU.Wy1(T-)	0
860	HE180A	0.779	ELU.Wyy2(T+)	0.52
2928	UPN120	0.779	ELU.Wx(T-)	0
2725	HE120B	0.777	ELU.Wx(T-)	1.95714
1567	HE140B	0.774	ELU.Wxx(T-)	0
2545	IPE330	0.773	ELU.Wxx(T-)	0
3591	IPE140	0.773	ELU.Wx(T-)	0
2761	L50X5	0.772	ELU.Wxx(T-)	0
2801	L50X5	0.769	ELU.Wxx(T-)	0
2477	IPE330	0.768	ELU.Wy2(T+)	5.815
1568	HE140B	0.755	ELU.Wx(T-)	0
2211	UPN160	0.751	ELU.Wyy1(T-)	0
2362	IPE240	0.748	ELU.Wyy1(T-)	0
2540	IPE330	0.745	ELU.Wxx(T-)	2.75
3544	IPE140	0.745	ELU.Wx(T-)	0
3584	IPE140	0.738	ELU.Wx(T-)	0

2733	IPE180	0.736	ELU.Wxx(T+)	2.31818
2342	HE180A	0.736	ELU.Wxx(T-)	1.04
3249	UPN120	0.735	ELU.Wx(T+)	0
2884	UPN120	0.734	ELU.Wyy2(T+)	0
3598	IPE140	0.734	ELU.Wx(T-)	0
2270	UPN160	0.730	ELU.Wyy1(T-)	0
2372	IPE240	0.728	ELU.Wy1(T+)	0
1677	UPN160	0.726	ELU.Wyy2(T-)	0
2537	IPE270	0.725	ELU.Wyy2(T-)	0
3281	UPN120	0.722	ELU.Wx(T+)	0
2355	IPE240	0.721	ELU.Wy1(T-)	0
1509	HE140B	0.721	ELU.Wxx(T-)	0
2339	HE180A	0.721	ELU.Wy2(T-)	6.31
2391	HE180A	0.718	ELU.Wxx(T-)	1.04
858	HE180A	0.713	ELU.Wyy2(T+)	2.57778
2835	IPE180	0.711	ELU.Wxx(T+)	2.31818
1704	UPN160	0.710	ELU.Wyy1(T-)	0.3378
1473	IPE200	0.708	ELU.Wy2(T+)	0
2273	UPN160	0.708	ELU.Wy1(T-)	0.3378
3274	UPN120	0.707	ELU.Wx(T-)	3.375
2268	UPN160	0.706	ELU.Wyy1(T-)	0
3034	UPN120	0.705	ELU.Wx(T+)	0
3536	IPE140	0.699	ELU.Wx(T+)	0
2277	UPN160	0.699	ELU.Wy1(T-)	0.3378
2966	UPN120	0.697	ELU.Wx(T+)	3.375
3592	IPE140	0.697	ELU.Wyy1(T-)	0
2163	IPE180	0.696	ELU.Wyy1(T-)	5.04
2156	IPE180	0.693	ELU.Wy1(T-)	5.04
1701	UPN120	0.688	ELU.Wy2(T-)	0
2971	UPN120	0.687	ELU.Wx(T+)	0
834	HE180A	0.685	ELU.Wy2(T+)	0.52
2821	HE120B	0.682	ELU.Wx(T-)	1.95714
2275	UPN160	0.677	ELU.Wy1(T-)	0.3378
2262	Circ_0.02	0.674	ELU.Wy2(T-)	2
1707	UPN120	0.666	ELU.Wy2(T-)	0.24
2930	IPE270	0.661	ELU.Wx(T+)	0
1494	UPN120	0.657	ELU.Wyy2(T-)	0.24
2504	UPN200	0.656	ELU.Wyy1(T-)	0
2886	UPN120	0.655	ELU.Wyy2(T+)	0
1427	L60X8	0.649	ELU.Wyy1(T+)	1.56205
1447	IPE330	0.645	ELU.Wyy2(T-)	0
2382	IPE330	0.644	ELU.Wyy2(T-)	3.596
1430	L60X8	0.642	ELU.Wy1(T+)	1.56205
2279	UPN160	0.635	ELU.Wy1(T-)	0.3378
2205	Circ_0.02	0.634	ELU.Wyy2(T-)	2

3468	UPN120	0.633	ELU.Wy2(T-)	3.25
1472	IPE200	0.633	ELU.Wyy2(T+)	5.62
2837	IPE360	0.631	ELU.Pass(T-.Wyy1)	0
2880	UPN120	0.629	ELU.Wyy1(T+)	0
2482	UPN200	0.627	ELU.Wy1(T-)	0
5842	HE120A	0.622	ELU.Wyy1(T+)	4.16203
1425	L60X8	0.621	ELU.Wyy1(T+)	1.56205
1428	L60X8	0.619	ELU.Wy1(T+)	1.56205
3463	UPN120	0.617	ELU.Wyy2(T-)	0
2474	IPE330	0.616	ELU.Wxx(T+)	1.79665
3404	UPN120	0.615	ELU.Wyy2(T+)	0
3403	UPN120	0.615	ELU.Wyy2(T+)	3.25
3386	UPN120	0.614	ELU.Wyy2(T-)	0
3385	UPN120	0.614	ELU.Wyy2(T-)	3.25
3389	UPN120	0.610	ELU.Wy2(T-)	3.25
3390	UPN120	0.610	ELU.Wy2(T-)	0
1643	UPN140	0.609	ELU.Cob(T-)	0
2367	IPE240	0.604	ELU.Wyy2(T+)	0.985
2475	IPE330	0.603	ELU.Wxx(T+)	1.31
2452	IPE330	0.603	ELU.Wxx(T+)	1.79665
2375	IPE330	0.602	ELU.Wy2(T-)	3.596
3391	UPN120	0.601	ELU.Wyy2(T-)	3.25
3392	UPN120	0.601	ELU.Wyy2(T-)	0
1644	UPN140	0.599	ELU.Cob(T-)	9.7391
2453	IPE330	0.598	ELU.Wxx(T+)	1.31
2732	IPE180	0.598	ELU.Wxx(T+)	3.87692
3407	UPN120	0.597	ELU.Wy2(T+)	3.25
3408	UPN120	0.597	ELU.Wy2(T+)	0
3396	UPN120	0.595	ELU.Wy2(T-)	0
3395	UPN120	0.595	ELU.Wy2(T-)	3.25
2486	UPN200	0.594	ELU.Wyy1(T+)	0
2223	UPN120	0.592	ELU.Wy2(T+)	0
832	HE180A	0.588	ELU.Wy2(T+)	2.57778
1298	UPN120	0.588	ELU.Wxx(T+)	0
3566	IPE140	0.585	ELU.Wx(T-)	0
3558	IPE140	0.585	ELU.Wx(T-)	0
3539	IPE140	0.583	ELU.Wy1(T+)	1.8
3595	IPE140	0.582	ELU.Wyy1(T+)	1.8
5840	HE120A	0.581	ELU.Wy1(T+)	0
3596	IPE140	0.580	ELU.Wyy1(T+)	0
1646	UPN140	0.579	ELU.Cob(T-)	9.7391
1749	UPN160	0.578	ELU.Esc(T-.Wx)	0
2854	HE180A	0.578	ELU.Wx(T-)	0
3397	UPN120	0.577	ELU.Wyy2(T-)	3.25
3398	UPN120	0.577	ELU.Wyy2(T-)	0

2695	IPE330	0.577	ELU.Wyy1(T-)	0.3244
826	HE180A	0.576	ELU.Ponte(T+.Wx)	2.57778
1645	UPN140	0.575	ELU.Cob(T-)	0
2508	UPN200	0.575	ELU.Wy1(T+)	0.76667
1647	UPN140	0.574	ELU.Cob(T-)	0
3540	IPE140	0.574	ELU.Wy1(T+)	0
1648	UPN140	0.573	ELU.Cob(T-)	9.7391
2157	IPE180	0.573	ELU.Pass(T+.Wy1)	0
1306	UPN120	0.573	ELU.Wxx(T+)	0
2337	HE180A	0.571	ELU.Wyy2(T-)	3.745
2390	HE180A	0.571	ELU.Wy2(T-)	3.744
2852	HE180A	0.569	ELU.Wx(T-)	0
2694	IPE330	0.568	ELU.Wx(T+)	0.45
3402	UPN120	0.568	ELU.Wy2(T-)	0
3401	UPN120	0.568	ELU.Wy2(T-)	3.25
3332	UPN120	0.568	ELU.Wyy2(T+)	0
2603	TUBO_120.5	0.568	ELU.Cob(T+)	2.18782
3024	UPN120	0.567	ELU.Wx(T+)	0
2600	TUBO_120.5	0.565	ELU.Cob(T+)	0
3599	IPE140	0.564	ELU.Wx(T-)	0
6194	UPN160	0.562	ELU.Esc(T+.Wyy1)	0.0427
1543	UPN120	0.561	ELU.Wy2(T-)	0
2207	Circ_0.02	0.561	ELU.Wy2(T-)	2
2298	HE180A	0.558	ELU.Wyy1(T+)	0
2280	UPN160	0.557	ELU.Wyy1(T+)	0.3244
3252	UPN120	0.557	ELU.Wyy1(T-)	0
3251	UPN120	0.557	ELU.Wyy1(T-)	3.25
1696	UPN120	0.557	ELU.Wx(T+)	3.375
3448	UPN120	0.556	ELU.Wx(T+)	3.375
1348	UPN120	0.555	ELU.Wy1(T+)	0
1429	L60X8	0.554	ELU.Wyy1(T-)	1.56205
3433	UPN120	0.554	ELU.Wy2(T+)	3.25
3434	UPN120	0.554	ELU.Wy2(T+)	0
1679	UPN160	0.554	ELU.Wy1(T+)	0
1629	IPE100	0.553	ELU.Wyy1(T-)	0
3260	UPN120	0.553	ELU.Wy1(T+)	3.25
3261	UPN120	0.553	ELU.Wy1(T+)	0
2366	IPE240	0.552	ELU.Wx(T-)	3
2272	UPN160	0.551	ELU.Wyy1(T+)	0.3244
3593	IPE140	0.551	ELU.Wyy1(T-)	2.42857
2222	UPN120	0.550	ELU.Wy2(T+)	2.25
3526	IPE140	0.550	ELU.Wx(T-)	0
1641	UPN140	0.549	ELU.Cob(T-)	0
2699	IPE270	0.548	ELU.Wx(T-)	0
3537	IPE140	0.547	ELU.Wy1(T-)	2.42857

1631	IPE100	0.546	ELU.Wyy1(T-)	0
1637	IPE100	0.544	ELU.Pass(T+.Wxx)	0
1642	UPN140	0.544	ELU.Cob(T-)	9.7391
1633	IPE100	0.541	ELU.Pass(T+.Wxx)	0
2164	IPE180	0.541	ELU.Pass(T+.Wyy2)	3.6
1623	IPE100	0.540	ELU.Wy1(T-)	0
2696	IPE270	0.540	ELU.Wx(T+)	0
1751	UPN160	0.539	ELU.Esc(T+.Wx)	0
2263	Circ_0.02	0.535	ELU.Wyy2(T-)	2
2206	Circ_0.02	0.535	ELU.Wy2(T-)	2
3333	UPN120	0.534	ELU.Wx(T-)	3.375
2433	HE180A	0.534	ELU.Wyy1(T+)	0
1625	IPE100	0.533	ELU.Wy1(T-)	0
3362	UPN120	0.532	ELU.Wx(T-)	3.375
2484	UPN200	0.531	ELU.Wyy1(T+)	0
3289	UPN120	0.531	ELU.Wyy2(T+)	3.25
3330	UPN120	0.530	ELU.Wyy2(T+)	2.25
2370	IPE240	0.530	ELU.Wx(T-)	3
2961	UPN120	0.529	ELU.Wx(T+)	0
3290	UPN120	0.529	ELU.Wyy2(T-)	0
2942	UPN120	0.528	ELU.Wy1(T+)	0
2281	UPN160	0.527	ELU.Wy1(T-)	0.3378
1627	IPE100	0.527	ELU.Wyy1(T-)	0
3447	UPN120	0.527	ELU.Wyy1(T+)	0
1695	UPN120	0.526	ELU.Wy1(T+)	0
1397	UPN120	0.525	ELU.Wyy2(T+)	0
1624	IPE100	0.524	ELU.Wyy1(T+)	0
2506	UPN200	0.524	ELU.Wy1(T+)	0
1426	L60X8	0.523	ELU.Wy1(T-)	1.56205
3600	IPE140	0.523	ELU.Wx(T+)	2.46429
3288	UPN120	0.522	ELU.Wyy2(T-)	3.25
3151	UPN120	0.521	ELU.Wx(T-)	0
6178	UPN160	0.521	ELU.Esc(T-.Wyy2)	0.0427
2190	UPN120	0.520	ELU.Wy2(T+)	2.8
3361	UPN120	0.519	ELU.Wyy1(T+)	0
2271	UPN160	0.519	ELU.Wy1(T+)	0
1622	IPE100	0.518	ELU.Wyy1(T+)	0
2938	UPN120	0.517	ELU.Wy1(T+)	2.25
1621	IPE100	0.515	ELU.Wy1(T-)	0
3293	UPN120	0.514	ELU.Wy2(T-)	3.25
3294	UPN120	0.514	ELU.Wy2(T-)	0
1405	L60X8	0.513	ELU.Wyy1(T-)	1.56205
3552	IPE140	0.513	ELU.Cob(T+)	0
2264	Circ_0.02	0.512	ELU.Wyy2(T-)	2
3428	UPN120	0.512	ELU.Wy2(T-)	3.25

2834	IPE180	0.512	ELU.Wxx(T+)	3.87692
3576	IPE140	0.512	ELU.Cob(T+)	0
2045	HE180A	0.511	ELU.Wyy2(T+)	0
2689	IPE330	0.511	ELU.Wy1(T-)	0.6756
1189	IPE160	0.510	ELU.Temp+(Wyy1)	2
1630	IPE100	0.509	ELU.Wy1(T+)	0
3359	UPN120	0.509	ELU.Wyy1(T+)	2.25
2943	UPN120	0.509	ELU.Wx(T-)	3.375
3311	UPN120	0.508	ELU.Wyy2(T+)	2.8
3306	UPN120	0.507	ELU.Wyy2(T-)	2.8
2434	HE180A	0.506	ELU.Wyy1(T+)	0
3304	UPN120	0.505	ELU.Wyy2(T-)	2.8
3423	UPN120	0.505	ELU.Wyy2(T-)	0
1705	UPN120	0.504	ELU.Wxx(T+)	0
3310	UPN120	0.504	ELU.Wxx(T+)	0
1433	UPN120	0.503	ELU.Wxx(T+)	0
6147	IPE200	0.503	ELU.Esc(T-.Wx)	1.82833
3292	UPN120	0.503	ELU.Wy2(T+)	2
1628	IPE100	0.503	ELU.Wy1(T+)	0
2127	HE180A	0.502	ELU.Ponte(T+.Wx)	0.64444

## ANEXO VI

Relatório das Ligações (*Robot Structural Analysis Professional*)

## ANEXO VII

Relatórios do *GaLa Reinforcement*

## ANEXO VIII

Relatório da folha de cálculo do ELU-GEO das Estacas