



# **PREFEITURA MUNICIPAL DE TIGRINHOS**

**RODOVIA : ESTRADA MUNICIPAL**  
**TRECHO : SC-492 – BOM JESUS DO OESTE**

## **PROJETO DE ENGENHARIA RODOVIÁRIA PARA IMPLANTAÇÃO E PAVIMENTAÇÃO DA ESTRADA MUNICIPAL DE LIGAÇÃO DA SC-492 A BOM JESUS DO OESTE**

**IMPRESSÃO DEFINITIVA**

**VOLUME 1B – NOTAS DE SERVIÇO, ELEMENTOS DE  
LOCAÇÃO E CÁLCULO DE VOLUMES**

Empresa: **ENGMETRIA PROJETOS E LICENCIAMENTOS**

**SETEMBRO - 2021**

## SUMÁRIO

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# **CAPÍTULO 1 - APRESENTAÇÃO**

## A.1. APRESENTAÇÃO

O presente volume, intitulado **VOLUME 1B – NOTAS DE SERVIÇO, ELEMENTOS DE LOCAÇÃO E CÁLCULO DE VOLUMES**, é parte integrante do Projeto de Engenharia Rodoviária para Implantação e Pavimentação da Estrada Municipal, trecho: SC-492 – Bom Jesus do Oeste.

O projeto foi elaborado pela empresa **ENGMETRIA PROJETOS E LICENCIAMENTOS** em conformidade com o Contrato celebrado com a Prefeitura Municipal de Tigrinhos, cujos elementos principais estão relacionados a seguir.

**Número do Contrato : 027/2021**  
**Data de Assinatura do Contrato : 10/06/2021**  
**Prazo Contratual : 90 dias**

Integram o projeto os seguintes volumes:

**Volume 1 – Relatório do Projeto**, contém uma síntese dos estudos e projetos, informações gerais para os licitantes da obra e o plano de execução.

**Volume 1A – Estudos Geotécnicos**, contém os boletins de sondagem, os ensaios geotécnicos realizados e as sondagens mistas.

**Volume 1B – Notas de Serviço, Elementos de Locação e Cálculo de Volumes**, contém as notas de serviço de terraplenagem, os elementos para a locação da obra e o cálculo de volumes de terraplenagem.

**Volume 1C – Seções Transversais Gabaritadas**, contém as seções transversais gabaritadas de terraplenagem.

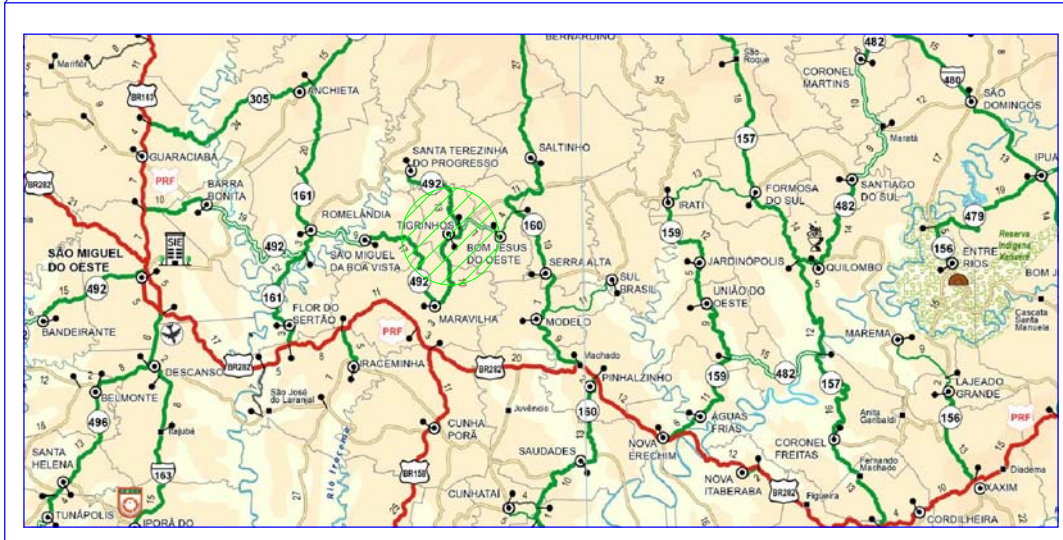
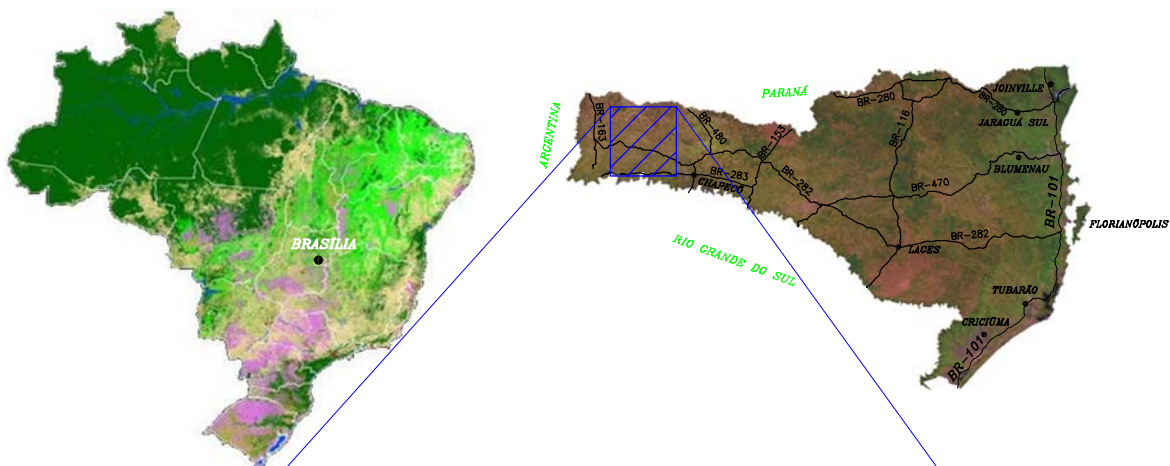
**Volume 2 – Projeto de Execução**, contém os desenhos relativos aos projetos, com os detalhes e informações necessárias à execução.

**Volume 3 – Orçamento**, contém a metodologia do orçamento, custos e cronograma da obra.

Florianópolis, setembro de 2021.



# PREFEITURA MUNICIPAL DE TIGRINHOS

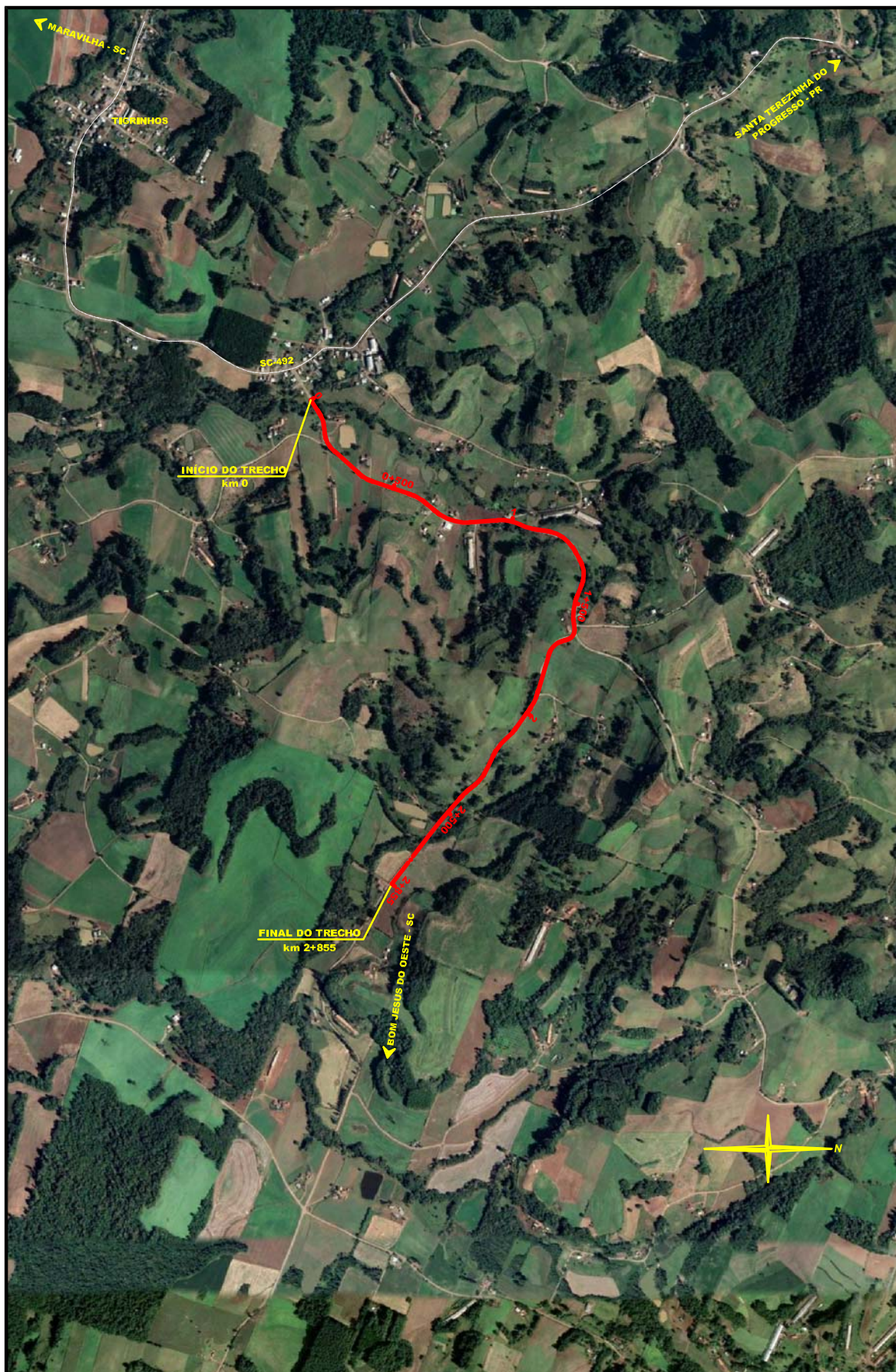


 TRECHO DO PROJETO

MAPA DE SITUAÇÃO

# MAPA DE LOCALIZAÇÃO

TRECHO: SC - 492 - BOM JESUS DO OESTE



## **CAPÍTULO 2 – MARCOS DE APOIO**



**ENGMETRIA - Ltda.****Projeto: Tigrinhos - SC****MARCOS DE APOIO****Coordenadas**

Meridiano	Datum
-51°00'00"	SIRGAS2000

Nome	Descrição	Norte	Este	Altitude
M2	Marco	7.047.785,5140	287.428,4180	640,850
M1	Marco	7.047.047,3499	286.964,4948	615,174
M3	Marco	7.048.007,8989	287.892,8938	708,467

## **CAPÍTULO 3 – NOTAS DE SERVIÇO DE TERRAPLENAGEM**

Estaca	Lado Esquerdo						Eixo						Lado Direito														
	Offset			Lateral			Bordo			Cota			Cota Vermelha			Bordo			Lateral			Offset					
	Altura	Cota	Distância	Cota	Distância	%	Cota	Terreno	Projeto	Cota	%	Distância	Cota	Vermelha	%	Distância	Cota	Distância	Cota	Distância	Cota	Distância	Cota	Distância	Cota	Distância	Cota
0	0,410	614,844	-4,910	614,434	-4,500	-2,50	614,897	614,547	0,350	-2,50	3,000	614,472	614,472	0,350	-2,50	3,000	614,434	4,500	614,434	5,000	614,934	0,500					
0+10,000	0,428	614,748	-4,928	614,320	-4,500	-2,50	614,782	614,432	0,350	-2,50	3,000	614,357	614,357	0,350	-2,50	3,000	614,320	4,500	614,320	4,585	614,405	0,085					
0+20	0,282	614,651	-4,782	614,369	-4,500	-1,05	614,743	614,417	0,326	-2,50	3,000	614,385	614,385	0,326	-2,50	3,000	614,304	4,500	614,304	4,995	614,799	0,495					
0+40	0,136	615,202	-4,636	615,066	-4,500	1,85	615,195	614,983	0,212	-2,50	3,000	615,038	615,038	0,212	-2,50	3,000	614,908	4,500	614,870	5,107	615,477	0,607					
0+44,483	0,328	615,660	-4,828	615,332	-4,500	2,50	615,603	615,219	0,384	-2,50	3,000	615,294	615,294	0,384	-2,50	3,000	615,144	4,500	615,107	5,230	615,837	0,730					
0+50	0,527	616,216	-5,027	615,689	-4,500	2,78	616,150	615,564	0,586	-2,78	3,000	615,648	615,648	0,586	-2,78	3,000	615,440	4,500	615,440	5,334	616,274	0,834					
0+60	0,801	617,293	-5,301	616,492	-4,500	3,28	617,183	616,345	0,838	-3,28	3,000	616,443	616,443	0,838	-3,28	3,000	616,198	4,500	616,198	5,439	617,137	0,939					
0+70	1,002	618,397	-5,502	617,395	-4,500	3,78	618,216	617,225	0,991	-3,78	3,000	617,338	617,338	0,991	-3,78	3,000	617,112	4,500	617,055	6,165	618,719	1,664					
0+74,483	1,030	618,830	-5,530	617,800	-4,500	4,00	618,659	617,620	1,039	-4,00	3,000	617,740	617,740	1,039	-4,00	3,000	617,500	4,500	617,440	7,417	620,357	2,917					
0+80	0,851	619,136	-5,351	618,285	-4,500	4,00	619,049	618,105	0,944	-4,00	3,000	618,225	618,225	0,944	-4,00	3,000	617,985	4,500	617,925	6,861	620,286	2,361					
0+90	0,876	620,041	-5,377	619,165	-4,500	4,00	619,684	618,985	0,699	-4,00	3,000	619,105	619,105	0,699	-4,00	3,000	618,865	4,500	618,805	5,902	620,207	1,402					
0+100	0,599	620,644	-5,099	620,045	-4,500	4,00	620,363	619,865	0,498	-4,00	3,000	619,985	619,985	0,498	-4,00	3,000	619,745	4,500	619,685	5,338	620,523	0,838					
0+100,703	0,559	620,666	-5,059	620,107	-4,500	4,00	620,407	619,927	0,480	-4,00	3,000	620,047	620,047	0,480	-4,00	3,000	619,807	4,500	619,747	5,299	620,546	0,799					
0+110	0,410	621,279	-4,910	620,869	-4,500	2,76	620,952	620,745	0,207	-2,76	3,000	620,828	620,828	0,207	-2,76	3,000	620,662	4,500	620,621	4,796	620,917	0,296					
0+120	-0,096	621,593	-4,645	621,689	-4,500	1,43	621,375	621,625	-0,250	-1,43	3,000	621,668	621,668	-0,250	-1,43	3,000	621,582	4,500	621,561	4,633	621,472	-0,089					
0+130	-0,262	622,247	-4,893	622,509	-4,500	0,09	621,987	622,505	-0,518	-0,09	3,000	622,508	622,508	-0,518	-0,09	3,000	622,502	4,500	622,501	5,078	622,116	-0,385					
0+130,703	-0,274	622,293	-4,911	622,567	-4,500	0,00	622,031	622,567	-0,536	0,00	3,000	622,567	622,567	-0,536	0,00	3,000	622,567	4,500	622,567	5,114	622,158	-0,409					
0+135	-0,344	622,578	-5,016	622,922	-4,500	-0,51	622,301	622,945	-0,644	0,51	3,000	622,930	622,930	-0,644	0,51	3,000	622,960	4,500	622,968	5,325	622,418	-0,550					
0+140	-0,262	623,074	-4,894	623,336	-4,500	-1,09	622,804	623,385	-0,581	1,09	3,000	623,352	623,352	-0,581	1,09	3,000	623,418	4,500	623,434	5,461	622,794	-0,640					
0+145	-0,166	623,583	-4,750	623,749	-4,500	-1,68	623,310	623,825	-0,515	1,68	3,000	623,775	623,775	-0,515	1,68	3,000	623,875	4,500	623,901	5,588	623,176	-0,725					
0+150	-0,037	624,126	-4,556	624,163	-4,500	-2,27	623,819	624,265	-0,446	2,27	3,000	624,197	624,197	-0,446	2,27	3,000	624,333	4,500	624,367	5,764	623,525	-0,842					
0+155	0,556	625,118	-5,056	624,562	-4,500	-2,86	624,344	624,690	-0,346	2,86	3,000	624,604	624,604	-0,346	2,86	3,000	624,776	4,500	624,819	5,666	624,042	-0,777					
0+160	0,774	625,705	-5,274	624,931	-4,500	-3,45	624,883	625,086	-0,203	3,45	3,000	624,982	624,982	-0,203	3,45	3,000	625,189	4,500	625,241	5,596	624,511	-0,730					
0+164,713	0,725	625,976	-5,225	625,251	-4,500	-4,00	625,379	625,431	-0,052	4,00	3,000	625,311	625,311	-0,052	4,00	3,000	625,551	4,500	625,611	4,996	625,280	-0,331					
0+165	0,710	625,982	-5,210	625,272	-4,500	-4,00	625,409	625,452	-0,043	4,00	3,000	625,332	625,332	-0,043	4,00	3,000	625,572	4,500	625,632	4,921	625,351	-0,281					
0+170	0,429	626,037	-4,930	625,608	-4,500	-4,00	625,826	625,788	0,038	4,00	3,000	625,668	625,668	0,038	4,00	3,000	625,908	4,500	625,968	4,501	625,967	-0,001					
0+175	0,093	626,007	-4,593	625,914	-4,500	-4,00	626,128	626,094	0,034	4,00	3,000	625,974	625,974	0,034	4,00	3,000	626,214	4,500	626,274	4,704	626,478	0,204					
0+180	-0,462	625,729	-5,192	626,191	-4,500	-4,00	626,628	626,371	0,257	4,00	3,000	626,251	626,251	0,257	4,00	3,000	626,491	4,500	626,551	4,820	626,871	0,320					

Estaca	Lado Esquerdo						Eixo						Lado Direito															
	Offset			Lateral			Bordo			Cota			Vermelha			Bordo			Lateral			Offset						
	Altura	Cota	Distância	Cota	Distância	%	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância	%			
0+185	-0,728	625,711	-5,593	626,439	-4,500	-3,000	626,499	-4,00	627,002	626,619	0,383	4,00	3,000	626,739	4,500	626,799	4,835	627,002	626,619	0,383	4,00	3,000	626,739	4,500	626,799	4,835	627,134	0,335
0+190	-0,967	625,689	-5,951	626,656	-4,500	-3,000	626,716	-4,00	627,122	626,836	0,286	4,00	3,000	626,956	4,500	627,016	4,890	627,122	626,836	0,286	4,00	3,000	626,956	4,500	627,016	4,890	627,406	0,390
0+195	-1,299	625,545	-6,449	626,844	-4,500	-3,000	626,904	-4,00	627,425	627,024	0,401	4,00	3,000	627,144	4,500	627,204	4,864	627,425	627,024	0,401	4,00	3,000	627,144	4,500	627,204	4,864	627,568	0,364
0+197,937	-1,310	625,631	-6,465	626,941	-4,500	-3,000	627,001	-3,000	627,322	627,121	0,201	4,00	3,000	627,241	4,500	627,301	4,819	627,322	627,121	0,201	4,00	3,000	627,241	4,500	627,301	4,819	627,620	0,319
0+200	-1,285	625,722	-6,427	627,007	-4,500	-3,000	627,066	-3,000	627,156	627,183	-0,027	3,90	3,000	627,300	4,500	627,358	4,739	627,156	627,183	-0,027	3,90	3,000	627,300	4,500	627,358	4,739	627,597	0,239
0+205	-1,293	625,854	-6,439	627,147	-4,500	-3,000	627,202	-3,000	627,132	627,312	-0,180	3,65	3,000	627,421	4,500	627,476	4,570	627,132	627,312	-0,180	3,65	3,000	627,421	4,500	627,476	4,570	627,429	-0,047
0+210	-1,773	625,485	-7,160	627,258	-4,500	-3,000	627,309	-3,000	627,137	627,411	-0,274	3,40	3,000	627,513	4,500	627,564	4,741	627,137	627,411	-0,274	3,40	3,000	627,513	4,500	627,564	4,741	627,403	-0,161
0+215	-2,575	624,764	-8,363	627,339	-4,500	-3,000	627,386	-3,000	627,101	627,480	-0,379	3,15	3,000	627,575	4,500	627,622	5,090	627,101	627,480	-0,379	3,15	3,000	627,575	4,500	627,622	5,090	627,229	-0,393
0+220	-2,985	624,405	-8,978	627,390	-4,500	-3,000	627,433	-3,000	627,074	627,520	-0,446	2,90	3,000	627,607	4,500	627,650	5,713	627,074	627,520	-0,446	2,90	3,000	627,607	4,500	627,650	5,713	626,841	-0,809
0+227,937	-2,134	625,313	-7,701	627,447	-4,500	-3,000	627,485	-3,000	627,094	627,560	-0,466	2,50	3,000	627,635	4,500	627,672	5,432	627,094	627,560	-0,466	2,50	3,000	627,635	4,500	627,672	5,432	627,051	-0,621
0+240	-0,486	627,022	-5,229	627,508	-4,500	-3,000	627,545	-3,000	627,055	627,620	-0,565	2,50	3,000	627,695	4,500	627,733	4,850	627,055	627,620	-0,565	2,50	3,000	627,695	4,500	627,733	4,850	627,500	-0,233
0+260	-0,767	626,841	-5,650	627,608	-4,500	-3,000	627,645	-3,000	626,804	627,720	-0,916	2,50	3,000	627,795	4,500	627,833	4,986	626,804	627,720	-0,916	2,50	3,000	627,795	4,500	627,833	4,986	628,319	0,486
0+280	-1,119	626,589	-6,178	627,708	-4,500	-3,000	627,745	-3,000	626,380	627,820	-1,440	2,50	3,000	627,895	4,500	627,933	5,620	626,380	627,820	-1,440	2,50	3,000	627,895	4,500	627,933	5,620	627,186	-0,747
0+300	-0,949	626,859	-5,924	627,808	-4,500	-3,000	627,845	-3,000	626,684	627,920	-1,236	2,50	3,000	627,995	4,500	628,033	6,235	626,684	627,920	-1,236	2,50	3,000	627,995	4,500	628,033	6,235	626,876	-1,157
0+320	0,304	628,212	-4,804	627,908	-4,500	-3,000	627,945	-3,000	627,363	628,020	-0,657	2,50	3,000	628,095	4,500	628,133	5,749	627,363	628,020	-0,657	2,50	3,000	628,095	4,500	628,133	5,749	627,300	-0,833
0+340	0,279	628,287	-4,779	628,008	-4,500	-3,000	628,045	-3,000	628,044	628,120	-0,076	2,50	3,000	628,195	4,500	628,233	4,504	628,044	628,120	-0,076	2,50	3,000	628,195	4,500	628,233	4,504	628,230	-0,003
0+344,821	0,311	628,343	-4,811	628,032	-4,500	-3,000	628,069	-3,000	628,195	628,144	0,051	2,50	3,000	628,219	4,500	628,257	4,575	628,195	628,144	0,051	2,50	3,000	628,219	4,500	628,257	4,575	628,332	0,075
0+350	0,327	628,373	-4,827	628,046	-4,500	-3,000	628,087	-3,000	628,322	628,170	0,152	2,76	3,000	628,253	4,500	628,294	4,589	628,322	628,170	0,152	2,76	3,000	628,253	4,500	628,294	4,589	628,383	0,089
0+360	0,124	628,197	-4,624	628,073	-4,500	-3,000	628,122	-3,000	628,319	628,220	0,099	3,26	3,000	628,318	4,500	628,367	4,604	628,319	628,220	0,099	3,26	3,000	628,318	4,500	628,367	4,604	628,298	-0,069
0+370	-0,166	627,935	-4,748	628,101	-4,500	-3,000	628,157	-3,000	628,197	628,270	-0,073	3,76	3,000	628,383	4,500	628,439	4,870	628,197	628,270	-0,073	3,76	3,000	628,383	4,500	628,439	4,870	628,193	-0,246
0+374,821	-0,155	627,959	-4,733	628,114	-4,500	-3,000	628,174	-3,000	628,123	628,294	-0,171	4,00	3,000	628,414	4,500	628,474	5,018	628,123	628,294	-0,171	4,00	3,000	628,414	4,500	628,474	5,018	628,129	-0,345
0+380	-0,202	627,938	-4,803	628,140	-4,500	-3,000	628,200	-3,000	628,055	628,320	-0,265	4,00	3,000	628,440	4,500	628,500	5,173	628,055	628,320	-0,265	4,00	3,000	628,440	4,500	628,500	5,173	628,051	-0,449
0+389,732	-0,296	627,893	-4,944	628,189	-4,500	-3,000	628,249	-3,000	628,005	628,369	-0,364	4,00	3,000	628,489	4,500	628,549	5,297	628,005	628,369	-0,364	4,00	3,000	628,489	4,500	628,549	5,297	628,017	-0,532
0+390	-0,301	627,890	-4,952	628,191	-4,500	-3,000	628,250	-3,000	628,004	628,370	-0,366	3,99	3,000	628,489	4,500	628,549	5,299	628,004	628,370	-0,366	3,99	3,000	628,489	4,500	628,549	5,299	628,016	-0,533
0+400	-0,526	627,737	-5,289	628,263	-4,500	-3,000	628,315	-3,000	628,003	628,420	-0,417	3,49	3,000	628,525	4,500	628,577	5,393	628,003	628,420	-0,417	3,49	3,000	628,525	4,500	628,577	5,393	627,981	-0,596
0+410	-1,063	627,273	-6,094	628,336	-4,500	-3,000	628,380	-3,000	628,118	628,470	-0,352	2,99	3,000	628,560	4,500	628,604	5,348	628,118	628,470	-0,352	2,99	3,000	628,560	4,500	628,604	5,348	628,039	-0,565
0+419,732	-0,631	627,775	-5,447	628,406	-4,500	-3,000	628,444	-3,000	628,224	628,519	-0,295	2,50	3,000	628,594	4,500	628,631	5,172	628,224	628,519	-0,295	2,50	3,000	628,594	4,500	628,631	5,172	628,183	-0,448
0+420	-0,630	627,780	-5,445	628,410	-4,500	-3,000	628,446	-3,000	628,227	628,520	-0,293	2,46	3,000	628,594	4,500	628,630	5,167	628,227	628,520	-0,293	2,46	3,000	628,594	4,500	628,630	5,167	628,185	-0,445

Estaca	Lado Esquerdo						Eixo						Lado Direito													
	Offset			Lateral			Bordo			Cota			Cota Vermelha			Bordo			Lateral			Offset				
	Altura	Cota	Distância	Cota	Distância	%	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância	%	
0+440	-0,617	628,043	-5,426	628,660	-4,500	0,88	628,412	-3,000	0,88	628,412	628,620	-0,208	0,88	628,594	4,500	0,88	628,594	4,500	628,594	4,500	0,88	628,594	4,500	0,88	628,432	-0,148
0+460	-0,375	628,458	-5,063	628,833	-4,500	2,50	628,671	-3,000	2,50	628,671	628,720	-0,049	2,50	628,645	4,500	2,50	628,645	4,500	628,645	4,500	2,50	628,645	4,500	2,50	628,906	0,298
0+480	-0,148	628,851	-4,723	628,999	-4,500	2,50	629,032	-3,000	2,50	629,032	628,887	0,145	2,50	628,812	4,500	2,50	628,812	4,500	628,774	4,500	2,50	628,774	4,500	2,50	629,009	0,235
0+500	-0,055	629,244	-4,582	629,299	-4,500	2,50	629,383	-3,000	2,50	629,383	629,187	0,196	2,50	629,112	4,500	2,50	629,112	4,500	629,074	4,500	2,50	629,074	4,500	2,50	629,749	0,675
0+520	0,309	630,042	-4,809	629,733	-4,500	2,50	630,002	-3,000	2,50	630,002	629,620	0,382	2,50	629,545	4,500	2,50	629,545	4,500	629,508	4,500	2,50	629,508	4,500	2,50	631,349	1,841
0+540	0,112	630,411	-4,612	630,299	-4,500	2,50	630,629	-3,000	2,50	630,629	630,187	0,442	2,50	630,112	4,500	2,50	630,112	4,500	630,074	4,500	2,50	630,074	4,500	2,50	630,310	0,236
0+560	-0,580	630,419	-5,370	630,999	-4,500	2,50	631,170	-3,000	2,50	631,170	630,887	0,283	2,50	630,812	4,500	2,50	630,812	4,500	630,774	4,500	2,50	630,774	4,500	2,50	631,129	0,355
0+563,885	-0,715	630,436	-5,572	631,151	-4,500	2,50	631,277	-3,000	2,50	631,277	631,038	0,239	2,50	630,963	4,500	2,50	630,963	4,500	630,926	4,500	2,50	630,926	4,500	2,50	631,261	0,335
0+570	-0,837	630,576	-5,756	631,413	-4,500	2,81	631,456	-3,000	2,81	631,456	631,287	0,169	2,81	631,202	4,500	2,81	631,202	4,500	631,160	4,500	2,81	631,160	4,500	2,81	631,445	0,285
0+580	-1,045	630,824	-6,068	631,869	-4,500	3,31	631,753	-3,000	3,31	631,753	631,720	0,033	3,31	631,621	4,500	3,31	631,621	4,500	631,571	4,500	3,31	631,571	4,500	3,31	631,746	0,175
0+590	-0,820	631,521	-5,730	632,341	-4,500	3,81	632,133	-3,000	3,81	632,133	632,170	-0,037	3,81	632,056	4,500	3,81	632,056	4,500	631,999	4,500	3,81	631,999	4,500	3,81	632,041	0,042
0+593,885	-0,690	631,835	-5,535	632,525	-4,500	4,00	632,290	-3,000	4,00	632,290	632,345	-0,055	4,00	632,225	4,500	4,00	632,225	4,500	632,165	4,500	4,00	632,165	4,500	4,00	632,147	-0,018
0+600	-0,503	632,297	-5,254	632,800	-4,500	4,00	632,586	-3,000	4,00	632,586	632,620	-0,034	4,00	632,500	4,500	4,00	632,500	4,500	632,440	4,500	4,00	632,440	4,500	4,00	632,273	-0,167
0+610	-0,167	633,083	-4,750	633,250	-4,500	4,00	633,112	-3,000	4,00	633,112	633,070	0,042	4,00	632,950	4,500	4,00	632,950	4,500	632,890	4,500	4,00	632,890	4,500	4,00	632,767	-0,123
0+620	-0,021	633,679	-4,532	633,700	-4,500	4,00	633,665	-3,000	4,00	633,665	633,520	0,145	4,00	633,400	4,500	4,00	633,400	4,500	633,340	4,500	4,00	633,340	4,500	4,00	634,164	0,824
0+620,117	-0,021	633,684	-4,531	633,705	-4,500	4,00	633,671	-3,000	4,00	633,671	633,525	0,146	4,00	633,405	4,500	4,00	633,405	4,500	633,345	4,500	4,00	633,345	4,500	4,00	634,183	0,838
0+630	0,062	634,137	-4,562	634,075	-4,500	3,05	634,167	-3,000	3,05	634,167	633,938	0,229	3,05	633,846	4,500	3,05	633,846	4,500	633,800	4,500	3,05	633,800	4,500	3,05	634,304	0,504
0+640	0,482	634,867	-4,982	634,385	-4,500	2,09	634,599	-3,000	2,09	634,599	634,290	0,309	2,09	634,228	4,500	2,09	634,228	4,500	634,196	4,500	2,09	634,196	4,500	2,09	634,390	0,194
0+650	0,493	635,122	-4,994	634,629	-4,500	1,13	635,034	-3,000	1,13	635,034	634,578	0,456	1,13	634,544	4,500	1,13	634,544	4,500	634,527	4,500	1,13	634,527	4,500	1,13	635,029	0,502
0+650,117	0,493	635,125	-4,994	634,632	-4,500	1,12	635,039	-3,000	1,12	635,039	634,581	0,458	1,12	634,548	4,500	1,12	634,548	4,500	634,531	4,500	1,12	634,531	4,500	1,12	635,043	0,512
0+660	0,512	635,321	-5,012	634,809	-4,500	0,18	635,469	-3,000	0,18	635,469	634,801	0,668	0,18	634,796	4,500	0,18	634,796	4,500	634,793	4,500	0,18	634,793	4,500	0,18	635,572	0,779
0+670	0,464	635,395	-4,964	634,931	-4,500	-0,63	635,860	-3,000	-0,63	635,860	634,960	0,900	0,63	634,979	4,500	0,63	634,979	4,500	634,988	4,500	0,63	634,988	4,500	0,63	636,245	1,257
0+673,545	0,384	635,343	-4,884	634,959	-4,500	-0,91	635,921	-3,000	-0,91	635,921	635,000	0,921	0,91	635,027	4,500	0,91	635,027	4,500	635,041	4,500	0,91	635,041	4,500	0,91	636,384	1,343
0+680	0,352	635,342	-4,852	634,990	-4,500	-1,41	635,940	-3,000	-1,41	635,940	635,053	0,887	1,41	635,095	4,500	1,41	635,095	4,500	635,116	4,500	1,41	635,116	4,500	1,41	636,239	1,123
0+690	0,393	635,377	-4,893	634,984	-4,500	-2,18	635,966	-3,000	-2,18	635,966	635,082	0,884	2,18	635,147	4,500	2,18	635,147	4,500	635,180	4,500	2,18	635,180	4,500	2,18	635,891	0,711
0+700	0,567	635,480	-5,067	634,913	-4,500	-2,95	635,948	-3,000	-2,95	635,948	635,046	0,902	2,95	635,134	4,500	2,95	635,134	4,500	635,178	4,500	2,95	635,178	4,500	2,95	635,724	0,546
0+710	0,674	635,451	-5,174	634,777	-4,500	-3,73	635,820	-3,000	-3,73	635,820	634,944	0,876	3,73	635,056	4,500	3,73	635,056	4,500	635,112	4,500	3,73	635,112	4,500	3,73	635,562	0,450
0+713,545	0,690	635,403	-5,191	634,713	-4,500	-4,00	635,761	-3,000	-4,00	635,761	634,893	0,868	4,00	635,013	4,500	4,00	635,013	4,500	635,073	4,500	4,00	635,073	4,500	4,00	635,497	0,424

Estaca	Lado Esquerdo						Eixo						Lado Direito													
	Offset			Lateral			Bordo			Cota			Vermelha			Bordo			Lateral			Offset				
	Altura	Cota	Distância	Cota	Distância	%	Cota	Terreno	Projeto	Cota	%	Distância	Cota	Distância	%	Distância	Cota	Distância	Cota	Distância	%	Distância	Cota	Distância	Cota	Distância
0+720	0,721	635,320	-5,221	634,599	-4,500	-3,000	-4,00	635,615	634,779	0,836	4,00	3,000	634,899	4,500	634,959	5,002	635,461	0,502								
0+730	0,684	635,052	-5,184	634,368	-4,500	-3,000	-4,00	635,176	634,548	0,628	4,00	3,000	634,668	4,500	634,728	5,512	635,740	1,012								
0+740	0,359	634,371	-6,359	634,012	-6,000	-4,500	-4,00	634,635	634,252	0,383	4,00	4,500	634,432	6,000	634,492	7,100	635,592	1,100								
0+750	-0,224	633,430	-7,837	633,654	-7,500	-6,000	-4,00	633,892	633,954	-0,062	4,00	6,000	634,194	7,500	634,254	8,916	635,670	1,416								
0+760	-0,500	632,916	-8,251	633,416	-7,500	-6,000	-4,00	633,224	633,716	-0,492	4,00	6,000	633,956	7,500	634,016	8,795	635,311	1,295								
0+770	-0,744	632,494	-8,615	633,238	-7,500	-6,000	-4,00	632,690	633,538	-0,848	4,00	6,000	633,778	7,500	633,838	8,306	634,644	0,806								
0+780	-0,845	632,335	-7,268	633,180	-6,000	-4,500	-4,00	632,515	633,420	-0,905	4,00	4,500	633,600	6,000	633,660	6,274	633,934	0,274								
0+790	-0,848	632,333	-5,772	633,181	-4,500	-3,000	-4,00	632,433	633,361	-0,928	4,00	3,000	633,481	4,500	633,541	5,724	632,725	-0,816								
0+800	-0,704	632,478	-5,556	633,182	-4,500	-3,000	-4,00	632,463	633,362	-0,899	4,00	3,000	633,482	4,500	633,542	7,343	631,647	-1,895								
0+809,723	-0,725	632,516	-5,587	633,241	-4,500	-3,000	-4,00	632,512	633,421	-0,909	4,00	3,000	633,541	4,500	633,601	6,577	632,217	-1,384								
0+810	-0,718	632,526	-5,577	633,244	-4,500	-3,000	-3,99	632,513	633,424	-0,911	3,99	3,000	633,543	4,500	633,603	6,576	632,219	-1,384								
0+820	-0,664	632,718	-5,496	633,382	-4,500	-3,000	-3,61	632,564	633,545	-0,981	3,61	3,000	633,653	4,500	633,707	6,245	632,544	-1,163								
0+830	-0,970	632,610	-5,954	633,580	-4,500	-3,000	-3,24	632,677	633,726	-1,049	3,24	3,000	633,823	4,500	633,872	6,370	632,625	-1,247								
0+840	-0,783	633,055	-5,675	633,838	-4,500	-3,000	-2,86	632,897	633,967	-1,070	2,86	3,000	634,053	4,500	634,095	6,470	632,782	-1,313								
0+849,723	-1,015	633,131	-6,023	634,146	-4,500	-3,000	-2,50	633,156	634,258	-1,102	2,50	3,000	634,333	4,500	634,371	6,363	633,129	-1,242								
0+860	-1,400	633,192	-6,600	634,592	-4,500	-3,000	-0,79	633,398	634,628	-1,230	0,79	3,000	634,651	4,500	634,663	6,121	633,582	-1,081								
0+880	-1,002	634,639	-6,003	635,641	-4,500	-3,000	2,50	634,362	635,529	-1,167	-2,50	3,000	635,454	4,500	635,416	5,381	634,829	-0,587								
0+900	0,420	637,201	-4,920	636,781	-4,500	-3,000	2,50	636,482	636,669	-0,187	-2,50	3,000	636,594	4,500	636,556	4,927	636,271	-0,285								
0+920	0,933	638,974	-5,433	638,041	-4,500	-3,000	2,50	638,973	637,929	1,044	-2,50	3,000	637,854	4,500	637,816	7,637	640,952	3,136								
0+929,214	1,111	639,733	-5,611	638,622	-4,500	-3,000	2,50	639,902	638,509	1,393	-2,50	3,000	638,434	4,500	638,397	7,155	641,052	2,655								
0+930	1,053	639,726	-5,553	638,673	-4,500	-3,000	2,53	639,949	638,559	1,390	-2,53	3,000	638,483	4,500	638,445	7,120	641,065	2,620								
0+940	0,815	640,134	-5,315	639,319	-4,500	-3,000	2,90	640,554	639,189	1,365	-2,90	3,000	639,102	4,500	639,058	8,352	642,910	3,852								
0+950	0,920	640,796	-5,320	639,966	-4,500	-3,000	3,28	641,202	639,819	1,383	-3,28	3,000	639,720	4,500	639,671	8,610	643,781	4,110								
0+960	0,547	641,160	-5,047	640,613	-4,500	-3,000	3,65	641,821	640,449	1,372	-3,65	3,000	640,339	4,500	640,284	7,478	643,262	2,978								
0+969,214	0,284	641,493	-4,784	641,209	-4,500	-3,000	4,00	642,344	641,029	1,315	-4,00	3,000	640,909	4,500	640,849	6,009	642,358	1,509								
0+970	0,286	641,545	-4,786	641,259	-4,500	-3,000	4,00	642,385	641,079	1,306	-4,00	3,000	640,959	4,500	640,899	5,985	642,384	1,485								
0+980	0,455	642,344	-4,955	641,889	-4,500	-3,000	4,00	642,899	641,709	1,190	-4,00	3,000	641,589	4,500	641,529	5,766	642,795	1,266								
0+990	0,685	643,204	-5,185	642,519	-4,500	-3,000	4,00	643,394	642,339	1,055	-4,00	3,000	642,219	4,500	642,159	5,768	643,427	1,268								

Estaca	Lado Esquerdo						Eixo						Lado Direito											
	Offset			Lateral			Bordo			Cota			Cota Vermelha			Bordo			Lateral			Offset		
	Altura	Cota	Distância	Distância	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância	Distância	Cota	Distância	Distância	Cota	Distância	Distância	Cota	Distância	Cota
1	0,678	643,826	-5,178	-4,500	643,088	-3,000	4,00	643,871	642,968	0,903	-4,00	3,000	642,848	4,500	642,788	6,122	644,410	1,622						
1+10	0,237	643,990	-4,737	-4,500	643,701	-3,000	3,42	644,343	643,598	0,745	-3,42	3,000	643,496	4,500	643,444	6,352	645,296	1,852						
1+20	0,487	644,808	-4,987	-4,500	644,290	-3,000	2,06	644,866	644,228	0,638	-2,06	3,000	644,167	4,500	644,136	5,786	645,422	1,286						
1+30	0,550	645,465	-5,050	-4,500	644,905	-3,000	0,69	645,428	644,884	0,544	-0,69	3,000	644,864	4,500	644,853	5,158	645,511	0,658						
1+35,038	0,499	645,734	-4,999	-4,500	645,235	-3,000	0,00	645,733	645,235	0,498	0,00	3,000	645,235	4,500	645,235	4,928	645,663	0,428						
1+40	0,437	646,000	-4,937	-4,500	645,573	-3,000	-0,66	646,032	645,592	0,440	0,66	3,000	645,612	4,500	645,622	4,705	645,827	0,205						
1+50	-1,589	644,674	-6,884	-4,500	646,293	-3,000	-1,98	646,638	646,352	0,286	1,98	3,000	646,412	4,500	646,441	4,557	646,498	0,057						
1+60	-0,692	646,324	-5,537	-4,500	647,065	-3,000	-3,30	647,158	647,164	-0,006	3,30	3,000	647,263	4,500	647,313	4,766	647,135	-0,178						
1+70	-2,790	645,058	-8,685	-4,500	647,908	-3,000	-4,00	647,635	648,028	-0,393	4,00	3,000	648,148	4,500	648,208	5,006	647,871	-0,337						
1+80	-4,759	644,005	-11,639	-4,500	648,824	-3,000	-4,00	648,190	648,944	-0,754	4,00	3,000	649,064	4,500	649,124	5,449	648,492	-0,632						
1+81,326	-4,911	643,979	-11,866	-4,500	648,950	-3,000	-4,00	648,323	649,070	-0,747	4,00	3,000	649,190	4,500	649,250	5,467	648,605	-0,645						
1+90	-5,979	643,789	-13,468	-4,500	649,816	-3,000	-3,20	649,188	649,912	-0,724	3,20	3,000	650,008	4,500	650,056	5,702	649,255	-0,801						
1+100	-4,293	646,537	-10,940	-4,500	650,864	-3,000	-2,28	650,445	650,932	-0,487	2,28	3,000	651,001	4,500	651,035	5,609	650,296	-0,739						
1+110	-0,132	651,811	-4,698	-4,500	651,964	-3,000	-1,35	652,034	652,004	0,030	1,35	3,000	652,045	4,500	652,065	5,016	651,721	-0,344						
1+120	0,015	653,124	-4,515	-4,500	653,115	-3,000	-0,43	653,419	653,128	0,291	0,43	3,000	653,141	4,500	653,148	4,742	653,390	0,242						
1+121,326	0,041	653,308	-4,541	-4,500	653,272	-3,000	-0,31	653,584	653,281	0,303	0,31	3,000	653,290	4,500	653,295	4,806	653,601	0,306						
1+128,034	0,166	654,236	-4,666	-4,500	654,064	-3,000	0,40	654,416	654,052	0,364	-0,40	3,000	654,040	4,500	654,034	5,319	654,853	0,819						
1+130	0,201	654,508	-4,701	-4,500	654,297	-3,000	0,64	654,660	654,278	0,382	-0,64	3,000	654,259	4,500	654,250	5,469	655,219	0,969						
1+140	0,122	655,633	-4,622	-4,500	655,483	-3,000	1,84	655,756	655,428	0,328	1,84	3,000	655,373	4,500	655,346	5,633	656,479	1,133						
1+150	-0,170	656,545	-4,755	-4,500	656,669	-3,000	3,04	656,701	656,578	0,123	-3,04	3,000	656,487	4,500	656,442	5,408	657,350	0,908						
1+158,034	-0,312	657,370	-4,968	-4,500	657,622	-3,000	4,00	657,602	657,502	0,100	4,00	3,000	657,382	4,500	657,322	5,617	658,439	1,117						
1+160	-0,305	657,603	-4,958	-4,500	657,848	-3,000	4,00	657,842	657,728	0,114	4,00	3,000	657,608	4,500	657,548	5,641	658,689	1,141						
1+170	-0,126	658,932	-4,690	-4,500	658,998	-3,000	4,00	659,057	658,878	0,179	4,00	3,000	658,758	4,500	658,698	5,928	660,126	1,428						
1+180	-0,279	659,929	-4,919	-4,500	660,148	-3,000	4,00	660,073	660,028	0,045	4,00	3,000	659,908	4,500	659,848	5,631	660,979	1,131						
1+190	-0,405	660,953	-5,108	-4,500	661,358	-3,000	4,00	661,060	661,178	-0,118	4,00	3,000	661,058	4,500	660,998	5,427	661,925	0,927						
1+200	-0,494	662,014	-5,240	-4,500	662,448	-3,000	4,00	662,065	662,328	-0,263	4,00	3,000	662,208	4,500	662,148	5,399	663,047	0,899						
1+210	-0,531	663,127	-5,296	-4,500	663,598	-3,000	4,00	662,947	663,478	-0,531	4,00	3,000	663,358	4,500	663,298	5,541	664,339	1,041						
1+220	-0,563	664,245	-5,345	-4,500	664,748	-3,000	4,00	664,264	664,628	-0,364	4,00	3,000	664,508	4,500	664,448	6,538	666,486	2,038						

Estaca	Lado Esquerdo						Eixo						Lado Direito									
	Offset			Lateral			Bordo	Cota	Terreno	Cota	Projeto	Cota	Vermelha	Bordo			Lateral			Offset		
	Altura	Cota	Distância	Cota	Distância	%								Distância	Cota	Distância	%	Distância	Cota	Distância	Cota	Distância
1+230	-0,520	665,438	-5,280	665,958	-4,500	665,898	-3,000	4,00	665,974	665,778	0,196	0,196	-4,00	3,000	665,658	4,500	665,598	7,157	668,255	2,657		
1+240	-0,173	666,935	-4,759	667,108	-4,500	667,048	-3,000	4,00	667,718	666,928	0,790	0,790	-4,00	3,000	666,808	4,500	666,748	6,786	669,034	2,286		
1+250	0,034	668,292	-4,534	668,258	-4,500	668,198	-3,000	4,00	668,164	668,078	0,086	0,086	-4,00	3,000	667,958	4,500	667,898	5,877	669,275	1,377		
1+260	-0,038	669,370	-4,566	669,408	-4,500	669,348	-3,000	4,00	669,591	669,228	0,363	0,363	-4,00	3,000	669,108	4,500	669,048	5,244	669,792	0,744		
1+263,463	-0,264	669,543	-4,896	669,807	-4,500	669,747	-3,000	4,00	669,860	669,627	0,253	0,253	-4,00	3,000	669,507	4,500	669,447	5,033	669,980	0,533		
1+270	-0,453	670,091	-5,179	670,544	-4,500	670,488	-3,000	3,67	670,423	670,378	0,045	0,045	-3,67	3,000	670,268	4,500	670,213	4,621	670,334	0,121		
1+280	-1,159	670,512	-6,238	671,671	-4,500	671,623	-3,000	3,17	671,128	671,528	-0,400	-0,400	-3,17	3,000	671,433	4,500	671,386	4,855	671,150	-0,236		
1+290	-1,300	671,499	-6,449	672,799	-4,500	672,758	-3,000	2,67	672,211	672,678	-0,467	-0,467	-2,67	3,000	672,598	4,500	672,558	5,289	672,032	-0,526		
1+293,463	-1,347	671,842	-6,521	673,189	-4,500	673,152	-3,000	2,50	672,569	673,077	-0,488	-0,488	-2,50	3,000	673,002	4,500	672,964	5,292	672,436	-0,528		
1+300	-1,484	672,457	-6,726	673,941	-4,500	673,903	-3,000	2,50	673,362	673,828	-0,466	-0,466	-2,50	3,000	673,753	4,500	673,716	5,136	673,292	-0,424		
1+315,924	-0,594	675,178	-5,391	675,772	-4,500	675,735	-3,000	2,50	675,499	675,660	-0,161	-0,161	-2,50	3,000	675,585	4,500	675,547	5,951	676,998	1,451		
1+320	-0,406	675,844	-5,109	676,250	-4,500	676,209	-3,000	2,70	676,096	676,128	-0,032	-0,032	-2,70	3,000	676,047	4,500	676,007	6,229	677,735	1,728		
1+325	-0,118	676,718	-4,677	676,836	-4,500	676,792	-3,000	2,95	676,895	676,703	0,192	0,192	-2,95	3,000	676,615	4,500	676,570	6,344	678,414	1,844		
1+330	0,099	677,521	-4,599	677,422	-4,500	677,374	-3,000	3,20	677,707	677,278	0,429	0,429	-3,20	3,000	677,182	4,500	677,134	6,499	679,133	1,999		
1+335	0,298	678,307	-4,798	678,009	-4,500	677,957	-3,000	3,45	678,502	677,853	0,649	0,649	-3,45	3,000	677,750	4,500	677,698	6,614	679,811	2,113		
1+340	0,285	678,890	-4,785	678,595	-4,500	678,539	-3,000	3,70	679,180	678,428	0,752	0,752	-3,70	3,000	678,317	4,500	678,262	6,491	680,253	1,991		
1+345	0,367	679,540	-4,867	679,173	-4,500	679,113	-3,000	3,95	679,869	678,995	0,874	0,874	-3,95	3,000	678,876	4,500	678,817	6,416	680,733	1,916		
1+345,924	0,403	679,680	-4,903	679,277	-4,500	679,217	-3,000	4,00	679,997	679,097	0,900	0,900	-4,00	3,000	678,977	4,500	678,917	6,410	680,827	1,910		
1+350	0,422	680,146	-4,922	679,724	-4,500	679,664	-3,000	4,00	680,569	679,544	1,025	1,025	-4,00	3,000	679,424	4,500	679,364	6,413	681,277	1,913		
1+355	0,322	680,578	-4,822	680,256	-4,500	680,196	-3,000	4,00	681,005	680,076	0,929	0,929	-4,00	3,000	679,956	4,500	679,896	6,028	681,424	1,528		
1+360	0,362	681,132	-4,862	680,770	-4,500	680,710	-3,000	4,00	681,424	680,590	0,834	0,834	-4,00	3,000	680,470	4,500	680,410	5,746	681,656	1,246		
1+365	0,340	681,608	-4,840	681,268	-4,500	681,208	-3,000	4,00	681,849	681,088	0,761	0,761	-4,00	3,000	680,968	4,500	680,908	5,646	682,054	1,146		
1+370	0,199	681,947	-4,699	681,748	-4,500	681,688	-3,000	4,00	682,280	681,568	0,712	0,712	-4,00	3,000	681,448	4,500	681,388	5,349	682,237	0,849		
1+375	-0,179	682,032	-4,768	682,211	-4,500	682,151	-3,000	4,00	682,572	682,031	0,541	0,541	-4,00	3,000	681,911	4,500	681,851	4,879	682,230	0,379		
1+380	-0,723	681,934	-5,585	682,657	-4,500	682,597	-3,000	4,00	682,828	682,477	0,351	0,351	-4,00	3,000	682,357	4,500	682,297	4,692	682,489	0,192		
1+385	-1,048	682,037	-6,072	683,085	-4,500	683,025	-3,000	4,00	683,099	682,905	0,194	0,194	-4,00	3,000	682,785	4,500	682,725	4,638	682,863	0,138		
1+390	-1,254	682,242	-6,381	683,496	-4,500	683,436	-3,000	4,00	683,388	683,316	0,072	0,072	-4,00	3,000	683,196	4,500	683,136	4,685	683,320	0,184		
1+395	-1,520	682,370	-6,780	683,890	-4,500	683,830	-3,000	4,00	683,712	683,710	0,002	0,002	-4,00	3,000	683,590	4,500	683,530	4,565	683,487	-0,043		



Estaca	Lado Esquerdo						Eixo						Lado Direito											
	Offset			Lateral			Bordo			Cota			Cota Vermelha			Bordo			Lateral			Offset		
	Altura	Cota	Distância	Cota	Distância	%	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância
1+400	-1,575	682,692	-6,863	684,267	-4,500	684,207	-3,000	4,00	684,041	684,087	-0,046	-4,00	3,000	683,967	4,500	683,907	4,664	683,798	-0,109					
1+403,472	-1,509	683,013	-6,764	684,522	-4,500	684,462	-3,000	4,00	684,274	684,342	-0,068	-4,00	3,000	684,222	4,500	684,162	4,742	684,001	-0,161					
1+405	-1,468	683,164	-6,702	684,632	-4,500	684,573	-3,000	3,92	684,378	684,455	-0,077	-3,92	3,000	684,337	4,500	684,278	4,789	684,086	-0,192					
1+410	-1,380	683,608	-6,570	684,988	-4,500	684,933	-3,000	3,67	684,722	684,823	-0,101	-3,67	3,000	684,713	4,500	684,658	4,961	684,351	-0,307					
1+415	-0,931	684,414	-5,896	685,345	-4,500	685,294	-3,000	3,42	685,239	685,191	0,048	-3,42	3,000	685,088	4,500	685,037	4,772	684,856	-0,181					
1+420	-0,426	685,276	-5,140	685,702	-4,500	685,654	-3,000	3,17	685,779	685,559	0,220	-3,17	3,000	685,464	4,500	685,416	4,576	685,492	0,076					
1+425	0,014	686,073	-4,514	686,059	-4,500	686,015	-3,000	2,92	686,322	685,927	0,395	-2,92	3,000	685,840	4,500	685,796	5,149	686,445	0,649					
1+430	0,371	686,787	-4,871	686,416	-4,500	686,376	-3,000	2,67	686,860	686,295	0,565	-2,67	3,000	686,215	4,500	686,175	5,314	686,989	0,814					
1+433,472	0,333	686,997	-4,833	686,664	-4,500	686,626	-3,000	2,50	687,066	686,551	0,515	-2,50	3,000	686,476	4,500	686,439	5,226	687,165	0,726					
1+440	0,286	687,382	-4,786	687,096	-4,500	687,075	-3,000	1,44	687,452	687,032	0,420	-1,44	3,000	686,989	4,500	686,967	4,976	687,443	0,476					
1+460	0,338	688,760	-4,838	688,422	-4,500	688,449	-3,000	-1,82	688,989	688,504	0,465	1,82	3,000	688,559	4,500	688,586	5,136	689,222	0,636					
1+464,147	0,398	689,095	-4,898	688,697	-4,500	688,734	-3,000	-2,50	689,352	688,809	0,543	2,50	3,000	688,884	4,500	688,922	5,162	689,584	0,662					
1+470	0,422	689,536	-4,922	689,114	-4,500	689,156	-3,000	-2,79	689,891	689,240	0,651	2,79	3,000	689,324	4,500	689,366	5,187	690,053	0,687					
1+480	0,793	690,621	-5,293	689,828	-4,500	689,878	-3,000	-3,29	690,826	689,976	0,850	3,29	3,000	690,075	4,500	690,125	5,715	691,340	1,215					
1+490	1,038	691,580	-5,538	690,542	-4,500	690,599	-3,000	-3,79	691,740	690,713	1,027	3,79	3,000	690,826	4,500	690,883	6,067	692,450	1,567					
1+494,147	0,965	691,803	-5,465	690,838	-4,500	690,898	-3,000	-4,00	691,902	691,018	0,884	4,00	3,000	691,138	4,500	691,198	5,888	692,586	1,388					
1+500	0,823	692,092	-5,323	691,269	-4,500	691,329	-3,000	-4,00	692,127	691,449	0,678	4,00	3,000	691,569	4,500	691,629	5,637	692,766	1,137					
1+510	0,424	692,429	-4,924	692,005	-4,500	692,065	-3,000	-4,00	692,492	692,185	0,307	4,00	3,000	692,305	4,500	692,365	5,170	693,035	0,670					
1+520	-0,004	692,737	-4,506	692,741	-4,500	692,801	-3,000	-4,00	692,980	692,921	0,059	4,00	3,000	693,041	4,500	693,101	4,622	693,223	0,122					
1+530	-0,210	693,267	-4,815	693,477	-4,500	693,537	-3,000	-4,00	693,515	693,657	-0,142	4,00	3,000	693,777	4,500	693,837	5,017	694,354	0,517					
1+540	-0,117	694,096	-4,676	694,213	-4,500	694,273	-3,000	-4,00	694,323	694,393	-0,070	4,00	3,000	694,513	4,500	694,573	5,130	695,203	0,630					
1+550	-0,042	694,946	-4,563	694,988	-4,500	695,048	-3,000	-4,00	695,161	695,168	-0,007	4,00	3,000	695,288	4,500	695,348	5,042	695,890	0,542					
1+552,570	-0,027	695,173	-4,540	695,200	-4,500	695,260	-3,000	-4,00	695,399	695,380	0,019	4,00	3,000	695,500	4,500	695,560	5,007	696,067	0,507					
1+560	-0,040	695,840	-4,561	695,880	-4,500	695,927	-3,000	-3,13	696,084	696,020	0,064	3,13	3,000	696,114	4,500	696,161	4,777	696,438	0,277					
1+570	-0,065	696,797	-4,598	696,862	-4,500	696,891	-3,000	-1,95	697,013	696,950	0,063	1,95	3,000	697,008	4,500	697,038	4,543	697,081	0,043					
1+580	-0,439	697,483	-5,159	697,922	-4,500	697,933	-3,000	-0,77	698,020	697,957	0,063	0,77	3,000	697,980	4,500	697,991	4,533	697,969	-0,022					
1+586,570	-0,547	698,113	-5,320	698,660	-4,500	698,660	-3,000	0,00	698,669	698,660	0,009	0,00	3,000	698,660	4,500	698,660	4,628	698,575	-0,085					
1+590	-0,359	698,700	-5,039	699,059	-4,500	699,053	-3,000	0,41	699,056	699,041	0,015	-0,41	3,000	699,028	4,500	699,022	4,686	698,898	-0,124					

Estaca	Lado Esquerdo						Eixo						Lado Direito											
	Offset			Lateral			Bordo			Cota			Cota Vermelha			Bordo			Lateral			Offset		
	Altura	Cota	Distância	Distância	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância	Cota	Distância	Distância	Cota	Distância	Cota	Distância	Cota	Distância	Cota
1+595	-0,098	699,559	-4,647	699,657	-4,500	699,642	-3,000	1,00	699,619	699,612	0,007	3,000	699,582	4,500	699,567	4,801	699,366	-0,201						
1+600	0,071	700,345	-4,571	700,274	-4,500	700,250	-3,000	1,60	700,177	700,202	-0,025	3,000	700,154	4,500	700,130	4,942	699,836	-0,294						
1+605	-0,024	700,877	-4,537	700,901	-4,500	700,868	-3,000	2,19	700,747	700,802	-0,055	3,000	700,736	4,500	700,704	4,876	700,453	-0,251						
1+610	-0,257	701,270	-4,885	701,527	-4,500	701,485	-3,000	2,78	701,334	701,402	-0,068	3,000	701,319	4,500	701,277	4,581	701,358	0,081						
1+615	-0,269	701,885	-4,904	702,154	-4,500	702,103	-3,000	3,38	701,894	702,002	-0,108	3,000	701,901	4,500	701,850	4,735	701,693	-0,157						
1+620	-0,322	702,459	-4,984	702,781	-4,500	702,721	-3,000	3,97	702,327	702,602	-0,275	3,000	702,483	4,500	702,423	5,055	702,053	-0,370						
1+620,250	-0,324	702,488	-4,986	702,812	-4,500	702,752	-3,000	4,00	702,346	702,632	-0,286	3,000	702,512	4,500	702,452	5,068	702,073	-0,379						
1+625	-0,056	703,291	-4,584	703,347	-4,500	703,287	-3,000	4,00	702,509	703,167	-0,658	3,000	703,047	4,500	702,987	5,081	702,600	-0,387						
1+630	0,729	704,569	-5,229	703,840	-4,500	703,780	-3,000	4,00	703,699	703,660	0,039	3,000	703,540	4,500	703,480	5,346	702,916	-0,564						
1+635	1,409	705,702	-6,659	704,293	-5,250	704,233	-3,750	4,00	705,045	704,083	0,962	3,750	703,933	5,250	703,873	5,632	703,618	-0,255						
1+636,610	1,655	706,079	-7,147	704,424	-5,492	704,364	-3,992	4,00	705,363	704,204	1,159	4,00	704,045	5,492	703,985	5,683	704,176	0,191						
1+640	2,351	706,999	-8,351	704,648	-6,000	704,595	-4,500	3,55	706,000	704,435	1,565	4,500	704,276	6,000	704,222	6,667	704,889	0,667						
1+645	3,245	708,156	-9,995	704,911	-6,750	704,868	-5,250	2,88	706,803	704,717	2,086	5,250	704,565	6,750	704,522	7,757	705,529	1,007						
1+650	3,569	708,662	-11,069	705,093	-7,500	705,060	-6,000	2,22	707,261	704,927	2,334	6,000	704,794	7,500	704,761	8,732	705,993	1,232						
1+655	3,131	708,314	-10,631	705,183	-7,500	705,160	-6,000	1,55	707,484	705,067	2,417	6,000	704,974	7,500	704,950	9,075	706,525	1,575						
1+660	2,791	707,993	-10,291	705,202	-7,500	705,188	-6,000	0,88	707,670	705,135	2,535	6,000	705,082	7,500	705,069	9,454	707,023	1,954						
1+665	2,541	707,690	-10,041	705,149	-7,500	705,146	-6,000	0,22	707,818	705,133	2,685	6,000	705,120	7,500	705,117	9,702	707,319	2,202						
1+666,620	2,379	707,496	-9,879	705,117	-7,500	705,117	-6,000	0,00	707,712	705,117	2,595	6,000	705,117	7,500	705,117	9,723	707,340	2,223						
1+670	2,083	707,110	-9,583	705,027	-7,500	705,033	-6,000	-0,45	707,183	705,060	2,123	6,000	705,087	7,500	705,094	9,772	707,366	2,272						
1+675	1,911	706,752	-8,661	704,841	-6,750	704,858	-5,250	-1,12	706,694	704,917	1,777	5,250	704,975	6,750	704,992	9,025	707,267	2,275						
1+680	1,639	706,234	-7,639	704,595	-6,000	704,622	-4,500	-1,78	706,554	704,702	1,852	4,500	704,782	6,000	704,809	8,235	707,044	2,235						
1+685	1,604	705,892	-6,854	704,288	-5,250	704,325	-3,750	-2,45	706,378	704,417	1,961	3,750	704,508	5,250	704,545	7,518	706,813	2,268						
1+690	1,821	705,741	-6,321	703,920	-4,500	703,967	-3,000	-3,12	706,188	704,060	2,128	3,000	704,154	4,500	704,201	7,082	706,783	2,582						
1+695	1,818	705,281	-6,318	703,463	-4,500	703,520	-3,000	-3,78	705,886	703,633	2,253	3,000	703,747	4,500	703,804	7,253	706,557	2,753						
1+696,620	1,815	705,115	-6,315	703,300	-4,500	703,360	-3,000	-4,00	705,703	703,480	2,223	3,000	703,600	4,500	703,660	7,126	706,286	2,626						
1+700	1,807	704,762	-6,307	702,955	-4,500	703,015	-3,000	-4,00	705,308	703,135	2,173	3,000	703,255	4,500	703,315	6,884	705,699	2,384						
1+705	1,842	704,229	-6,342	702,387	-4,500	702,447	-3,000	-4,00	704,660	702,567	2,093	3,000	702,687	4,500	702,747	6,078	704,325	1,578						
1+710	1,966	703,713	-6,467	701,747	-4,500	701,807	-3,000	-4,00	704,024	701,927	2,097	3,000	702,047	4,500	702,107	6,058	703,665	1,558						

Estaca	Lado Esquerdo						Eixo						Lado Direito												
	Offset			Lateral			Bordo			Cota			Vermelha			Bordo			Lateral			Offset			
	Altura	Cota	Distância	Cota	Distância	%	Cota	Terreno	Projeto	Cota	%	Distância	Cota	Distância	%	Distância	Cota	Distância	Cota	Distância	%	Distância	Cota	Distância	Cota
1+715	2,173	703,245	-6,673	701,072	-4,500	-3,000	-4,00	703,386	701,252	2,134	4,00	3,000	701,372	4,500	701,432	6,204	703,136	1,704							
1+720	2,138	702,535	-6,638	700,397	-4,500	-3,000	-4,00	702,684	700,577	2,107	4,00	3,000	700,697	4,500	700,757	6,131	702,388	1,631							
1+725	2,146	701,868	-6,646	699,722	-4,500	-3,000	-4,00	701,612	699,902	1,710	4,00	3,000	700,022	4,500	700,082	5,917	701,499	1,417							
1+730	2,184	701,231	-6,684	699,047	-4,500	-3,000	-4,00	700,766	699,227	1,539	4,00	3,000	699,347	4,500	699,407	6,232	701,139	1,732							
1+734,182	2,163	700,645	-6,663	698,482	-4,500	-3,000	-4,00	700,024	698,662	1,362	4,00	3,000	698,782	4,500	698,842	6,641	700,982	2,140							
1+735	2,168	700,542	-6,668	698,374	-4,500	-3,000	-3,96	699,919	698,552	1,367	3,96	3,000	698,671	4,500	698,730	6,667	700,897	2,167							
1+740	2,158	699,868	-6,658	697,710	-4,500	-3,000	-3,71	699,127	697,877	1,250	3,71	3,000	697,988	4,500	698,044	6,307	699,851	1,807							
1+745	2,087	699,133	-6,587	697,046	-4,500	-3,000	-3,46	698,331	697,202	1,129	3,46	3,000	697,306	4,500	697,358	5,619	698,477	1,119							
1+750	1,978	698,361	-6,478	696,383	-4,500	-3,000	-3,21	697,475	696,527	0,948	3,21	3,000	696,623	4,500	696,671	5,168	697,339	0,668							
1+755	1,857	697,576	-6,357	695,719	-4,500	-3,000	-2,96	696,578	695,852	0,726	2,96	3,000	695,941	4,500	695,985	5,189	696,674	0,689							
1+760	1,549	696,604	-6,049	695,055	-4,500	-3,000	-2,71	696,694	695,177	1,517	2,71	3,000	695,258	4,500	695,299	5,180	695,979	0,680							
1+764,182	1,251	695,751	-5,751	694,500	-4,500	-3,000	-2,50	695,943	694,612	1,331	2,50	3,000	694,687	4,500	694,725	5,155	695,380	0,655							
1+780	-0,140	692,343	-4,710	692,483	-4,500	-3,000	0,14	692,768	692,477	0,311	-0,14	3,000	692,473	4,500	692,471	4,919	692,890	0,419							
1+800	-2,139	687,751	-7,709	689,890	-4,500	-3,000	2,50	689,193	689,777	-0,584	-2,50	3,000	689,702	4,500	689,665	4,729	689,894	0,229							
1+820	-3,130	684,060	-9,196	687,190	-4,500	-3,000	2,50	685,894	687,077	-1,183	-2,50	3,000	687,002	4,500	686,965	4,780	686,778	-0,187							
1+840	-1,902	682,588	-7,352	684,490	-4,500	-3,000	2,50	684,142	684,377	-0,235	-2,50	3,000	684,302	4,500	684,265	4,911	684,676	0,411							
1+860	-0,653	681,137	-5,480	681,790	-4,500	-3,000	2,50	681,747	681,677	0,070	-2,50	3,000	681,602	4,500	681,565	5,594	682,659	1,094							
1+880	-0,812	678,603	-5,718	679,415	-4,500	-3,000	2,50	678,710	679,302	-0,592	-2,50	3,000	679,227	4,500	679,190	5,408	680,098	0,908							
1+900	-2,826	674,864	-8,739	677,690	-4,500	-3,000	2,50	676,333	677,577	-1,244	-2,50	3,000	677,502	4,500	677,465	5,354	678,319	0,854							
1+901,184	-3,029	674,579	-9,044	677,608	-4,500	-3,000	2,50	676,224	677,495	-1,271	-2,50	3,000	677,420	4,500	677,383	5,363	678,246	0,863							
1+910	-2,358	674,733	-8,038	677,091	-4,500	-3,000	2,94	676,140	676,958	-0,818	-2,94	3,000	676,870	4,500	676,826	5,237	677,563	0,737							
1+920	-1,484	675,173	-6,726	676,657	-4,500	-3,000	3,44	676,038	676,502	-0,464	-3,44	3,000	676,399	4,500	676,347	4,896	676,743	0,396							
1+930	-1,002	675,384	-6,002	676,386	-4,500	-3,000	3,94	676,011	676,208	-0,197	-3,94	3,000	676,090	4,500	676,031	5,190	676,721	0,690							
1+931,184	-0,965	675,399	-5,947	676,364	-4,500	-3,000	4,00	676,013	676,184	-0,171	-4,00	3,000	676,064	4,500	676,004	5,248	676,752	0,748							
1+940	-0,649	675,608	-5,473	676,257	-4,500	-3,000	4,00	675,994	676,077	-0,083	-4,00	3,000	675,957	4,500	675,897	5,614	677,011	1,114							
1+950	0,116	676,404	-4,616	676,288	-4,500	-3,000	4,00	676,307	676,108	0,199	-4,00	3,000	675,988	4,500	675,928	6,373	677,801	1,873							
1+960	0,040	676,522	-4,540	676,482	-4,500	-3,000	4,00	676,632	676,302	0,330	-4,00	3,000	676,182	4,500	676,122	7,045	678,667	2,545							
1+970	0,508	677,346	-5,008	676,838	-4,500	-3,000	4,00	677,354	676,658	0,696	-4,00	3,000	676,538	4,500	676,478	7,766	679,744	3,266							

Estaca	Lado Esquerdo						Eixo						Lado Direito												
	Offset			Lateral			Bordo			Cota			Cota Vermelha			Bordo			Lateral			Offset			
	Altura	Cota	Distância	Distância	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Vermelha	%	Distância	Cota	Distância	Distância	Cota	Distância	Cota	Distância	Distância	Cota
1+971,091	0,560	677,447	-5,060	676,887	-4,500	676,827	-3,000	4,00	677,442	676,707	0,735	-4,00	3,000	676,587	4,500	676,527	7,849	679,876	3,349						
1+980	0,630	677,967	-5,130	677,337	-4,500	677,284	-3,000	3,55	678,202	677,177	1,025	-3,55	3,000	677,070	4,500	677,017	8,262	680,779	3,762						
1+990	0,679	678,527	-5,179	677,848	-4,500	677,802	-3,000	3,05	678,795	677,710	1,085	-3,05	3,000	677,619	4,500	677,573	8,205	681,278	3,705						
2	0,991	679,216	-5,491	678,225	-4,500	678,187	-3,000	2,55	679,427	678,110	1,317	-2,55	3,000	678,034	4,500	677,995	8,057	681,552	3,557						
2+1,091	1,035	679,293	-5,535	678,258	-4,500	678,221	-3,000	2,50	679,493	678,146	1,347	-2,50	3,000	678,071	4,500	678,033	8,055	681,588	3,555						
2+20	0,639	679,262	-5,139	678,623	-4,500	678,585	-3,000	2,50	679,898	678,510	1,388	-2,50	3,000	678,435	4,500	678,398	7,561	681,459	3,061						
2+40	0,677	679,167	-5,178	678,490	-4,500	678,452	-3,000	2,50	679,828	678,377	1,451	-2,50	3,000	678,302	4,500	678,265	7,981	681,746	3,481						
2+60	0,944	678,767	-5,444	677,823	-4,500	677,785	-3,000	2,50	679,321	677,710	1,611	-2,50	3,000	677,635	4,500	677,598	8,397	681,494	3,896						
2+66,325	0,964	678,465	-5,464	677,501	-4,500	677,464	-3,000	2,50	679,006	677,389	1,617	-2,50	3,000	677,314	4,500	677,276	8,508	681,284	4,008						
2+70	0,989	678,287	-5,489	677,298	-4,500	677,258	-3,000	2,68	678,815	677,177	1,638	-2,68	3,000	677,097	4,500	677,056	8,564	681,119	4,063						
2+80	1,083	677,737	-5,583	676,654	-4,500	676,606	-3,000	3,18	678,265	676,510	1,755	-3,18	3,000	676,415	4,500	676,367	8,768	680,635	4,268						
2+90	1,095	676,971	-5,595	675,876	-4,500	675,821	-3,000	3,68	677,222	675,710	1,512	-3,68	3,000	675,600	4,500	675,545	8,421	679,466	3,921						
2+96,325	1,202	676,518	-5,702	675,316	-4,500	675,256	-3,000	4,00	676,571	675,136	1,435	-4,00	3,000	675,016	4,500	674,956	8,295	678,751	3,795						
2+100	0,783	675,740	-5,283	674,957	-4,500	674,897	-3,000	4,00	676,184	674,777	1,407	-4,00	3,000	674,657	4,500	674,597	8,288	678,385	3,788						
2+110	0,220	674,157	-4,720	673,937	-4,500	673,900	-3,000	2,49	674,560	673,825	0,735	-2,49	3,000	673,751	4,500	673,714	7,650	676,864	3,150						
2+120	-0,140	672,873	-4,710	673,013	-4,500	672,999	-3,000	0,95	673,000	672,971	0,029	-0,95	3,000	672,942	4,500	672,928	6,953	675,381	2,453						
2+126,168	-0,122	672,370	-4,683	672,492	-4,500	672,492	-3,000	0,00	672,314	672,492	-0,178	0,00	3,000	672,492	4,500	672,492	4,893	672,885	0,393						
2+130	-0,584	671,605	-5,376	672,189	-4,500	672,197	-3,000	-0,52	671,813	672,213	-0,400	0,52	3,000	672,229	4,500	672,237	4,732	672,083	-0,154						
2+140	-2,923	668,544	-8,885	671,467	-4,500	671,495	-3,000	-1,89	670,819	671,552	-0,733	1,89	3,000	671,609	4,500	671,637	5,500	670,970	-0,667						
2+150	-3,364	667,477	-9,546	670,841	-4,500	670,890	-3,000	-3,26	670,274	670,988	-0,714	3,26	3,000	671,086	4,500	671,135	5,412	670,527	-0,608						
2+160	-4,597	665,744	-11,395	670,341	-4,500	670,401	-3,000	-4,00	669,905	670,521	-0,616	4,00	3,000	670,641	4,500	670,701	5,167	670,256	-0,445						
2+170	-2,171	667,799	-7,757	669,970	-4,500	670,030	-3,000	-4,00	669,812	670,150	-0,338	4,00	3,000	670,270	4,500	670,330	4,755	670,160	-0,170						
2+180	-0,076	669,621	-4,614	669,697	-4,500	669,757	-3,000	-4,00	669,733	669,877	-0,144	4,00	3,000	669,997	4,500	670,057	4,650	669,957	-0,100						
2+189,586	0,041	669,522	-4,541	669,481	-4,500	669,541	-3,000	-4,00	669,711	669,661	0,050	4,00	3,000	669,781	4,500	669,841	4,710	670,051	0,210						
2+190	0,040	669,513	-4,540	669,473	-4,500	669,533	-3,000	-3,98	669,709	669,652	0,057	3,98	3,000	669,771	4,500	669,831	4,732	670,063	0,232						
2+200	0,004	669,274	-4,504	669,270	-4,500	669,323	-3,000	-3,48	669,564	669,427	0,137	3,48	3,000	669,531	4,500	669,584	5,069	670,153	0,569						
2+210	0,190	669,258	-4,690	669,068	-4,500	669,113	-3,000	-2,98	669,347	669,202	0,145	2,98	3,000	669,291	4,500	669,336	5,222	670,057	0,721						
2+219,586	0,195	669,069	-4,695	668,874	-4,500	668,911	-3,000	-2,50	669,150	668,986	0,164	2,50	3,000	669,061	4,500	669,099	5,133	669,732	0,633						

Estaca	Lado Esquerdo						Eixo						Lado Direito												
	Offset			Lateral			Bordo			Cota			Vermelha			Bordo			Lateral			Offset			
	Altura	Cota	Distância	Distância	Cota	Distância	%	Terreno	Projeto	Cota	%	Distância	Cota	Distância	Cota	Distância	Distância	Cota	Distância	Cota	Distância	Distância	Cota	Distância	Cota
2+220	0,190	669,058	-4,690	668,868	-4,500	668,904	-3,000	-2,43	669,141	668,977	0,164	2,43	3,000	669,050	4,500	669,086	5,132	669,718	0,632						
2+240	-1,142	667,201	-6,213	668,343	-4,500	668,329	-3,000	0,90	668,433	668,302	0,131	-0,90	3,000	668,275	4,500	668,261	5,170	668,931	0,670						
2+260	0,152	667,442	-4,652	667,290	-4,500	667,252	-3,000	2,50	667,847	667,177	0,670	-2,50	3,000	667,102	4,500	667,085	5,791	668,356	1,291						
2+267,512	0,365	667,116	-4,865	666,751	-4,500	666,713	-3,000	2,50	667,582	666,638	0,944	-2,50	3,000	666,563	4,500	666,526	6,136	668,162	1,636						
2+270	0,474	667,038	-4,974	666,564	-4,500	666,524	-3,000	2,62	667,440	666,446	0,994	-2,62	3,000	666,367	4,500	666,328	6,307	668,135	1,807						
2+280	0,872	666,615	-5,372	665,743	-4,500	665,696	-3,000	3,12	666,738	665,602	1,136	-3,12	3,000	665,508	4,500	665,461	7,023	667,984	2,523						
2+290	0,728	665,537	-5,228	664,809	-4,500	664,754	-3,000	3,62	665,848	664,646	1,202	-3,62	3,000	664,537	4,500	664,483	7,712	667,695	3,212						
2+297,512	0,735	664,768	-5,235	664,033	-4,500	663,973	-3,000	4,00	664,861	663,853	1,008	-4,00	3,000	663,733	4,500	663,673	7,896	667,068	3,395						
2+300	0,777	664,534	-5,277	663,757	-4,500	663,697	-3,000	4,00	664,767	663,577	1,190	-4,00	3,000	663,457	4,500	663,397	7,973	666,870	3,473						
2+310	0,747	663,323	-5,247	662,576	-4,500	662,516	-3,000	4,00	663,666	662,396	1,270	-4,00	3,000	662,276	4,500	662,216	8,486	666,202	3,986						
2+320	0,584	661,866	-5,084	661,282	-4,500	661,222	-3,000	4,00	661,576	661,102	0,474	-4,00	3,000	660,982	4,500	660,922	8,443	664,865	3,943						
2+330	0,470	660,402	-4,970	659,932	-4,500	659,872	-3,000	4,00	660,327	659,752	0,575	-4,00	3,000	659,632	4,500	659,572	7,917	662,989	3,417						
2+333,142	0,356	659,864	-4,857	659,508	-4,500	659,448	-3,000	4,00	659,900	659,328	0,572	-4,00	3,000	659,208	4,500	659,148	7,875	662,523	3,375						
2+340	0,193	658,738	-4,693	658,545	-4,500	658,497	-3,000	3,17	658,856	658,402	0,454	-3,17	3,000	658,307	4,500	658,259	7,540	661,299	3,040						
2+350	0,035	657,175	-4,535	657,140	-4,500	657,111	-3,000	1,96	657,335	657,052	0,283	-1,96	3,000	656,993	4,500	656,944	6,831	659,295	2,331						
2+360	-0,112	655,624	-4,667	655,736	-4,500	655,724	-3,000	0,75	655,945	655,702	0,243	-0,75	3,000	655,680	4,500	655,668	6,531	657,699	2,031						
2+366,152	0,072	654,943	-4,572	654,871	-4,500	654,871	-3,000	0,00	655,117	654,871	0,246	0,00	3,000	654,871	4,500	654,871	6,445	656,815	1,944						
2+370	0,172	654,502	-4,672	654,330	-4,500	654,338	-3,000	-0,48	654,628	654,352	0,276	0,48	3,000	654,366	4,500	654,374	6,326	656,200	1,826						
2+380	0,071	652,995	-4,571	652,924	-4,500	652,950	-3,000	-1,73	653,468	653,002	0,466	1,73	3,000	653,054	4,500	653,080	5,490	654,070	0,990						
2+390	-0,577	650,941	-5,365	651,518	-4,500	651,563	-3,000	-2,98	652,207	651,652	0,555	2,98	3,000	651,741	4,500	651,786	4,893	652,179	0,393						
2+398,152	0,293	650,664	-4,793	650,371	-4,500	650,431	-3,000	-4,00	651,350	650,551	0,799	4,00	3,000	650,671	4,500	650,731	5,653	651,884	1,153						
2+400	0,364	650,490	-4,864	650,126	-4,500	650,185	-3,000	-3,91	651,154	650,302	0,852	3,91	3,000	650,419	4,500	650,478	5,832	651,810	1,332						
2+410	0,689	649,436	-5,189	648,797	-4,500	648,849	-3,000	-3,44	650,052	648,952	1,100	3,44	3,000	649,055	4,500	649,107	6,705	651,312	2,205						
2+420	0,871	648,339	-5,371	647,468	-4,500	647,513	-3,000	-2,98	648,704	647,602	1,102	2,98	3,000	647,691	4,500	647,736	7,187	650,423	2,687						
2+430	1,021	647,160	-5,521	646,139	-4,500	646,177	-3,000	-2,51	647,310	646,252	1,058	2,51	3,000	646,327	4,500	646,365	7,510	649,375	3,010						
2+430,152	1,026	647,145	-5,526	646,119	-4,500	646,156	-3,000	-2,50	647,288	646,231	1,057	2,50	3,000	646,306	4,500	646,344	7,515	649,359	3,015						
2+440	1,427	646,217	-5,927	644,790	-4,500	644,827	-3,000	-2,50	645,906	644,902	1,004	2,50	3,000	644,977	4,500	645,015	7,759	648,274	3,259						
2+460	1,608	643,698	-6,108	642,090	-4,500	642,127	-3,000	-2,50	643,060	642,202	0,858	2,50	3,000	642,277	4,500	642,315	8,692	646,507	4,192						

Estaca	Lado Esquerdo						Eixo						Lado Direito												
	Offset			Lateral			Bordo			Cota			Cota Vermelha			Bordo			Lateral			Offset			
	Altura	Cota	Distância	Cota	Distância	Cota	Distância	%	Terreno	Projeto	Cota	Vermelha	%	Distância	Cota	Distância	Cota	Distância	Cota	Distância	Cota	Distância	Cota	Distância	Cota
2+472,789	1,247	641,610	-5,747	640,363	-4,500	640,400	-3,000	-2,50	641,089	640,475	0,614	2,50	3,000	640,550	4,500	640,588	7,465	643,553	2,965						
2+480	1,057	640,447	-5,557	639,390	-4,500	639,427	-3,000	-2,50	639,995	639,502	0,493	2,50	3,000	639,577	4,500	639,615	7,023	642,138	2,523						
2+500	0,785	637,475	-5,285	636,690	-4,500	636,727	-3,000	-2,50	637,293	636,802	0,491	2,50	3,000	636,877	4,500	636,915	6,657	639,072	2,157						
2+520	0,598	634,804	-5,098	634,206	-4,500	634,244	-3,000	-2,50	634,649	634,319	0,330	2,50	3,000	634,394	4,500	634,431	5,025	634,956	0,525						
2+540	0,424	632,580	-4,924	632,156	-4,500	632,194	-3,000	-2,50	632,191	632,269	-0,078	2,50	3,000	632,344	4,500	632,381	4,770	632,651	0,270						
2+560	0,083	630,623	-4,583	630,540	-4,500	630,577	-3,000	-2,50	630,527	630,652	-0,125	2,50	3,000	630,727	4,500	630,765	4,715	630,980	0,215						
2+580	0,062	629,418	-4,562	629,356	-4,500	629,394	-3,000	-2,50	629,420	629,469	-0,049	2,50	3,000	629,544	4,500	629,581	4,817	629,898	0,317						
2+600	0,309	628,915	-4,809	628,606	-4,500	628,644	-3,000	-2,50	628,826	628,719	0,107	2,50	3,000	628,794	4,500	628,831	4,809	629,140	0,309						
2+616,170	0,415	628,732	-4,915	628,317	-4,500	628,354	-3,000	-2,50	628,602	628,429	0,173	2,50	3,000	628,504	4,500	628,542	4,760	628,369	-0,173						
2+620	0,263	628,553	-4,764	628,290	-4,500	628,327	-3,000	-2,50	628,576	628,402	0,174	2,50	3,000	628,477	4,500	628,515	4,991	628,188	-0,327						
2+640	0,105	628,295	-4,605	628,190	-4,500	628,227	-3,000	-2,50	628,155	628,302	-0,147	2,50	3,000	628,377	4,500	628,415	5,102	628,014	-0,401						
2+660	-0,511	627,579	-5,267	628,090	-4,500	628,127	-3,000	-2,50	628,089	628,202	-0,113	2,50	3,000	628,277	4,500	628,315	5,154	627,879	-0,436						
2+680	-0,117	627,873	-4,675	627,990	-4,500	628,027	-3,000	-2,50	628,011	628,102	-0,091	2,50	3,000	628,177	4,500	628,215	5,368	627,636	-0,579						
2+700	0,156	628,046	-4,656	627,890	-4,500	627,927	-3,000	-2,50	628,438	628,002	0,436	2,50	3,000	628,077	4,500	628,115	4,551	628,081	-0,034						
2+720	0,337	628,127	-4,837	627,790	-4,500	627,827	-3,000	-2,50	628,198	627,902	0,296	2,50	3,000	627,977	4,500	628,015	4,602	627,947	-0,068						
2+740	0,738	628,398	-5,238	627,660	-4,500	627,697	-3,000	-2,50	628,165	627,772	0,393	2,50	3,000	627,847	4,500	627,885	4,656	628,041	0,156						
2+760	0,771	628,241	-5,271	627,470	-4,500	627,507	-3,000	-2,50	627,916	627,582	0,334	2,50	3,000	627,657	4,500	627,695	4,777	627,972	0,277						
2+780	1,415	628,635	-5,915	627,220	-4,500	627,257	-3,000	-2,50	627,496	627,332	0,164	2,50	3,000	627,407	4,500	627,445	4,745	627,690	0,245						
2+800	1,266	628,206	-5,766	626,940	-4,500	626,977	-3,000	-2,50	627,091	627,052	0,039	2,50	3,000	627,127	4,500	627,165	4,669	627,334	0,169						
2+820	1,126	627,786	-5,626	626,660	-4,500	626,697	-3,000	-2,50	626,807	626,772	0,035	2,50	3,000	626,847	4,500	626,885	4,503	626,888	0,003						
2+840	1,049	627,429	-5,549	626,380	-4,500	626,417	-3,000	-2,50	626,545	626,492	0,053	2,50	3,000	626,567	4,500	626,605	4,709	626,466	-0,139						
2+855	0,563	626,733	-5,064	626,170	-4,500	626,207	-3,000	-2,50	626,281	626,282	-0,001	2,50	3,000	626,357	4,500	626,395	5,123	625,980	-0,415						

## **CAPÍTULO 4 – ELEMENTOS PARA LOCAÇÃO**

## **4.1. Coordenadas do Eixo Projetado**



ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Coordenadas do Eixo Projetado

Estaca	PNH	PNV	Norte	Este	Cota	Az. Seção	Grade
0		V0	7.047.046,0908	286.975,4123	614,897	326°34'38"	614,897
0+10,000		PCV1	7.047.051,5989	286.983,7586		326°34'38"	614,782
0+20			7.047.057,1070	286.992,1049	614,743	326°34'38"	614,767
0+40			7.047.068,1232	287.008,7974	615,195	326°34'38"	615,333
0+44,483	TE1		7.047.070,5925	287.012,5390	615,603	326°34'38"	615,569
0+50			7.047.073,6248	287.017,1480	616,150	326°49'10"	615,914
0+60		PTV1	7.047.078,9942	287.025,5839	617,183	328°29'36"	616,695
0+70			7.047.083,9944	287.034,2423	618,216	331°45'31"	617,575
0+74,483	EC1		7.047.086,0489	287.038,2266	618,659	333°44'21"	617,970
0+80			7.047.088,3754	287.043,2286	619,049	336°22'24"	618,455
0+90			7.047.091,9970	287.052,5466	619,684	341°08'53"	619,335
0+100			7.047.094,8304	287.062,1339	620,363	345°55'22"	620,215
0+100,703	CE1		7.047.094,9994	287.062,8163	620,407	346°15'30"	620,277
0+110			7.047.096,8925	287.071,9168	620,952	350°00'35"	621,095
0+120			7.047.098,3892	287.081,8033	621,375	352°30'32"	621,975
0+130			7.047.099,5913	287.091,7308	621,987	353°24'59"	622,855
0+130,703	TE2		7.047.099,6719	287.092,4291	622,031	353°25'14"	622,917
0+135			7.047.100,1686	287.096,6973	622,301	353°14'51"	623,295
0+140			7.047.100,7806	287.101,6596	622,804	352°36'41"	623,735
0+145			7.047.101,4680	287.106,6122	623,310	351°30'26"	624,175
0+150		PCV2	7.047.102,2708	287.111,5471	623,819	349°56'07"	624,615
0+155			7.047.103,2287	287.116,4542	624,344	347°53'43"	625,040
0+160			7.047.104,3805	287.121,3193	624,883	345°23'14"	625,436
0+164,713	EC2		7.047.105,6773	287.125,8486	625,379	342°35'41"	625,781
0+165			7.047.105,7636	287.126,1223	625,409	342°24'43"	625,802
0+170			7.047.107,4060	287.130,8442	625,826	339°13'44"	626,138
0+175			7.047.109,3081	287.135,4675	626,128	336°02'45"	626,444
0+180			7.047.111,4640	287.139,9781	626,628	332°51'46"	626,721
0+185			7.047.113,8670	287.144,3621	627,002	329°40'47"	626,969
0+190			7.047.116,5098	287.148,6059	627,122	326°29'47"	627,186
0+195			7.047.119,3841	287.152,6964	627,425	323°18'48"	627,374
0+197,937	CE2		7.047.121,1768	287.155,0225	627,322	321°26'37"	627,471
0+200			7.047.122,4806	287.156,6212	627,156	320°10'32"	627,533
0+205			7.047.125,7750	287.160,3819	627,132	317°28'35"	627,662
0+210			7.047.129,2261	287.163,9995	627,137	315°18'29"	627,761
0+215			7.047.132,7956	287.167,5005	627,101	313°40'13"	627,830
0+220		PTV2	7.047.136,4480	287.170,9149	627,074	312°33'46"	627,870
0+227,937	ET2		7.047.142,3355	287.176,2379	627,094	311°53'40"	627,910
0+240			7.047.151,3148	287.184,2930	627,055	311°53'40"	627,970
0+260			7.047.166,2024	287.197,6482	626,804	311°53'40"	628,070
0+280			7.047.181,0899	287.211,0034	626,380	311°53'40"	628,170
0+300			7.047.195,9775	287.224,3586	626,684	311°53'40"	628,270
0+320			7.047.210,8650	287.237,7138	627,363	311°53'40"	628,370
0+340			7.047.225,7526	287.251,0690	628,044	311°53'40"	628,470
0+344,821	TE3		7.047.229,3410	287.254,2881	628,195	311°53'40"	628,494
0+350			7.047.233,2008	287.257,7412	628,322	311°39'41"	628,520
0+360			7.047.240,7567	287.264,2914	628,319	309°53'39"	628,570
0+370			7.047.248,6044	287.270,4864	628,197	306°23'26"	628,620

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Projeto: Tigrinhos - SC

Coordenadas do Eixo Projetado

Estaca	PNH	PNV	Norte	Este	Cota	Az. Seção	Grade
0+374,821	EC3		7.047.252,5402	287.273,2699	628,123	304°04'53"	628,644
0+380			7.047.256,8966	287.276,0702	628,055	301°23'01"	628,670
0+389,732	CE3		7.047.265,4183	287.280,7645	628,005	296°18'52"	628,719
0+390			7.047.265,6587	287.280,8830	628,004	296°10'31"	628,720
0+400			7.047.274,8000	287.284,9307	628,003	291°52'53"	628,770
0+410			7.047.284,1688	287.288,4257	628,118	289°19'25"	628,820
0+419,732	ET3		7.047.293,3828	287.291,5580	628,224	288°30'05"	628,869
0+420			7.047.293,6367	287.291,6430	628,227	288°30'05"	628,870
0+440			7.047.312,6030	287.297,9895	628,412	288°30'05"	628,970
0+460		PCV3	7.047.331,5693	287.304,3360	628,671	288°30'05"	629,070
0+480			7.047.350,5357	287.310,6825	629,032	288°30'05"	629,237
0+500			7.047.369,5020	287.317,0290	629,383	288°30'05"	629,537
0+520			7.047.388,4683	287.323,3755	630,002	288°30'05"	629,970
0+540			7.047.407,4347	287.329,7220	630,629	288°30'05"	630,537
0+560			7.047.426,4010	287.336,0685	631,170	288°30'05"	631,237
0+563,885	TE4		7.047.430,0849	287.337,3013	631,277	288°30'05"	631,388
0+570			7.047.435,8812	287.339,2497	631,456	288°44'22"	631,637
0+580		PTV3	7.047.445,3169	287.342,5616	631,753	290°09'17"	632,070
0+590			7.047.454,6268	287.346,2087	632,133	292°50'35"	632,520
0+593,885	EC4		7.047.458,1889	287.347,7591	632,290	294°13'51"	632,695
0+600			7.047.463,7127	287.350,3819	632,586	296°34'00"	632,970
0+610			7.047.472,5010	287.355,1489	633,112	300°23'11"	633,420
0+620		PCV4	7.047.480,9526	287.360,4910	633,665	304°12'22"	633,870
0+620,117	CE4		7.047.481,0492	287.360,5567	633,671	304°15'03"	633,875
0+630			7.047.489,0507	287.366,3555	634,167	307°24'14"	634,288
0+640			7.047.496,8796	287.372,5767	634,599	309°19'44"	634,640
0+650			7.047.504,5666	287.378,9723	635,034	309°58'49"	634,928
0+650,117	ET4		7.047.504,6562	287.379,0475	635,039	309°58'49"	634,931
0+660			7.047.512,2294	287.385,3977	635,469	309°58'49"	635,151
0+670			7.047.519,8919	287.391,8228	635,860	309°58'49"	635,310
0+673,545	TE5		7.047.522,6086	287.394,1009	635,921	309°58'49"	635,350
0+680			7.047.527,5588	287.398,2433	635,940	309°48'35"	635,403
0+690			7.047.535,2852	287.404,5919	635,966	308°52'20"	635,432
0+700			7.047.543,1581	287.410,7567	635,948	307°06'58"	635,396
0+710			7.047.551,2583	287.416,6197	635,820	304°32'29"	635,294
0+713,545	EC5		7.047.554,1974	287.418,6018	635,761	303°25'56"	635,243
0+720			7.047.559,6484	287.422,0578	635,615	301°19'08"	635,129
0+730			7.047.568,3354	287.427,0092	635,176	298°02'41"	634,898
0+740		PCCV5	7.047.577,2904	287.431,4560	634,635	294°46'15"	634,602
0+750			7.047.586,4853	287.435,3844	633,892	291°29'48"	634,304
0+760			7.047.595,8890	287.438,7810	633,224	288°13'22"	634,066
0+770			7.047.605,4720	287.441,6352	632,690	284°56'55"	633,888
0+780			7.047.615,2017	287.443,9373	632,515	281°40'29"	633,770
0+790			7.047.625,0476	287.445,6801	632,433	278°24'02"	633,711
0+800			7.047.634,9763	287.446,8576	632,463	275°07'36"	633,712
0+809,723	CE5		7.047.644,6796	287.447,4570	632,512	271°56'36"	633,771
0+810			7.047.644,9564	287.447,4662	632,513	271°51'10"	633,774
0+820			7.047.654,9552	287.447,5296	632,564	269°00'39"	633,895

ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Coordenadas do Eixo Projetado

Estaca	PNH	PNV	Norte	Este	Cota	Az. Seção	Grade
0+830			7.047.664,9482	287.447,1686	632,677	266°59'14"	634,076
0+840			7.047.674,9273	287.446,5261	632,897	265°46'55"	634,317
0+849,723	ET5		7.047.684,6206	287.445,7674	633,156	265°23'43"	634,608
0+860			7.047.694,8645	287.444,9423	633,398	265°23'43"	634,978
0+880			7.047.714,7999	287.443,3366	634,362	265°23'43"	635,879
0+900		PTV5	7.047.734,7353	287.441,7310	636,482	265°23'43"	637,019
0+920			7.047.754,6708	287.440,1253	638,973	265°23'43"	638,279
0+929,214	TE6		7.047.763,8552	287.439,3856	639,902	265°23'43"	638,859
0+930			7.047.764,6387	287.439,3225	639,949	265°23'52"	638,909
0+940			7.047.774,6087	287.438,5518	640,554	265°54'34"	639,539
0+950			7.047.784,5903	287.437,9472	641,202	267°18'17"	640,169
0+960			7.047.794,5854	287.437,6628	641,821	269°35'02"	640,799
0+969,214	EC6		7.047.803,7974	287.437,8176	642,344	272°28'00"	641,379
0+970			7.047.804,5826	287.437,8534	642,385	272°44'40"	641,429
0+980			7.047.814,5498	287.438,6399	642,899	276°16'48"	642,059
0+990			7.047.824,4499	287.440,0398	643,394	279°48'57"	642,689
1			7.047.834,2445	287.442,0474	643,871	283°21'05"	643,318
1+10			7.047.843,8970	287.444,6553	644,343	286°53'14"	643,948
1+20		PCV6	7.047.853,3699	287.447,8534	644,866	290°25'22"	644,578
1+30			7.047.862,6280	287.451,6298	645,428	293°57'31"	645,234
1+35,038	PC7		7.047.867,1991	287.453,7468	645,733	295°44'23"	645,585
1+40			7.047.871,6939	287.455,8487	646,032	294°23'08"	645,942
1+50			7.047.880,8966	287.459,7590	646,638	291°39'26"	646,702
1+60			7.047.890,2751	287.463,2270	647,158	288°55'44"	647,514
1+70			7.047.899,8078	287.466,2445	647,635	286°12'02"	648,378
1+80			7.047.909,4736	287.468,8049	648,190	283°28'20"	649,294
1+81,326	CE7		7.047.910,7635	287.469,1096	648,323	283°06'38"	649,420
1+90			7.047.919,2470	287.470,9148	649,188	281°00'02"	650,262
1+100			7.047.929,0930	287.472,6590	650,445	279°12'18"	651,282
1+110			7.047.938,9809	287.474,1529	652,034	278°05'29"	652,354
1+120		PTV6	7.047.948,8877	287.475,5133	653,419	277°39'35"	653,478
1+121,326	ET7		7.047.950,2021	287.475,6900	653,584	277°39'14"	653,631
1+128,034	TE8		7.047.956,8501	287.476,5833	654,416	277°39'14"	654,402
1+130			7.047.958,7986	287.476,8455	654,660	277°40'45"	654,628
1+140			7.047.968,7003	287.478,2421	655,756	278°35'48"	655,778
1+150			7.047.978,5597	287.479,9104	656,701	280°49'53"	656,928
1+158,034	EC8		7.047.986,4134	287.481,5992	657,602	283°34'51"	657,852
1+160			7.047.988,3211	287.482,0737	657,842	284°21'28"	658,078
1+170			7.047.997,9157	287.484,8855	659,057	288°18'33"	659,228
1+180			7.048.007,2936	287.488,3517	660,073	292°15'38"	660,378
1+190			7.048.016,4104	287.492,4559	661,060	296°12'44"	661,528
1+200			7.048.025,2226	287.497,1786	662,065	300°09'49"	662,678
1+210			7.048.033,6886	287.502,4974	662,947	304°06'54"	663,828
1+220			7.048.041,7678	287.508,3868	664,264	308°03'59"	664,978
1+230			7.048.049,4221	287.514,8191	665,974	312°01'04"	666,128
1+240			7.048.056,6148	287.521,7634	667,718	315°58'09"	667,278
1+250			7.048.063,3119	287.529,1870	668,164	319°55'15"	668,428
1+260			7.048.069,4815	287.537,0544	669,591	323°52'20"	669,578

ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Coordenadas do Eixo Projetado

Estaca	PNH	PNV	Norte	Este	Cota	Az. Seção	Grade
1+263,463	CE8		7.048.071,4897	287.539,8756	669,880	325°14'26"	669,977
1+270			7.048.075,1034	287.545,3225	670,423	327°32'32"	670,728
1+280			7.048.080,2731	287.553,8815	671,128	329°58'26"	671,878
1+290			7.048.085,1758	287.562,5971	672,211	331°05'19"	673,028
1+293,463	ET8		7.048.086,8472	287.565,6301	672,589	331°10'04"	673,427
1+300			7.048.089,9996	287.571,3566	673,362	331°10'04"	674,178
1+315,924	TE9		7.048.097,6791	287.585,3069	675,499	331°10'04"	676,010
1+320			7.048.099,6413	287.588,8791	676,096	331°19'35"	676,478
1+325			7.048.102,0195	287.593,2776	676,895	331°57'15"	677,053
1+330			7.048.104,3307	287.597,7113	677,707	333°03'35"	677,628
1+335			7.048.106,5373	287.602,1979	678,502	334°38'33"	678,203
1+340		PCV7	7.048.108,6000	287.606,7520	679,180	336°42'10"	678,778
1+345			7.048.110,4785	287.611,3856	679,869	339°14'27"	679,345
1+345,924	EC9		7.048.110,8021	287.612,2510	679,997	339°45'43"	679,447
1+350			7.048.112,1337	287.616,1031	680,569	342°05'51"	679,894
1+355			7.048.113,5511	287.620,8974	681,005	344°57'44"	680,426
1+360			7.048.114,7271	287.625,7563	681,424	347°49'37"	680,940
1+365			7.048.115,6589	287.630,6685	681,849	350°41'30"	681,438
1+370			7.048.116,3440	287.635,6208	682,280	353°33'24"	681,918
1+375			7.048.116,7807	287.640,6012	682,572	356°25'17"	682,381
1+380			7.048.116,9679	287.645,5969	682,828	359°17'10"	682,827
1+385			7.048.116,9052	287.650,5962	683,099	2°09'03"	683,255
1+390			7.048.116,5927	287.655,5860	683,388	5°00'57"	683,666
1+395			7.048.116,0313	287.660,5538	683,712	7°52'50"	684,060
1+400		PTV7	7.048.115,2223	287.665,4871	684,041	10°44'43"	684,437
1+403,472	CE9		7.048.114,5158	287.668,8867	684,274	12°44'05"	684,692
1+405			7.048.114,1678	287.670,3745	684,378	13°35'16"	684,805
1+410			7.048.112,8849	287.675,2068	684,722	16°04'05"	685,173
1+415			7.048.111,4140	287.679,9853	685,239	18°04'15"	685,541
1+420			7.048.109,7968	287.684,7159	685,779	19°35'45"	685,909
1+425			7.048.108,0735	287.689,4099	686,322	20°38'37"	686,277
1+430			7.048.106,2843	287.694,0788	686,860	21°12'50"	686,645
1+433,472	ET9		7.048.105,0236	287.697,3138	687,066	21°19'45"	686,901
1+440			7.048.102,6493	287.703,3943	687,452	21°19'45"	687,382
1+460			7.048.095,3749	287.722,0245	688,969	21°19'45"	688,854
1+464,147	TE10		7.048.093,8665	287.725,8875	689,352	21°19'45"	689,159
1+470			7.048.091,7435	287.731,3419	689,891	21°08'32"	689,590
1+480			7.048.088,2185	287.740,6998	690,826	19°57'28"	690,326
1+490			7.048.084,9778	287.750,1594	691,740	17°40'55"	691,063
1+494,147	EC10		7.048.083,7608	287.754,1237	691,902	16°25'05"	691,368
1+500			7.048.082,2007	287.759,7647	692,127	14°30'06"	691,799
1+510			7.048.079,9745	287.769,5123	692,492	11°13'40"	692,535
1+520			7.048.078,3086	287.779,3712	692,980	7°57'13"	693,271
1+530			7.048.077,2086	287.789,3092	693,515	4°40'46"	694,007
1+540		PCV8	7.048.076,6778	287.799,2937	694,323	1°24'20"	694,743
1+550			7.048.076,7182	287.809,2923	695,161	358°07'53"	695,518
1+552,570	CE10		7.048.076,8209	287.811,8605	695,399	357°17'24"	695,730
1+560			7.048.077,3182	287.819,2731	696,084	355°07'24"	696,370

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Projeto: Tigrinhos - SC

Coordenadas do Eixo Projetado

Estaca	PNH	PNV	Norte	Este	Cota	Az. Seção	Grade
1+570			7.048.078,3626	287.829,2181	697,013	353°02'46"	697,300
1+580			7.048.079,6836	287.839,1300	698,020	351°55'55"	698,307
1+586,570	TE11		7.048.080,6215	287.845,6330	698,669	351°43'27"	699,010
1+590			7.048.081,1094	287.849,0282	699,056	352°01'07"	699,391
1+595			7.048.081,7485	287.853,9870	699,619	353°30'07"	699,962
1+600		PTV8	7.048.082,2047	287.858,9654	700,177	356°14'10"	700,552
1+605			7.048.082,3682	287.863,9620	700,747	0°13'18"	701,152
1+610			7.048.082,1297	287.868,9546	701,334	5°27'28"	701,752
1+615			7.048.081,3827	287.873,8957	701,894	11°56'41"	702,352
1+620		PCV9	7.048.080,0300	287.878,7050	702,327	19°40'56"	702,952
1+620,250	EC11		7.048.079,9448	287.878,9401	702,346	20°06'09"	702,982
1+625			7.048.078,0065	287.883,2724	702,509	28°06'25"	703,517
1+630			7.048.075,3357	287.887,4940	703,699	36°31'58"	704,010
1+635			7.048.072,0751	287.891,2786	705,045	44°57'31"	704,433
1+636,610	CE11		7.048.070,9114	287.892,3901	705,363	47°40'14"	704,554
1+640			7.048.068,2993	287.894,5495	706,000	53°03'41"	704,785
1+645			7.048.064,1296	287.897,3027	706,803	59°49'58"	705,067
1+650			7.048.059,6908	287.899,6002	707,261	65°12'04"	705,277
1+655			7.048.055,0790	287.901,5294	707,484	69°09'56"	705,417
1+660			7.048.050,3640	287.903,1932	707,670	71°43'35"	705,485
1+665			7.048.045,5979	287.904,7031	707,818	72°52'58"	705,483
1+666,620	TE12		7.048.044,0492	287.905,1786	707,712	72°57'24"	705,467
1+670			7.048.040,8186	287.906,1723	707,183	72°47'47"	705,410
1+675			7.048.036,0516	287.907,6806	706,694	71°58'14"	705,267
1+680			7.048.031,3163	287.909,2867	706,554	70°26'33"	705,052
1+685			7.048.026,6371	287.911,0468	706,378	68°12'45"	704,767
1+690			7.048.022,0417	287.913,0159	706,188	65°16'49"	704,410
1+695			7.048.017,5670	287.915,2448	705,886	61°38'46"	703,983
1+696,620	EC12		7.048.016,1497	287.916,0307	705,703	60°19'04"	703,830
1+700			7.048.013,2556	287.917,7769	705,308	57°28'10"	703,485
1+705			7.048.009,1430	287.920,6179	704,660	53°15'25"	702,917
1+710		PTV9	7.048.005,2499	287.923,7536	704,024	49°02'39"	702,277
1+715			7.048.001,5977	287.927,1668	703,386	44°49'52"	701,602
1+720			7.047.998,2058	287.930,8394	702,684	40°37'04"	700,927
1+725			7.047.995,0934	287.934,7506	701,612	36°24'19"	700,252
1+730			7.047.992,2765	287.938,8802	700,766	32°11'32"	699,577
1+734,182	CE12		7.047.990,1584	287.942,4860	700,024	28°40'06"	699,012
1+735			7.047.989,7703	287.943,2061	699,917	27°59'18"	698,902
1+740			7.047.987,5745	287.947,6969	699,127	24°14'29"	698,227
1+745			7.047.985,6483	287.952,3106	698,331	21°11'48"	697,552
1+750			7.047.983,9410	287.957,0097	697,475	18°51'14"	696,877
1+755			7.047.982,3981	287.961,7655	696,578	17°12'48"	696,202
1+760			7.047.980,9625	287.966,5547	696,694	16°16'30"	695,527
1+764,182	ET12		7.047.979,8020	287.970,5726	695,943	16°01'46"	694,962
1+780			7.047.975,4342	287.985,7754	692,788	16°01'46"	692,827
1+800			7.047.969,9116	288.004,9978	689,193	16°01'46"	690,127
1+820			7.047.964,3889	288.024,2202	685,894	16°01'46"	687,427
1+840			7.047.958,8663	288.043,4426	684,142	16°01'46"	684,727

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Projeto: Tigrinhos - SC

Coordenadas do Eixo Projetado

Estaca	PNH	PNV	Norte	Este	Cota	Az. Seção	Grade
1+860		PCV10	7.047.953,3437	288.062,6650	681,747	16°01'46"	682,027
1+880			7.047.947,8211	288.081,8874	678,710	16°01'46"	679,652
1+900			7.047.942,2985	288.101,1098	676,333	16°01'46"	677,927
1+901,184	TE13		7.047.941,9715	288.102,2479	676,224	16°01'46"	677,845
1+910			7.047.939,5188	288.110,7159	676,140	16°24'02"	677,308
1+920			7.047.936,5984	288.120,2796	676,038	17°43'11"	676,852
1+930			7.047.933,3797	288.129,7468	676,011	19°59'39"	676,558
1+931,184	EC13		7.047.932,9717	288.130,8583	676,013	20°19'36"	676,534
1+940			7.047.929,7281	288.139,0551	675,994	22°51'08"	676,427
1+950			7.047.925,6158	288.148,1693	676,307	25°43'01"	676,458
1+960			7.047.921,0532	288.157,0665	676,632	28°34'54"	676,652
1+970			7.047.916,0515	288.165,7247	677,354	31°26'48"	677,008
1+971,091	CE13		7.047.915,4801	288.166,6535	677,442	31°45'32"	677,057
1+980		PCCV11	7.047.910,6398	288.174,1329	678,202	33°55'56"	677,527
1+990			7.047.904,9359	288.182,3457	678,795	35°28'08"	678,060
2			7.047.899,0806	288.190,4527	679,427	36°03'02"	678,460
2+1,091	ET13		7.047.898,4387	288.191,3344	679,493	36°03'22"	678,496
2+20			7.047.887,3091	288.206,6215	679,898	36°03'22"	678,860
2+40			7.047.875,5375	288.222,7903	679,828	36°03'22"	678,727
2+60			7.047.863,7659	288.238,9591	679,321	36°03'22"	678,060
2+66,325	TE14		7.047.860,0434	288.244,0722	679,006	36°03'22"	677,739
2+70			7.047.857,8792	288.247,0423	678,815	36°07'40"	677,527
2+80			7.047.851,9308	288.255,0811	678,265	37°02'54"	676,860
2+90			7.047.845,7815	288.262,9658	677,222	39°01'47"	676,060
2+96,325	EC14		7.047.841,7250	288.267,8183	676,571	40°49'51"	675,486
2+100		PCCV12	7.047.839,2937	288.270,5746	676,184	42°00'03"	675,127
2+110			7.047.832,3996	288.277,8160	674,560	45°11'01"	674,175
2+120			7.047.825,1135	288.284,6640	673,000	48°22'01"	673,321
2+126,168	PC15		7.047.820,4342	288.288,6819	672,314	50°19'49"	672,842
2+130			7.047.817,5106	288.291,1591	671,813	49°07'15"	672,563
2+140			7.047.810,1337	288.297,9086	670,819	45°57'54"	671,902
2+150			7.047.803,1396	288.305,0540	670,274	42°48'33"	671,338
2+160			7.047.796,5494	288.312,5736	669,905	39°39'13"	670,871
2+170			7.047.790,3832	288.320,4446	669,812	36°29'52"	670,500
2+180		PTV12	7.047.784,6596	288.328,6431	669,733	33°20'31"	670,227
2+189,586	CE15		7.047.779,6050	288.336,7859	669,711	30°19'02"	670,011
2+190			7.047.779,3964	288.337,1436	669,709	30°11'15"	670,002
2+200			7.047.774,5782	288.345,9054	669,564	27°36'04"	669,777
2+210			7.047.770,0780	288.354,8351	669,347	26°04'01"	669,552
2+219,586	ET15		7.047.765,9142	288.363,4696	669,150	25°35'01"	669,336
2+220		PCV13	7.047.765,7354	288.363,8431	669,141	25°35'01"	669,327
2+240			7.047.757,0989	288.381,8822	668,433	25°35'01"	668,652
2+260			7.047.748,4624	288.399,9214	667,847	25°35'01"	667,527
2+267,512	TE16		7.047.745,2186	288.406,6966	667,582	25°35'01"	666,988
2+270			7.047.744,1437	288.408,9405	667,440	25°37'23"	666,796
2+280			7.047.739,7610	288.417,9290	666,738	26°34'35"	665,952
2+290			7.047.735,1309	288.426,7916	665,848	28°48'11"	664,996
2+297,512	EC16		7.047.731,3755	288.433,2968	664,861	31°18'47"	664,203

ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Coordenadas do Eixo Projetado

Estaca	PNH	PNV	Norte	Este	Cota	Az. Seção	Grade
2+300			7.047.730,0647	288.435,4117	664,767	32°15'49"	663,927
2+310			7.047.724,4489	288.443,6835	663,666	36°04'59"	662,746
2+320		PTV13	7.047.718,2943	288.451,5630	661,576	39°54'11"	661,452
2+330			7.047.711,6286	288.459,0148	660,327	43°43'21"	660,102
2+333,142	CE16		7.047.709,4335	288.461,2625	659,900	44°55'22"	659,678
2+340			7.047.704,4885	288.466,0141	658,856	47°16'13"	658,752
2+350			7.047.696,9894	288.472,6278	657,335	49°43'04"	657,402
2+360			7.047.689,2775	288.478,9941	655,945	51°00'30"	656,052
2+366,152	TE17		7.047.684,4864	288.482,8526	655,117	51°13'38"	655,221
2+370			7.047.681,4874	288.485,2636	654,628	51°09'12"	654,702
2+380			7.047.673,7382	288.491,5847	653,468	50°16'18"	653,352
2+390			7.047.666,1443	288.498,0898	652,207	48°23'38"	652,002
2+398,152	TS17		7.047.660,1519	288.503,6165	651,350	46°07'31"	650,901
2+400			7.047.658,8249	288.504,9054	651,154	45°33'11"	650,652
2+410			7.047.651,8520	288.512,0716	650,052	43°02'49"	649,302
2+420			7.047.645,1335	288.519,4787	648,704	41°32'14"	647,952
2+430			7.047.638,5472	288.527,0028	647,310	41°01'26"	646,602
2+430,152	ET17		7.047.638,4474	288.527,1174	647,288	41°01'25"	646,581
2+440			7.047.631,9832	288.534,5474	645,906	41°01'25"	645,252
2+460			7.047.618,8558	288.549,6362	643,060	41°01'25"	642,552
2+472,789	PC18		7.047.610,4618	288.559,2843	641,089	41°01'25"	640,825
2+480			7.047.605,7383	288.564,7334	639,995	40°49'02"	639,852
2+500		PCV14	7.047.592,7412	288.579,9345	637,293	40°14'39"	637,152
2+520			7.047.579,8968	288.595,2648	634,649	39°40'16"	634,669
2+540			7.047.567,2064	288.610,7228	632,191	39°05'54"	632,619
2+560			7.047.554,6712	288.626,3069	630,527	38°31'31"	631,002
2+580			7.047.542,2924	288.642,0156	629,420	37°57'08"	629,819
2+600			7.047.530,0713	288.657,8473	628,826	37°22'46"	629,069
2+616,170	PT18		7.047.520,3066	288.670,7363	628,602	36°54'58"	628,779
2+620		PTV14	7.047.518,0063	288.673,7982	628,576	36°54'58"	628,752
2+640			7.047.505,9934	288.689,7885	628,155	36°54'58"	628,652
2+660			7.047.493,9804	288.705,7789	628,089	36°54'58"	628,552
2+680			7.047.481,9675	288.721,7692	628,011	36°54'58"	628,452
2+700			7.047.469,9546	288.737,7595	628,438	36°54'58"	628,352
2+720		PCV15	7.047.457,9417	288.753,7498	628,198	36°54'58"	628,252
2+740			7.047.445,9288	288.769,7401	628,165	36°54'58"	628,122
2+760			7.047.433,9159	288.785,7304	627,916	36°54'58"	627,932
2+780		PTV15	7.047.421,9030	288.801,7207	627,496	36°54'58"	627,682
2+800			7.047.409,8901	288.817,7110	627,091	36°54'58"	627,402
2+820			7.047.397,8772	288.833,7013	626,807	36°54'58"	627,122
2+840			7.047.385,8643	288.849,6916	626,545	36°54'58"	626,842
2+855		V16	7.047.376,8547	288.861,6842	626,281	36°54'58"	626,632

## **4.2. Elementos do Projeto Geométrico Horizontal**



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Projeto: Tigrinhos - SC

Projeto Geométrico Horizontal

Nome	Estaca	Norte	Este	Linha	Raio	Parâmetro	AC/AZ	Extensão
PI-0	0	7.047.046,0908	286.975,4123					
				TANG	-	-	56°34'38"	44,483
TE1	0+44,483	7.047.070,5925	287.012,5390					
				ESP	120,000	60,000	7°09'43"	30,000
EC1	0+74,483	7.047.086,0489	287.038,2266					
				CIRC	120,000	-	12°31'09"	26,220
CE1	0+100,703	7.047.094,9994	287.062,8163					
				ESP	120,000	60,000	7°09'43"	30,000
TE2	0+130,703	7.047.099,6719	287.092,4291					
				ESP	90,000	55,325	10°49'33"	34,010
EC2	0+164,713	7.047.105,6773	287.125,8486					
				CIRC	90,000	-	21°09'04"	33,224
CE2	0+197,937	7.047.121,1768	287.155,0225					
				ESP	90,000	51,962	9°32'57"	30,000
ET2	0+227,937	7.047.142,3355	287.176,2379					
				TANG	-	-	41°53'40"	116,884
TE3	0+344,821	7.047.229,3410	287.254,2881					
				ESP	110,000	57,446	7°48'47"	30,000
EC3	0+374,821	7.047.252,5402	287.273,2699					
				CIRC	110,000	-	7°46'01"	14,912
CE3	0+389,732	7.047.265,4183	287.280,7645					
				ESP	110,000	57,446	7°48'47"	30,000
ET3	0+419,732	7.047.293,3828	287.291,5580					
				TANG	-	-	18°30'05"	144,152
TE4	0+563,885	7.047.430,0849	287.337,3013					
				ESP	150,000	67,082	5°43'46"	30,000
EC4	0+593,885	7.047.458,1889	287.347,7591					
				CIRC	150,000	-	10°01'12"	26,232
CE4	0+620,117	7.047.481,0492	287.360,5567					
				ESP	150,000	67,082	5°43'46"	30,000
ET4	0+650,117	7.047.504,6562	287.379,0475					
				TANG	-	-	39°58'49"	23,428
TE5	0+673,545	7.047.522,6086	287.394,1009					
				ESP	175,000	83,666	6°32'53"	40,000
EC5	0+713,545	7.047.554,1974	287.418,6018					
				CIRC	175,000	-	31°29'20"	96,178
CE5	0+809,723	7.047.644,6796	287.447,4570					
				ESP	175,000	83,666	6°32'53"	40,000
ET5	0+849,723	7.047.684,6206	287.445,7674					
				TANG	-	-	355°23'43"	79,491
TE6	0+929,214	7.047.763,8552	287.439,3856					
				ESP	162,050	80,511	7°04'17"	40,000
EC6	0+969,214	7.047.803,7974	287.437,8176					
				CIRC	162,050	-	23°16'24"	65,824
PC7	1+35,038	7.047.867,1991	287.453,7468					
				CIRC	210,000	-	12°37'45"	46,288
CE7	1+81,326	7.047.910,7635	287.469,1096					
				ESP	210,000	91,652	5°27'24"	40,000

ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Projeto Geométrico Horizontal

Nome	Estaca	Norte	Este	Linha	Raio	Parâmetro	AC/AZ	Extensão
ET7	1+121,326	7.047.950,2021	287.475,6900					
				TANG	-	-	7°39'14"	6,708
TE8	1+128,034	7.047.956,8501	287.476,5833					
				ESP	145,000	65,955	5°55'38"	30,000
EC8	1+158,034	7.047.986,4134	287.481,5992					
				CIRC	145,000	-	41°39'34"	105,429
CE8	1+263,463	7.048.071,4897	287.539,8756					
				ESP	145,000	65,955	5°55'38"	30,000
ET8	1+293,463	7.048.086,8472	287.565,6301					
				TANG	-	-	61°10'04"	22,461
TE9	1+315,924	7.048.097,6791	287.585,3069					
				ESP	100,000	54,772	8°35'40"	30,000
EC9	1+345,924	7.048.110,8021	287.612,2510					
				CIRC	100,000	-	32°58'22"	57,548
CE9	1+403,472	7.048.114,5158	287.668,8867					
				ESP	100,000	54,772	8°35'40"	30,000
ET9	1+433,472	7.048.105,0236	287.697,3138					
				TANG	-	-	111°19'45"	30,675
TE10	1+464,147	7.048.093,8665	287.725,8875					
				ESP	175,000	72,457	4°54'40"	30,000
EC10	1+494,147	7.048.083,7608	287.754,1237					
				CIRC	175,000	-	19°07'41"	58,423
CE10	1+552,570	7.048.076,8209	287.811,8605					
				ESP	175,000	77,136	5°33'57"	34,000
TE11	1+586,570	7.048.080,6215	287.845,6330					
				ESP	34,000	33,840	28°22'42"	33,680
EC11	1+620,250	7.048.079,9448	287.878,9401					
				CIRC	34,000	-	27°34'06"	16,359
CE11	1+636,610	7.048.070,9114	287.892,3901					
				ESP	34,000	31,943	25°17'10"	30,010
TE12	1+666,620	7.048.044,0492	287.905,1786					
				ESP	68,000	45,166	12°38'20"	30,000
EC12	1+696,620	7.048.016,1497	287.916,0307					
				CIRC	68,000	-	31°38'59"	37,563
CE12	1+734,182	7.047.990,1584	287.942,4860					
				ESP	68,000	45,166	12°38'20"	30,000
ET12	1+764,182	7.047.979,8020	287.970,5726					
				TANG	-	-	106°01'46"	137,002
TE13	1+901,184	7.047.941,9715	288.102,2479					
				ESP	200,000	77,460	4°17'50"	30,000
EC13	1+931,184	7.047.932,9717	288.130,8583					
				CIRC	200,000	-	11°25'57"	39,907
CE13	1+971,091	7.047.915,4801	288.166,6535					
				ESP	200,000	77,460	4°17'50"	30,000
ET13	2+1,091	7.047.898,4387	288.191,3344					
				TANG	-	-	126°03'22"	65,234
TE14	2+66,325	7.047.860,0434	288.244,0722					
				ESP	180,000	73,485	4°46'29"	30,000

ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Projeto Geométrico Horizontal

Nome	Estaca	Norte	Este	Linha	Raio	Parâmetro	AC/AZ	Extensão
EC14	2+96,325	7.047.841,7250	288.267,8183					
				CIRC	180,000	-	9°29'58"	29,843
PC15	2+126,168	7.047.820,4342	288.288,6819					
				CIRC	181,560	-	20°00'47"	63,418
CE15	2+189,586	7.047.779,6050	288.336,7859					
				ESP	181,560	73,802	4°44'01"	30,000
ET15	2+219,586	7.047.765,9142	288.363,4696					
				TANG	-	-	115°35'01"	47,926
TE16	2+267,512	7.047.745,2186	288.406,6966					
				ESP	150,000	67,082	5°43'46"	30,000
EC16	2+297,512	7.047.731,3755	288.433,2968					
				CIRC	150,000	-	13°36'35"	35,630
CE16	2+333,142	7.047.709,4335	288.461,2625					
				ESP	150,000	70,367	6°18'16"	33,010
TE17	2+366,152	7.047.684,4864	288.482,8526					
				ESP	179,700	75,831	5°06'05"	32,000
TS17	2+398,152	7.047.660,1519	288.503,6165					
				ESP	179,700	75,831	5°06'05"	32,000
ET17	2+430,152	7.047.638,4474	288.527,1174					
				TANG	-	-	131°01'25"	42,637
PC18	2+472,789	7.047.610,4618	288.559,2843					
				CIRC	2.000,000	-	4°06'27"	143,382
PT18	2+616,170	7.047.520,3066	288.670,7363					
				TANG	-	-	126°54'58"	238,830
PI-19	2+855,000	7.047.376,8547	288.861,6842					

### **4.3. Elementos do Projeto Geométrico Vertical**

Nome	Estaca	Cota	Rampa (%)	Raio Vertical	Extensão
V0	0	614,897			
			-1,148	-	10,000
PCV1	0+10,000	614,782			
			Parábola	502,595	50,000
PTV1	0+60,000	616,695			
			8,800	-	90,000
PCV2	0+150,000	624,615			
			Parábola	-843,373	70,000
PTV2	0+220,000	627,870			
			0,500	-	240,000
PCV3	0+460,000	629,070			
			Parábola	3.000,000	120,000
PTV3	0+580,000	632,070			
			4,500	-	40,000
PCV4	0+620,000	633,870			
			Parábola	-1.542,558	120,000
PCCV5	0+740,000	634,602			
			Parábola	1.670,319	160,000
PTV5	0+900,000	637,019			
			6,300	-	120,000
PCV6	1+20,000	644,578			
			Parábola	1.922,973	100,000
PTV6	1+120,000	653,478			
			11,500	-	220,000
PCV7	1+340,000	678,778			
			Parábola	-1.449,925	60,000
PTV7	1+400,000	684,437			
			7,362	-	140,000
PCV8	1+540,000	694,743			
			Parábola	1.293,620	60,000
PTV8	1+600,000	700,552			
			12,000	-	20,000
PCV9	1+620,000	702,952			
			Parábola	-352,941	90,000
PTV9	1+710,000	702,277			
			-13,500	-	150,000
PCV10	1+860,000	682,027			
			Parábola	615,385	120,000
PCCV11	1+980,000	677,527			
			Parábola	-750,000	120,000
PCCV12	2+100,000	675,127			
			Parábola	1.032,258	80,000
PTV12	2+180,000	670,227			
			-2,250	-	40,000
PCV13	2+220,000	669,327			
			Parábola	-888,889	100,000
PTV13	2+320,000	661,452			
			-13,500	-	180,000

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Nome	Estaca	Cota	Rampa (%)	Raio Vertical	Extensão
PCV14	2+500,000	637,152			
			Parábola	923,077	120,000
PTV14	2+620,000	628,752			
			-0,500	-	100,000
PCV15	2+720,000	628,252			
			Parábola	-6.666,667	60,000
PTV15	2+780,000	627,682			
			-1,400	-	75,000
V16	2+855,000	626,632			

## **CAPÍTULO 5 – CÁLCULO DOS VOLUMES DE TERRAPLENAGEM**

ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
0	2,161	0,000					
			5,000	20,215	20,215	0,000	0,000
0+10,000	1,882	0,000					
			5,000	17,265	37,480	0,000	0,000
0+20	1,571	0,000					
			10,000	24,940	62,420	0,000	0,000
0+40	0,923	0,000					
			2,242	7,626	70,046	0,000	0,000
0+44,483	2,479	0,000					
			2,759	17,820	87,866	0,000	0,000
0+50	3,981	0,000					
			5,000	49,440	137,306	0,000	0,000
0+60	5,907	0,000					
			5,000	69,270	206,576	0,000	0,000
0+70	7,947	0,000					
			2,242	36,985	243,561	0,000	0,000
0+74,483	8,553	0,000					
			2,759	45,239	288,800	0,000	0,000
0+80	7,847	0,000					
			5,000	72,090	360,890	0,000	0,000
0+90	6,571	0,000					
			5,000	48,745	409,635	0,000	0,000
0+100	3,178	0,000					
			0,352	2,149	411,784	0,000	0,000
0+100,703	2,937	0,000					
			4,649	13,653	425,437	0,270	0,270
0+110	0,000	0,058					
			5,000	0,000	425,437	20,120	20,390
0+120	0,000	3,966					
			5,000	0,000	425,437	54,350	74,740
0+130	0,000	6,904					
			0,352	0,000	425,437	4,926	79,666
0+130,703	0,000	7,111					
			2,149	0,000	425,437	33,212	112,878
0+135	0,000	8,347					
			2,500	0,000	425,437	41,140	154,018
0+140	0,000	8,109					
			2,500	0,000	425,437	39,365	193,383
0+145	0,000	7,637					
			2,500	0,000	425,437	36,345	229,728
0+150	0,000	6,901					
			2,500	0,215	425,652	31,122	260,850
0+155	0,086	5,548					
			2,500	1,092	426,744	23,005	283,855
0+160	0,351	3,654					



ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
0+160	0,351	3,654					
			2,357	1,845	428,589	11,570	295,425
0+164,713	0,432	1,256					
			0,144	0,123	428,712	0,340	295,765
0+165	0,427	1,115					
			2,500	2,697	431,409	3,327	299,092
0+170	0,652	0,216					
			2,500	3,960	435,369	0,593	299,685
0+175	0,932	0,021					
			2,500	4,060	439,429	1,590	301,275
0+180	0,692	0,615					
			2,500	3,240	442,669	5,735	307,010
0+185	0,604	1,679					
			2,500	3,515	446,184	11,395	318,405
0+190	0,802	2,879					
			2,500	3,487	449,671	12,500	330,905
0+195	0,593	2,121					
			1,469	1,893	451,564	5,798	336,703
0+197,937	0,696	1,827					
			1,032	1,087	452,651	3,892	340,595
0+200	0,358	1,946					
			2,500	0,922	453,573	13,403	353,998
0+205	0,011	3,415					
			2,500	0,027	453,600	22,112	376,110
0+210	0,000	5,430					
			2,500	0,000	453,600	33,197	409,307
0+215	0,000	7,849					
			2,500	0,000	453,600	46,015	455,322
0+220	0,000	10,557					
			3,969	0,000	453,600	75,989	531,311
0+227,937	0,000	8,591					
			6,032	0,000	453,600	96,594	627,905
0+240	0,000	7,424					
			10,000	6,050	459,650	138,450	766,355
0+260	0,605	6,421					
			10,000	6,050	465,700	204,900	971,255
0+280	0,000	14,069					
			10,000	0,000	465,700	293,260	1.264,515
0+300	0,000	15,257					
			10,000	4,250	469,950	210,460	1.474,975
0+320	0,425	5,789					
			10,000	4,250	474,200	61,140	1.536,115
0+340	0,000	0,325					
			2,411	0,000	474,200	0,783	1.536,898
0+344,821	0,000	0,000					

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
0+344,821	0,000	0,000					
			2,590	0,451	474,651	0,000	1.536,898
0+350	0,174	0,000					
			5,000	0,870	475,521	4,750	1.541,648
0+360	0,000	0,950					
			5,000	0,000	475,521	18,310	1.559,958
0+370	0,000	2,712					
			2,411	0,000	475,521	14,702	1.574,660
0+374,821	0,000	3,387					
			2,590	0,000	475,521	19,647	1.594,307
0+380	0,000	4,200					
			4,866	0,000	475,521	45,706	1.640,013
0+389,732	0,000	5,193					
			0,134	0,000	475,521	1,395	1.641,408
0+390	0,000	5,219					
			5,000	0,000	475,521	58,135	1.699,543
0+400	0,000	6,408					
			5,000	0,000	475,521	68,140	1.767,683
0+410	0,000	7,220					
			4,866	0,000	475,521	65,399	1.833,082
0+419,732	0,000	6,220					
			0,134	0,000	475,521	1,661	1.834,743
0+420	0,000	6,179					
			10,000	0,000	475,521	106,540	1.941,283
0+440	0,000	4,475					
			10,000	0,070	475,591	70,270	2.011,553
0+460	0,007	2,552					
			10,000	0,070	475,661	30,870	2.042,423
0+480	0,000	0,535					
			10,000	4,460	480,121	6,630	2.049,053
0+500	0,446	0,128					
			10,000	22,820	502,941	1,280	2.050,333
0+520	1,836	0,000					
			10,000	38,940	541,881	0,000	2.050,333
0+540	2,058	0,000					
			10,000	31,920	573,801	5,160	2.055,493
0+560	1,134	0,516					
			1,943	4,019	577,820	2,595	2.058,088
0+563,885	0,935	0,820					
			3,058	4,822	582,642	6,711	2.064,799
0+570	0,642	1,375					
			5,000	4,710	587,352	20,095	2.084,894
0+580	0,300	2,644					
			5,000	1,565	588,917	25,850	2.110,744
0+590	0,013	2,526					

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
0+590	0,013	2,526					
			1,943	0,025	588,942	9,637	2.120,381
0+593,885	0,000	2,435					
			3,058	0,000	588,942	14,175	2.134,556
0+600	0,000	2,201					
			5,000	0,000	588,942	19,385	2.153,941
0+610	0,000	1,676					
			5,000	0,000	588,942	10,100	2.164,041
0+620	0,000	0,344					
			0,059	0,000	588,942	0,040	2.164,081
0+620,117	0,000	0,335					
			4,942	0,089	589,031	1,873	2.165,954
0+630	0,018	0,044					
			5,000	2,940	591,971	0,255	2.166,209
0+640	0,570	0,007					
			5,000	12,475	604,446	0,035	2.166,244
0+650	1,925	0,000					
			0,059	0,226	604,672	0,000	2.166,244
0+650,117	1,942	0,000					
			4,942	29,461	634,133	0,000	2.166,244
0+660	4,020	0,000					
			5,000	54,645	688,778	0,000	2.166,244
0+670	6,909	0,000					
			1,773	25,166	713,944	0,000	2.166,244
0+673,545	7,289	0,000					
			3,228	44,168	758,112	0,000	2.166,244
0+680	6,396	0,000					
			5,000	60,500	818,612	0,000	2.166,244
0+690	5,704	0,000					
			5,000	57,065	875,677	0,000	2.166,244
0+700	5,709	0,000					
			5,000	56,665	932,342	0,000	2.166,244
0+710	5,624	0,000					
			1,773	19,896	952,238	0,000	2.166,244
0+713,545	5,601	0,000					
			3,228	36,112	988,350	0,000	2.166,244
0+720	5,588	0,000					
			5,000	52,235	1.040,585	0,000	2.166,244
0+730	4,859	0,000					
			5,000	43,975	1.084,560	0,000	2.166,244
0+740	3,936	0,000					
			5,000	37,185	1.121,745	11,095	2.177,339
0+750	3,501	2,219					
			5,000	27,160	1.148,905	51,690	2.229,029
0+760	1,931	8,119					

ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
0+760	1,931	8,119					
			5,000	15,915	1.164,820	101,965	2.330,994
0+770	1,252	12,274					
			5,000	6,610	1.171,430	122,045	2.453,039
0+780	0,070	12,135					
			5,000	0,350	1.171,780	126,525	2.579,564
0+790	0,000	13,170					
			5,000	0,000	1.171,780	144,810	2.724,374
0+800	0,000	15,792					
			4,862	0,000	1.171,780	140,473	2.864,847
0+809,723	0,000	13,103					
			0,139	0,000	1.171,780	3,634	2.868,481
0+810	0,000	13,133					
			5,000	0,000	1.171,780	131,725	3.000,206
0+820	0,000	13,212					
			5,000	0,000	1.171,780	135,990	3.136,196
0+830	0,000	13,986					
			5,000	0,000	1.171,780	143,155	3.279,351
0+840	0,000	14,645					
			4,862	0,000	1.171,780	143,784	3.423,135
0+849,723	0,000	14,931					
			5,139	0,000	1.171,780	157,932	3.581,067
0+860	0,000	15,804					
			10,000	0,000	1.171,780	293,850	3.874,917
0+880	0,000	13,581					
			10,000	1,100	1.172,880	166,240	4.041,157
0+900	0,110	3,043					
			10,000	87,320	1.260,200	30,430	4.071,587
0+920	8,622	0,000					
			4,607	104,892	1.365,092	0,000	4.071,587
0+929,214	14,146	0,000					
			0,393	11,059	1.376,151	0,000	4.071,587
0+930	13,994	0,000					
			5,000	129,335	1.505,486	0,000	4.071,587
0+940	11,873	0,000					
			5,000	124,430	1.629,916	0,000	4.071,587
0+950	13,013	0,000					
			5,000	129,235	1.759,151	0,000	4.071,587
0+960	12,834	0,000					
			4,607	106,597	1.865,748	0,000	4.071,587
0+969,214	10,304	0,000					
			0,393	8,056	1.873,804	0,000	4.071,587
0+970	10,195	0,000					
			5,000	96,865	1.970,669	0,000	4.071,587
0+980	9,178	0,000					

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Projeto: Tigrinhos - SC

Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
0+980	9,178	0,000					
			5,000	85,860	2.056,529	0,000	4.071,587
0+990	7,994	0,000					
			5,000	72,270	2.128,799	0,000	4.071,587
1	6,460	0,000					
			5,000	57,685	2.186,484	0,000	4.071,587
1+10	5,077	0,000					
			5,000	44,480	2.230,964	0,000	4.071,587
1+20	3,819	0,000					
			5,000	33,195	2.264,159	0,000	4.071,587
1+30	2,820	0,000					
			2,519	13,121	2.277,280	0,000	4.071,587
1+35,038	2,389	0,000					
			2,481	10,440	2.287,720	0,000	4.071,587
1+40	1,819	0,000					
			5,000	14,040	2.301,760	13,220	4.084,807
1+50	0,989	2,644					
			5,000	4,945	2.306,705	25,035	4.109,842
1+60	0,000	2,363					
			5,000	0,000	2.306,705	48,655	4.158,497
1+70	0,000	7,368					
			5,000	0,000	2.306,705	136,410	4.294,907
1+80	0,000	19,914					
			0,663	0,000	2.306,705	26,724	4.321,631
1+81,326	0,000	20,393					
			4,337	0,000	2.306,705	192,433	4.514,064
1+90	0,000	23,977					
			5,000	0,000	2.306,705	193,670	4.707,734
1+100	0,000	14,757					
			5,000	0,000	2.306,705	84,935	4.792,669
1+110	0,000	2,230					
			5,000	2,090	2.308,795	11,390	4.804,059
1+120	0,418	0,048					
			0,663	0,674	2.309,469	0,035	4.804,094
1+121,326	0,599	0,005					
			3,354	8,687	2.318,156	0,017	4.804,111
1+128,034	1,991	0,000					
			0,983	4,397	2.322,553	0,000	4.804,111
1+130	2,482	0,000					
			5,000	23,590	2.346,143	0,000	4.804,111
1+140	2,236	0,000					
			5,000	11,180	2.357,323	1,830	4.805,941
1+150	0,000	0,366					
			4,017	0,000	2.357,323	4,708	4.810,649
1+158,034	0,000	0,806					

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Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
1+158,034	0,000	0,806					
			0,983	0,000	2.357,323	1,516	4.812,165
1+160	0,000	0,736					
			5,000	2,520	2.359,843	4,815	4.816,980
1+170	0,504	0,227					
			5,000	2,520	2.362,363	6,255	4.823,235
1+180	0,000	1,024					
			5,000	1,235	2.363,598	17,760	4.840,995
1+190	0,247	2,528					
			5,000	3,460	2.367,058	29,060	4.870,055
1+200	0,445	3,284					
			5,000	5,980	2.373,038	36,420	4.906,475
1+210	0,751	4,000					
			5,000	15,740	2.388,778	41,000	4.947,475
1+220	2,397	4,200					
			5,000	44,065	2.432,843	34,700	4.982,175
1+230	6,416	2,740					
			5,000	71,240	2.504,083	17,095	4.999,270
1+240	7,832	0,679					
			5,000	53,715	2.557,798	3,410	5.002,680
1+250	2,911	0,003					
			5,000	22,215	2.580,013	0,045	5.002,725
1+260	1,532	0,006					
			1,732	3,470	2.583,483	0,637	5.003,362
1+263,463	0,472	0,362					
			3,269	1,729	2.585,212	9,453	5.012,815
1+270	0,057	2,530					
			5,000	0,285	2.585,497	45,210	5.058,025
1+280	0,000	6,512					
			5,000	0,000	2.585,497	73,870	5.131,895
1+290	0,000	8,262					
			1,732	0,000	2.585,497	29,583	5.161,478
1+293,463	0,000	8,823					
			3,269	0,000	2.585,497	57,679	5.219,157
1+300	0,000	8,824					
			7,962	5,836	2.591,333	94,636	5.313,793
1+315,924	0,733	3,062					
			2,038	3,840	2.595,173	8,939	5.322,732
1+320	1,151	1,324					
			2,500	8,498	2.603,671	3,598	5.326,330
1+325	2,248	0,115					
			2,500	16,510	2.620,181	0,288	5.326,618
1+330	4,356	0,000					
			2,500	26,605	2.646,786	0,000	5.326,618
1+335	6,286	0,000					

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
1+335	6,286	0,000					
			2,500	32,015	2.678,801	0,000	5.326,618
1+340	6,520	0,000					
			2,500	33,858	2.712,659	0,000	5.326,618
1+345	7,023	0,000					
			0,462	6,558	2.719,217	0,000	5.326,618
1+345,924	7,172	0,000					
			2,038	30,855	2.750,072	0,000	5.326,618
1+350	7,968	0,000					
			2,500	37,177	2.787,249	0,000	5.326,618
1+355	6,903	0,000					
			2,500	31,485	2.818,734	0,000	5.326,618
1+360	5,691	0,000					
			2,500	25,955	2.844,689	0,000	5.326,618
1+365	4,691	0,000					
			2,500	21,345	2.866,034	0,000	5.326,618
1+370	3,847	0,000					
			2,500	15,348	2.881,382	0,090	5.326,708
1+375	2,292	0,036					
			2,500	8,235	2.889,617	2,098	5.328,806
1+380	1,002	0,803					
			2,500	3,423	2.893,040	7,110	5.335,916
1+385	0,367	2,041					
			2,500	1,142	2.894,182	13,165	5.349,081
1+390	0,090	3,225					
			2,500	0,320	2.894,502	18,508	5.367,589
1+395	0,038	4,178					
			2,500	0,107	2.894,609	22,235	5.389,824
1+400	0,005	4,716					
			1,736	0,009	2.894,618	16,542	5.406,366
1+403,472	0,000	4,813					
			0,764	0,000	2.894,618	7,359	5.413,725
1+405	0,000	4,819					
			2,500	0,000	2.894,618	23,998	5.437,723
1+410	0,000	4,780					
			2,500	0,000	2.894,618	19,168	5.456,891
1+415	0,000	2,887					
			2,500	0,080	2.894,698	9,473	5.466,364
1+420	0,032	0,902					
			2,500	2,930	2.897,628	2,375	5.468,739
1+425	1,140	0,048					
			2,500	10,795	2.908,423	0,120	5.468,859
1+430	3,178	0,000					
			1,736	10,393	2.918,816	0,000	5.468,859
1+433,472	2,809	0,000					

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Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
1+433,472	2,809	0,000					
			3,264	15,455	2.934,271	0,000	5.468,859
1+440	1,926	0,000					
			10,000	35,660	2.969,931	0,000	5.468,859
1+460	1,640	0,000					
			2,074	8,080	2.978,011	0,000	5.468,859
1+464,147	2,257	0,000					
			2,927	15,639	2.993,650	0,000	5.468,859
1+470	3,087	0,000					
			5,000	48,145	3.041,795	0,000	5.468,859
1+480	6,542	0,000					
			5,000	79,490	3.121,285	0,000	5.468,859
1+490	9,356	0,000					
			2,074	35,627	3.156,912	0,000	5.468,859
1+494,147	7,826	0,000					
			2,927	38,832	3.195,744	0,000	5.468,859
1+500	5,443	0,000					
			5,000	32,660	3.228,404	0,000	5.468,859
1+510	1,089	0,000					
			5,000	5,445	3.233,849	0,775	5.469,634
1+520	0,000	0,155					
			5,000	0,275	3.234,124	12,065	5.481,699
1+530	0,055	2,258					
			5,000	0,275	3.234,399	17,160	5.498,859
1+540	0,000	1,174					
			5,000	0,000	3.234,399	9,500	5.508,359
1+550	0,000	0,726					
			1,285	0,000	3.234,399	1,557	5.509,916
1+552,570	0,000	0,486					
			3,715	0,000	3.234,399	2,931	5.512,847
1+560	0,000	0,303					
			5,000	0,000	3.234,399	4,965	5.517,812
1+570	0,000	0,690					
			5,000	0,000	3.234,399	12,775	5.530,587
1+580	0,000	1,865					
			3,285	0,141	3.234,540	16,333	5.546,920
1+586,570	0,043	3,107					
			1,715	0,098	3.234,638	9,909	5.556,829
1+590	0,014	2,671					
			2,500	0,035	3.234,673	12,182	5.569,011
1+595	0,000	2,202					
			2,500	0,000	3.234,673	11,233	5.580,244
1+600	0,000	2,291					
			2,500	0,000	3.234,673	12,840	5.593,084
1+605	0,000	2,845					



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Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
1+605	0,000	2,845					
			2,500	0,000	3.234,673	12,698	5.605,782
1+610	0,000	2,234					
			2,500	0,000	3.234,673	12,813	5.618,595
1+615	0,000	2,891					
			2,500	0,000	3.234,673	18,393	5.636,988
1+620	0,000	4,466					
			0,125	0,000	3.234,673	1,129	5.638,117
1+620,250	0,000	4,568					
			2,375	0,000	3.234,673	26,704	5.664,821
1+625	0,000	6,676					
			2,500	3,073	3.237,746	25,355	5.690,176
1+630	1,229	3,466					
			2,500	24,007	3.261,753	8,758	5.698,934
1+635	8,374	0,037					
			0,805	16,034	3.277,787	0,030	5.698,964
1+636,610	11,544	0,000					
			1,695	50,762	3.328,549	0,000	5.698,964
1+640	18,404	0,000					
			2,500	120,580	3.449,129	0,000	5.698,964
1+645	29,828	0,000					
			2,500	170,353	3.619,482	0,000	5.698,964
1+650	38,313	0,000					
			2,500	194,440	3.813,922	0,000	5.698,964
1+655	39,463	0,000					
			2,500	198,943	4.012,865	0,000	5.698,964
1+660	40,114	0,000					
			2,500	203,203	4.216,068	0,000	5.698,964
1+665	41,167	0,000					
			0,810	65,428	4.281,496	0,000	5.698,964
1+666,620	39,608	0,000					
			1,690	125,523	4.407,019	0,000	5.698,964
1+670	34,666	0,000					
			2,500	154,483	4.561,502	0,000	5.698,964
1+675	27,127	0,000					
			2,500	125,865	4.687,367	0,000	5.698,964
1+680	23,219	0,000					
			2,500	113,483	4.800,850	0,000	5.698,964
1+685	22,174	0,000					
			2,500	109,958	4.910,808	0,000	5.698,964
1+690	21,809	0,000					
			2,500	113,227	5.024,035	0,000	5.698,964
1+695	23,482	0,000					
			0,810	37,539	5.061,574	0,000	5.698,964
1+696,620	22,863	0,000					

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Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
1+696,620	22,863	0,000					
			1,690	75,797	5.137,371	0,000	5.698,964
1+700	21,987	0,000					
			2,500	106,640	5.244,011	0,000	5.698,964
1+705	20,669	0,000					
			2,500	101,035	5.345,046	0,000	5.698,964
1+710	19,745	0,000					
			2,500	98,680	5.443,726	0,000	5.698,964
1+715	19,727	0,000					
			2,500	96,813	5.540,539	0,000	5.698,964
1+720	18,998	0,000					
			2,500	91,940	5.632,479	0,000	5.698,964
1+725	17,778	0,000					
			2,500	85,925	5.718,404	0,000	5.698,964
1+730	16,592	0,000					
			2,091	67,650	5.786,054	0,000	5.698,964
1+734,182	15,761	0,000					
			0,409	12,824	5.798,878	0,000	5.698,964
1+735	15,593	0,000					
			2,500	74,787	5.873,665	0,000	5.698,964
1+740	14,322	0,000					
			2,500	68,665	5.942,330	0,000	5.698,964
1+745	13,144	0,000					
			2,500	63,690	6.006,020	0,000	5.698,964
1+750	12,332	0,000					
			2,500	60,123	6.066,143	0,000	5.698,964
1+755	11,717	0,000					
			2,500	55,180	6.121,323	0,000	5.698,964
1+760	10,355	0,000					
			2,091	39,946	6.161,269	0,000	5.698,964
1+764,182	8,749	0,000					
			7,909	86,627	6.247,896	0,870	5.699,834
1+780	2,204	0,110					
			10,000	23,130	6.271,026	99,550	5.799,384
1+800	0,109	9,845					
			10,000	1,090	6.272,116	276,130	6.075,514
1+820	0,000	17,768					
			10,000	3,650	6.275,766	251,300	6.326,814
1+840	0,365	7,362					
			10,000	5,210	6.280,976	97,620	6.424,434
1+860	0,156	2,400					
			10,000	7,130	6.288,106	96,950	6.521,384
1+880	0,557	7,295					
			10,000	9,890	6.297,996	240,340	6.761,724
1+900	0,432	16,739					

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Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
1+900	0,432	16,739					
			0,592	0,513	6.298,509	20,374	6.782,098
1+901,184	0,435	17,677					
			4,408	3,178	6.301,687	133,805	6.915,903
1+910	0,286	12,678					
			5,000	1,590	6.303,277	101,505	7.017,408
1+920	0,032	7,623					
			5,000	0,875	6.304,152	57,570	7.074,978
1+930	0,143	3,891					
			0,592	0,202	6.304,354	4,401	7.079,379
1+931,184	0,199	3,543					
			4,408	3,134	6.307,488	22,551	7.101,930
1+940	0,512	1,573					
			5,000	16,515	6.324,003	7,890	7.109,820
1+950	2,791	0,005					
			5,000	46,540	6.370,543	0,025	7.109,845
1+960	6,517	0,000					
			5,000	92,795	6.463,338	0,000	7.109,845
1+970	12,042	0,000					
			0,546	13,424	6.476,762	0,000	7.109,845
1+971,091	12,567	0,000					
			4,455	127,786	6.604,548	0,000	7.109,845
1+980	16,120	0,000					
			5,000	158,355	6.762,903	0,000	7.109,845
1+990	15,551	0,000					
			5,000	160,415	6.923,318	0,000	7.109,845
2	16,532	0,000					
			0,546	18,166	6.941,484	0,000	7.109,845
2+1,091	16,769	0,000					
			9,455	289,705	7.231,189	0,000	7.109,845
2+20	13,873	0,000					
			10,000	282,780	7.513,969	0,000	7.109,845
2+40	14,405	0,000					
			10,000	312,870	7.826,839	0,000	7.109,845
2+60	16,882	0,000					
			3,163	110,931	7.937,770	0,000	7.109,845
2+66,325	18,195	0,000					
			1,838	68,715	8.006,485	0,000	7.109,845
2+70	19,201	0,000					
			5,000	205,615	8.212,100	0,000	7.109,845
2+80	21,922	0,000					
			5,000	207,710	8.419,810	0,000	7.109,845
2+90	19,620	0,000					
			3,163	123,053	8.542,863	0,000	7.109,845
2+96,325	19,290	0,000					

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Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
2+96,325	19,290	0,000					
			1,838	71,519	8.614,382	0,000	7.109,845
2+100	19,632	0,000					
			5,000	148,515	8.762,897	0,000	7.109,845
2+110	10,071	0,000					
			5,000	56,160	8.819,057	5,195	7.115,040
2+120	1,161	1,039					
			3,084	3,747	8.822,804	16,142	7.131,182
2+126,168	0,054	4,195					
			1,916	0,103	8.822,907	19,545	7.150,727
2+130	0,000	6,006					
			5,000	0,000	8.822,907	85,325	7.236,052
2+140	0,000	11,059					
			5,000	0,000	8.822,907	123,445	7.359,497
2+150	0,000	13,630					
			5,000	0,000	8.822,907	154,860	7.514,357
2+160	0,000	17,342					
			5,000	0,000	8.822,907	116,135	7.630,492
2+170	0,000	5,885					
			5,000	0,000	8.822,907	34,660	7.665,152
2+180	0,000	1,047					
			4,793	0,000	8.822,907	9,979	7.675,131
2+189,586	0,000	1,035					
			0,207	0,000	8.822,907	0,427	7.675,558
2+190	0,000	1,030					
			5,000	0,000	8.822,907	9,825	7.685,383
2+200	0,000	0,935					
			5,000	0,000	8.822,907	7,790	7.693,173
2+210	0,000	0,623					
			4,793	0,000	8.822,907	5,109	7.698,282
2+219,586	0,000	0,443					
			0,207	0,000	8.822,907	0,183	7.698,465
2+220	0,000	0,439					
			10,000	0,000	8.822,907	26,300	7.724,765
2+240	0,000	2,191					
			10,000	43,980	8.866,887	21,910	7.746,675
2+260	4,398	0,000					
			3,756	44,137	8.911,024	0,000	7.746,675
2+267,512	7,353	0,000					
			1,244	18,792	8.929,816	0,000	7.746,675
2+270	7,753	0,000					
			5,000	92,730	9.022,546	0,000	7.746,675
2+280	10,793	0,000					
			5,000	130,460	9.153,006	0,000	7.746,675
2+290	15,299	0,000					

ENGMETRIA - Ltda.

Projeto: Tigrinhos - SC

Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
2+290	15,299	0,000					
			3,756	120,038	9.273,044	0,000	7.746,675
2+297,512	16,660	0,000					
			1,244	42,418	9.315,462	0,000	7.746,675
2+300	17,438	0,000					
			5,000	176,500	9.491,962	0,000	7.746,675
2+310	17,862	0,000					
			5,000	137,710	9.629,672	0,000	7.746,675
2+320	9,680	0,000					
			5,000	77,640	9.707,312	0,000	7.746,675
2+330	5,848	0,000					
			1,571	17,581	9.724,893	0,000	7.746,675
2+333,142	5,343	0,000					
			3,429	34,160	9.759,053	0,000	7.746,675
2+340	4,619	0,000					
			5,000	39,450	9.798,503	0,000	7.746,675
2+350	3,271	0,000					
			5,000	24,805	9.823,308	0,885	7.747,560
2+360	1,690	0,177					
			3,076	8,637	9.831,945	1,535	7.749,095
2+366,152	1,118	0,322					
			1,924	3,994	9.835,939	1,129	7.750,224
2+370	0,958	0,265					
			5,000	12,695	9.848,634	1,330	7.751,554
2+380	1,581	0,001					
			5,000	20,375	9.869,009	0,845	7.752,399
2+390	2,494	0,168					
			4,076	31,858	9.900,867	0,685	7.753,084
2+398,152	5,322	0,000					
			0,924	10,457	9.911,324	0,000	7.753,084
2+400	5,995	0,000					
			5,000	77,750	9.989,074	0,000	7.753,084
2+410	9,555	0,000					
			5,000	103,770	10.092,844	0,000	7.753,084
2+420	11,199	0,000					
			5,000	114,110	10.206,954	0,000	7.753,084
2+430	11,623	0,000					
			0,076	1,767	10.208,721	0,000	7.753,084
2+430,152	11,624	0,000					
			4,924	116,019	10.324,740	0,000	7.753,084
2+440	11,938	0,000					
			10,000	237,210	10.561,950	0,000	7.753,084
2+460	11,783	0,000					
			6,395	123,037	10.684,987	0,000	7.753,084
2+472,789	7,458	0,000					

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Projeto: Tigrinhos - SC

Volume

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

Km	Área Corte	Área Aterro	Semi-Dis.	Vol.Corte	V.C.Acum.	Vol.Aterro	V.A.Acum.
2+472,789	7,458	0,000					
			3,606	42,786	10.727,773	0,000	7.753,084
2+480	4,409	0,000					
			10,000	82,230	10.810,003	0,000	7.753,084
2+500	3,814	0,000					
			10,000	56,480	10.866,483	0,000	7.753,084
2+520	1,834	0,000					
			10,000	18,340	10.884,823	16,230	7.769,314
2+540	0,000	1,623					
			10,000	0,040	10.884,863	40,070	7.809,384
2+560	0,004	2,384					
			10,000	0,040	10.884,903	26,480	7.835,864
2+580	0,000	0,264					
			10,000	6,600	10.891,503	2,980	7.838,844
2+600	0,660	0,034					
			8,085	5,829	10.897,332	3,468	7.842,312
2+616,170	0,061	0,395					
			1,915	0,117	10.897,449	2,332	7.844,644
2+620	0,000	0,823					
			10,000	0,090	10.897,539	40,290	7.884,934
2+640	0,009	3,206					
			10,000	0,090	10.897,629	75,410	7.960,344
2+660	0,000	4,335					
			10,000	0,000	10.897,629	79,410	8.039,754
2+680	0,000	3,606					
			10,000	4,930	10.902,559	36,150	8.075,904
2+700	0,493	0,009					
			10,000	22,190	10.924,749	0,390	8.076,294
2+720	1,726	0,030					
			10,000	44,580	10.969,329	0,300	8.076,594
2+740	2,732	0,000					
			10,000	46,380	11.015,709	0,000	8.076,594
2+760	1,906	0,000					
			10,000	29,400	11.045,109	0,100	8.076,694
2+780	1,034	0,010					
			10,000	10,980	11.056,089	2,920	8.079,614
2+800	0,064	0,282					
			10,000	0,640	11.056,729	6,350	8.085,964
2+820	0,000	0,353					
			10,000	0,000	11.056,729	9,120	8.095,084
2+840	0,000	0,559					
			7,500	0,000	11.056,729	16,155	8.111,239
2+855	0,000	1,595					

**ENGMETRIA - Ltda.****Projeto: Tigrinhos - SC****Volume**

## Cálculo de Volume por Comparação de Perfis: Terreno x Projeto

	Corte	Aterro
Áreas	1.624,6170 m <sup>2</sup>	834,805 m <sup>2</sup>
Volumes	11.056,729 m <sup>3</sup>	8.111,239 m <sup>3</sup>