

**Estado do Ceará
Prefeitura Municipal de
São Gonçalo do Amarante**



Projeto Básico de Engenharia

**Construção da Rodovia Municipal de Ligação do
Distrito de Croatá a comunidade Violeta**

Volume 3C – Notas de Serviço e Cálculos de Volume

Agosto / 2017

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APRESENTAÇÃO

APRESENTAÇÃO

A empresa **TECHPROJ Consultoria e Projetos** apresenta o **Volume 3C – Notas de Serviço e Cálculos de Volume**, referente ao Projeto Básico de Engenharia para a Rodovia de Ligação Croatá - Violete localizado no município de São Gonçalo do Amarante.

O trecho de pavimentação em CBUQ apresentado foi desenvolvido com velocidade diretriz de 60km/h, com uma pista de 6m de largura e calçadas de 2m para ambos os lados.

O Projeto Final, em sua forma de apresentação consta de 05 (cinco) volumes, assim identificados:

VOLUME 1 – RELATÓRIO DO PROJETO

Objetivo

Apresentar em formato A4 todas as informações necessárias à licitação da obra, em conformidade com as Instruções Provisórias para Apresentação de Relatórios e Projetos Básicos de Engenharia para Restauração de Rodovias.

VOLUME 2 – PROJETO DE EXECUÇÃO

Objetivo

Apresentar as plantas, perfis, seções transversais tipo, desenhos, tabelas e demais elementos gráficos necessários à execução dos projetos. É apresentado em formato A3.

VOLUME 3A – ESTUDOS GEOTÉCNICOS.

Objetivo

Apresentar os elementos obtidos nos estudos geotécnicos, tais como boletins de sondagens e os resultados dos ensaios efetuados para as camadas do pavimento existente, subleito da duplicação e terceira faixa, ocorrências de solo, areais, pedreiras e empréstimos para terraplenagem. É apresentado em formato A4.

VOLUME 3C – NOTAS DE SERVIÇO E CÁLCULO DE VOLUMES

Objetivo

Apresentar todos os estudos e projetos desenvolvidos, as metodologias adotadas, os resultados obtidos e a conclusão a respeito dos trabalhos. É apresentado em formato A4.

VOLUME 4 – ORÇAMENTO

Objetivo

Apresentar o custo de todas as obras necessárias à execução do Projeto e como deverá ser executado o mesmo, indicando e justificando os métodos adotados na sua obtenção. É apresentado em formato A4.

O presente volume corresponde ao **VOLUME 3C – NOTAS DE SERVIÇO E CÁLCULO DE VOLUMES.**

1. MAPA DE SITUAÇÃO

MAPA DE SITUAÇÃO



2. QUADRO DE COORDENADAS

QUADRO DE COORDENADAS			
Alinhamento: Rua Valdo Uchôa			
Estaca	Norte	Leste	Rumo
0+0.00	9,593,906.7277m	488,146.4738m	N87° 26' 54"E
1+0.00	9,593,907.6181m	488,166.4540m	N87° 26' 54"E
2+0.00	9,593,908.5086m	488,186.4341m	N87° 26' 54"E
3+0.00	9,593,909.3990m	488,206.4143m	N87° 26' 54"E
4+0.00	9,593,910.2895m	488,226.3945m	N87° 26' 54"E
5+0.00	9,593,911.1799m	488,246.3746m	N87° 26' 54"E
6+0.00	9,593,911.6617m	488,266.3684m	N88° 44' 03"E
7+0.00	9,593,912.1036m	488,286.3636m	N88° 44' 03"E
8+0.00	9,593,912.5454m	488,306.3587m	N88° 44' 03"E
9+0.00	9,593,912.9872m	488,326.3538m	N88° 44' 03"E
10+0.00	9,593,913.5783m	488,346.3450m	N88° 17' 07"E
11+0.00	9,593,914.1768m	488,366.3361m	N88° 17' 07"E
12+0.00	9,593,914.7753m	488,386.3271m	N88° 17' 07"E
13+0.00	9,593,915.0562m	488,406.3250m	N89° 14' 59"E
14+0.00	9,593,915.3182m	488,426.3233m	N89° 14' 59"E
15+0.00	9,593,915.6970m	488,446.3196m	N88° 51' 40"E
16+0.00	9,593,916.0945m	488,466.3157m	N88° 51' 40"E
17+0.00	9,593,916.4921m	488,486.3117m	N88° 51' 40"E
18+0.00	9,593,916.9263m	488,506.3067m	N87° 53' 03"E
19+0.00	9,593,917.6647m	488,526.2931m	N87° 53' 03"E
20+0.00	9,593,918.4032m	488,546.2795m	N87° 53' 03"E
21+0.00	9,593,919.1416m	488,566.2658m	N87° 53' 03"E
22+0.00	9,593,919.8800m	488,586.2522m	N87° 53' 03"E
23+0.00	9,593,920.6184m	488,606.2386m	N87° 53' 03"E
24+0.00	9,593,921.3569m	488,626.2249m	N87° 53' 03"E
25+0.00	9,593,922.0953m	488,646.2113m	N87° 53' 03"E
26+0.00	9,593,922.8337m	488,666.1976m	N87° 53' 03"E
27+0.00	9,593,923.9452m	488,686.1659m	N86° 33' 56"E

QUADRO DE COORDENADAS			
Alinhamento: Rua Valdo Uchôa			
Estaca	Norte	Leste	Rumo
28+0.00	9,593,925.1433m	488,706.1300m	N86° 33' 56"E
29+0.00	9,593,926.3415m	488,726.0941m	N86° 33' 56"E
30+0.00	9,593,927.5396m	488,746.0582m	N86° 33' 56"E
31+0.00	9,593,928.7378m	488,766.0222m	N86° 33' 56"E
32+0.00	9,593,929.9359m	488,785.9863m	N86° 33' 56"E
33+0.00	9,593,930.6494m	488,805.9697m	N88° 52' 52"E
34+0.00	9,593,931.0399m	488,825.9659m	N88° 52' 52"E
35+0.00	9,593,931.4305m	488,845.9620m	N88° 52' 52"E
36+0.00	9,593,931.8210m	488,865.9582m	N88° 52' 52"E
37+0.00	9,593,931.6800m	488,885.9537m	S88° 43' 16"E
38+0.00	9,593,931.2336m	488,905.9487m	S88° 43' 16"E
39+0.00	9,593,930.7872m	488,925.9437m	S88° 43' 16"E
40+0.00	9,593,930.9192m	488,945.9139m	N83° 48' 24"E
41+0.00	9,593,933.0768m	488,965.7972m	N83° 48' 24"E
42+0.00	9,593,934.9272m	488,985.7092m	N85° 29' 40"E
43+0.00	9,593,936.4983m	489,005.6474m	N85° 29' 40"E
44+0.00	9,593,938.0695m	489,025.5856m	N85° 29' 40"E
45+0.00	9,593,939.4188m	489,045.5365m	N87° 58' 30"E
46+0.00	9,593,940.1255m	489,065.5240m	N87° 58' 30"E
47+0.00	9,593,940.8322m	489,085.5115m	N87° 58' 30"E
48+0.00	9,593,941.4903m	489,105.5006m	N88° 13' 08"E
49+0.00	9,593,942.1119m	489,125.4909m	N88° 13' 08"E
50+0.00	9,593,942.7336m	489,145.4813m	N88° 13' 08"E
51+0.00	9,593,943.3553m	489,165.4716m	N88° 13' 08"E
52+0.00	9,593,943.9769m	489,185.4620m	N88° 13' 08"E
53+0.00	9,593,944.5986m	489,205.4523m	N88° 13' 08"E
54+0.00	9,593,945.1437m	489,225.4448m	N88° 29' 51"E
55+0.00	9,593,945.6681m	489,245.4379m	N88° 29' 51"E

QUADRO DE COORDENADAS			
Alinhamento: Rua Valdo Uchôa			
Estaca	Norte	Leste	Rumo
56+0.00	9,593,946.1926m	489,265.4311m	N88° 29' 51"E
57+0.00	9,593,946.7170m	489,285.4242m	N88° 29' 51"E
58+0.00	9,593,947.2414m	489,305.4173m	N88° 29' 51"E
59+0.00	9,593,947.8375m	489,325.4079m	N87° 31' 17"E
60+0.00	9,593,948.7025m	489,345.3892m	N87° 31' 17"E
61+0.00	9,593,949.5674m	489,365.3705m	N87° 31' 17"E
62+0.00	9,593,950.4324m	489,385.3518m	N87° 31' 17"E
63+0.00	9,593,951.2974m	489,405.3331m	N87° 31' 17"E
64+0.00	9,593,952.1624m	489,425.3144m	N87° 31' 17"E
65+0.00	9,593,953.0123m	489,445.2960m	N89° 52' 02"E
66+0.00	9,593,953.0587m	489,465.2960m	N89° 52' 02"E
67+0.00	9,593,953.1050m	489,485.2959m	N89° 52' 02"E
68+0.00	9,593,953.1514m	489,505.2958m	N89° 52' 02"E
69+0.00	9,593,953.1977m	489,525.2958m	N89° 52' 02"E
70+0.00	9,593,953.2440m	489,545.2957m	N89° 52' 02"E
71+0.00	9,593,953.4250m	489,565.2932m	N88° 00' 03"E
72+0.00	9,593,954.1227m	489,585.2810m	N88° 00' 03"E
73+0.00	9,593,954.8204m	489,605.2688m	N88° 00' 03"E
74+0.00	9,593,956.0792m	489,625.2219m	N84° 54' 39"E
75+0.00	9,593,957.8533m	489,645.1431m	N84° 54' 39"E
76+0.00	9,593,959.6274m	489,665.0642m	N84° 54' 39"E
77+0.00	9,593,961.4016m	489,684.9854m	N84° 54' 39"E
78+0.00	9,593,963.1757m	489,704.9065m	N84° 54' 39"E
79+0.00	9,593,964.9498m	489,724.8277m	N84° 54' 39"E
80+0.00	9,593,966.4950m	489,744.7678m	N85° 35' 52"E
81+0.00	9,593,968.0302m	489,764.7088m	N85° 35' 52"E
82+0.00	9,593,969.5653m	489,784.6498m	N85° 35' 52"E
83+0.00	9,593,970.2661m	489,804.6279m	N89° 18' 46"E

QUADRO DE COORDENADAS			
Alinhamento: Rua Valdo Uchôa			
Estaca	Norte	Leste	Rumo
84+0.00	9,593,970.5060m	489,824.6265m	N89° 18' 46"E
85+0.00	9,593,970.7459m	489,844.6250m	N89° 18' 46"E
86+0.00	9,593,970.9858m	489,864.6236m	N89° 18' 46"E
87+0.00	9,593,971.2531m	489,884.6218m	N89° 09' 06"E
88+0.00	9,593,971.5492m	489,904.6196m	N89° 09' 06"E
89+0.00	9,593,971.8452m	489,924.6174m	N89° 09' 06"E
90+0.00	9,593,972.1413m	489,944.6152m	N89° 09' 06"E
91+0.00	9,593,972.4771m	489,964.6124m	N88° 58' 44"E
92+0.00	9,593,972.8336m	489,984.6092m	N88° 58' 44"E
93+0.00	9,593,973.1900m	490,004.6060m	N88° 58' 44"E
94+0.00	9,593,974.2281m	490,024.5731m	N86° 01' 35"E
95+0.00	9,593,975.3943m	490,044.5380m	N87° 13' 18"E
96+0.00	9,593,976.3638m	490,064.5145m	N87° 13' 18"E
97+0.00	9,593,977.3333m	490,084.4910m	N87° 13' 18"E
98+0.00	9,593,978.3027m	490,104.4675m	N87° 13' 18"E
99+0.00	9,593,978.9054m	490,124.4578m	N88° 27' 22"E
100+0.00	9,593,979.4442m	490,144.4505m	N88° 27' 22"E
101+0.00	9,593,979.9830m	490,164.4433m	N88° 27' 22"E
102+0.00	9,593,980.5218m	490,184.4360m	N88° 27' 22"E
103+0.00	9,593,981.0606m	490,204.4288m	N88° 27' 22"E
104+0.00	9,593,981.5994m	490,224.4215m	N88° 27' 22"E
105+0.00	9,593,982.1382m	490,244.4143m	N88° 27' 22"E
106+0.00	9,593,982.4244m	490,264.4115m	N89° 29' 57"E
107+0.00	9,593,982.5992m	490,284.4107m	N89° 29' 57"E
108+0.00	9,593,982.7740m	490,304.4100m	N89° 29' 57"E
109+0.00	9,593,982.9488m	490,324.4092m	N89° 29' 57"E
110+0.00	9,593,983.6009m	490,344.3918m	N86° 29' 45"E
111+0.00	9,593,984.8234m	490,364.3544m	N86° 29' 45"E

3. NOTAS DE SERVIÇO

NOTA DE SERVIÇO											
Alinhamento: Rua Valdo Uchôa											
Lado Esquerdo				Eixo				Lado Direito			
OFFSET		BORDO		Estaca	Cota Projeto	Cota Terreno	Cota Vermelha	BORDO		OFFSET	
Afast. (m)	Cota (m)	Afast. (m)	Cota (m)					Afast. (m)	Cota (m)	Afast. (m)	Cota (m)
		-5000	52128	0+0.000	52216	52216	0.000	5000	52128	5089	52261
-5036	51310	-5000	51334	1+0.000	51422	51359	0.063	5000	51334	5067	51433
-5155	50771	-5000	50539	2+0.000	50627	50630	-0.003	5000	50539	5246	50907
-5293	50190	-5000	49752	3+0.000	49840	50332	-0.491	5000	49752		
		-5000	49046	4+0.000	49134	49611	-0.477	5000	49046		
		-5000	48439	5+0.000	48527	48603	-0.076	5000	48439	5248	48809
-5046	47895	-5000	47925	6+0.000	48013	47766	0.248	5000	47925	5168	47813
-5267	47252	-5000	47430	7+0.000	47518	47156	0.362	5000	47430	5401	47163
-5044	46906	-5000	46935	8+0.000	47023	46827	0.196	5000	46935	5075	46885
-5247	46276	-5000	46440	9+0.000	46528	46245	0.283	5000	46440	5180	46320
-5262	45920	-5000	46094	10+0.000	46182	45848	0.334	5000	46094	5350	45861
-5246	45882	-5000	46047	11+0.000	46135	45789	0.346	5000	46047	5566	45670
-5086	46239	-5000	46297	12+0.000	46385	46134	0.251	5000	46297	5640	45870
		-5000	46534	13+0.000	46622	46468	0.155	5000	46534	5559	46162
-5010	46230	-5000	46237	14+0.000	46325	46107	0.218	5000	46237	5470	45923
-5120	45699	-5000	45779	15+0.000	45867	45604	0.263	5000	45779	5421	45498
		-5000	45321	16+0.000	45409	45184	0.225	5000	45321	5218	45175
-5142	44768	-5000	44863	17+0.000	44951	44632	0.319	5000	44863	5234	44707
-5124	44322	-5000	44405	18+0.000	44493	44189	0.303	5000	44405	5174	44289
-5011	43963	-5000	43947	19+0.000	44035	43884	0.151	5000	43947	5044	43918
-5014	43510	-5000	43489	20+0.000	43577	43619	-0.042	5000	43489	5039	43547
-5152	43257	-5000	43031	21+0.000	43119	43075	0.044	5000	43031	5059	43119
-5074	42683	-5000	42573	22+0.000	42661	42474	0.186	5000	42573	5160	42466
-5054	42086	-5000	42122	23+0.000	42210	41924	0.285	5000	42122	5381	41868
-5489	41505	-5000	41831	24+0.000	41919	41489	0.431	5000	41831	5648	41399
-5759	41258	-5000	41764	25+0.000	41852	41198	0.654	5000	41764	5803	41229
-6125	41107	-5000	41857	26+0.000	41945	40949	0.995	5000	41857	6007	41185
-6533	40922	-5000	41944	27+0.000	42032	40899	1.133	5000	41944	6328	41059
-6548	40887	-5000	41919	28+0.000	42007	40845	1.161	5000	41919	6497	40921
-6446	40855	-5000	41819	29+0.000	41907	40747	1.160	5000	41819	6423	40870
		-5000	41743	30+0.000	41831	40677	1.154	5000	41743	6368	40832
		-5000	41818	31+0.000	41906	40737	1.169	5000	41818	6175	41034
		-5000	41919	32+0.000	42007	41141	0.866	5000	41919	6019	41240
		-5000	42110	33+0.000	42198	41688	0.510	5000	42110	5530	41756
		-5000	42445	34+0.000	42533	42304	0.229	5000	42445	5037	42499
-5020	42952	-5000	42923	35+0.000	43011	42842	0.169	5000	42923	5085	43050

NOTA DE SERVIÇO											
Alinhamento: Rua Valdo Uchôa											
Lado Esquerdo				Eixo				Lado Direito			
OFFSET		BORDO		Estaca	Cota Projeto	Cota Terreno	Cota Vermelha	BORDO		OFFSET	
Afast. (m)	Cota (m)	Afast. (m)	Cota (m)					Afast. (m)	Cota (m)	Afast. (m)	Cota (m)
-5372	43208	-5000	43456	36+0.000	43544	43324	0.220	5000	43456	5022	43442
-5661	43527	-5000	43967	37+0.000	44055	43801	0.255	5000	43967	5144	43872
-5055	44365	-5000	44402	38+0.000	44490	44254	0.236	5000	44402	5176	44285
-5288	44565	-5000	44758	39+0.000	44846	44624	0.221	5000	44758	5226	44607
-5519	44691	-5000	45036	40+0.000	45124	44810	0.314	5000	45036	5218	44891
-5662	44852	-5000	45293	41+0.000	45381	45033	0.348	5000	45293	5250	45127
-5438	45258	-5000	45550	42+0.000	45638	45398	0.240	5000	45550	5358	45311
-5398	45541	-5000	45806	43+0.000	45894	45615	0.279	5000	45806	5733	45318
-5274	45881	-5000	46063	44+0.000	46151	45774	0.378	5000	46063	5775	45546
-5194	46190	-5000	46320	45+0.000	46408	46006	0.401	5000	46320	5603	45918
-5618	46164	-5000	46577	46+0.000	46665	46336	0.329	5000	46577	5259	46404
-5091	46773	-5000	46833	47+0.000	46921	46774	0.147	5000	46833	5091	46969
-5048	47162	-5000	47090	48+0.000	47178	47139	0.039	5000	47090	5133	47289
-5018	47374	-5000	47347	49+0.000	47435	47438	-0.003	5000	47347	5121	47527
-5020	47590	-5000	47603	50+0.000	47691	47578	0.113	5000	47603	5074	47714
-5598	47460	-5000	47859	51+0.000	47947	47767	0.180	5000	47859	5268	47680
-5463	47764	-5000	48072	52+0.000	48160	47799	0.362	5000	48072	5639	47646
-5330	48015	-5000	48236	53+0.000	48324	47811	0.513	5000	48236	5601	47835
-5303	48194	-5000	48396	54+0.000	48484	47914	0.570	5000	48396	5491	48069
-5328	48337	-5000	48556	55+0.000	48644	48159	0.485	5000	48556	5379	48303
-5353	48481	-5000	48716	56+0.000	48804	48338	0.466	5000	48716	5282	48528
-5598	48477	-5000	48876	57+0.000	48964	48581	0.383	5000	48876	5201	48742
		-5000	49036	58+0.000	49124	48719	0.405	5000	49036	5720	48556
		-5000	49196	59+0.000	49284	48863	0.421	5000	49196	5691	48735
		-5000	49356	60+0.000	49444	49063	0.381	5000	49356	5663	48914
		-5000	49516	61+0.000	49604	49300	0.304	5000	49516	5645	49086
		-5000	49676	62+0.000	49764	49640	0.124	5000	49676	5048	49644
		-5000	49836	63+0.000	49924	49906	0.019	5000	49836	5085	49964
-5027	50037	-5000	49997	64+0.000	50085	50074	0.011	5000	49997	5041	50057
		-5000	50157	65+0.000	50245	50139	0.106	5000	50157	5040	50217
-5942	49653	-5000	50281	66+0.000	50369	50051	0.318	5000	50281	5397	50017
-6035	49645	-5000	50335	67+0.000	50423	49974	0.449	5000	50335	5512	49994
-6108	49579	-5000	50318	68+0.000	50406	49894	0.511	5000	50318	5393	50056
-5914	49620	-5000	50229	69+0.000	50317	49837	0.480	5000	50229	5439	49937
-5630	49686	-5000	50106	70+0.000	50194	49820	0.374	5000	50106	5356	49869
-5431	49694	-5000	49982	71+0.000	50070	49806	0.264	5000	49982	5263	49807

NOTA DE SERVIÇO											
Alinhamento: Rua Valdo Uchôa											
Lado Esquerdo				Eixo				Lado Direito			
OFFSET		BORDO		Estaca	Cota Projeto	Cota Terreno	Cota Vermelha	BORDO		OFFSET	
Afast. (m)	Cota (m)	Afast. (m)	Cota (m)					Afast. (m)	Cota (m)	Afast. (m)	Cota (m)
-5385	49601	-5000	49858	72+0.000	49946	49677	0.269	5000	49858	5189	49732
-5160	49628	-5000	49734	73+0.000	49822	49745	0.077	5000	49734	5109	49898
-5068	49712	-5000	49611	74+0.000	49699	49759	-0.060	5000	49611	5148	49832
-5090	49621	-5000	49487	75+0.000	49575	49657	-0.082	5000	49487	5188	49768
-5051	49439	-5000	49363	76+0.000	49451	49443	0.008	5000	49363	5191	49649
-5035	49209	-5000	49233	77+0.000	49321	49117	0.204	5000	49233	5058	49194
-5099	48988	-5000	49054	78+0.000	49142	48804	0.338	5000	49054	5226	48903
-5020	48851	-5000	48821	79+0.000	48909	48556	0.353	5000	48821	5182	48700
-5064	48498	-5000	48540	80+0.000	48628	48251	0.378	5000	48540	5100	48473
-5208	48114	-5000	48252	81+0.000	48340	47984	0.357	5000	48252	5045	48222
-5022	47950	-5000	47965	82+0.000	48053	47826	0.227	5000	47965	5038	47939
-5036	47730	-5000	47677	83+0.000	47765	47523	0.242	5000	47677	5021	47709
-5020	47419	-5000	47389	84+0.000	47477	47140	0.337	5000	47389		
-5119	47022	-5000	47101	85+0.000	47189	46757	0.433	5000	47101	5197	46970
-5133	46725	-5000	46814	86+0.000	46902	46441	0.461	5000	46814	5300	46614
-5279	46340	-5000	46526	87+0.000	46614	46147	0.467	5000	46526	5291	46332
-5555	45910	-5000	46279	88+0.000	46367	45960	0.407	5000	46279	5218	46134
-5299	45916	-5000	46115	89+0.000	46203	45760	0.443	5000	46115	5352	45881
-5511	45652	-5000	45993	90+0.000	46081	45754	0.326	5000	45993	5403	45724
-5642	45469	-5000	45898	91+0.000	45986	45690	0.296	5000	45898	5314	45688
-5799	45326	-5000	45858	92+0.000	45946	45602	0.344	5000	45858	5253	45690
-5764	45366	-5000	45875	93+0.000	45963	45646	0.317	5000	45875	5273	45693
-5579	45561	-5000	45947	94+0.000	46035	45715	0.320	5000	45947	5266	45770
-5460	45741	-5000	46047	95+0.000	46135	45751	0.384	5000	46047	5252	45879
-5500	45814	-5000	46147	96+0.000	46235	45887	0.348	5000	46147	5220	46001
-5475	45930	-5000	46247	97+0.000	46335	46084	0.251	5000	46247	5187	46122
-5601	45946	-5000	46347	98+0.000	46435	46081	0.354	5000	46347	5135	46257
-5622	45946	-5000	46361	99+0.000	46449	46062	0.387	5000	46361	5178	46242
-5490	45875	-5000	46202	100+0.000	46290	45988	0.302	5000	46202	5130	46115
-5513	45614	-5000	45956	101+0.000	46044	45813	0.231	5000	45956	5251	45788
-5552	45343	-5000	45710	102+0.000	45798	45453	0.345	5000	45710	5399	45444
-5678	45013	-5000	45465	103+0.000	45553	45036	0.517	5000	45465	5672	45017
-5962	44578	-5000	45219	104+0.000	45307	44596	0.712	5000	45219	6090	44493
-6347	44235	-5000	45133	105+0.000	45221	44442	0.780	5000	45133	6418	44188
-6601	44166	-5000	45233	106+0.000	45321	44434	0.888	5000	45233	6685	44110
-6573	44284	-5000	45333	107+0.000	45421	44446	0.975	5000	45333	6665	44223

4. QUADRO DE CUBAÇÃO

QUADRO DE CUBAÇÃO DE TERRAPLENAGEM – Rua Valdo Uchôa							
Estaca 0+00.000 a Estaca 119+19,38							
Estaca	Área (m²)		Volume (m³)		Volume Acumul. (m³)		Ordenada de Massa
	Corte	Aterro	Corte	Aterro	Corte	Aterro	
0+0.00	2.73	0.24	0.00	0.00	0.00	0.00	0.00
1+0.00	2.26	0.37	49.89	6.10	49.89	6.10	43.79
2+0.00	2.96	0.16	52.19	5.33	102.08	11.43	90.65
3+0.00	7.83	0.00	107.90	1.59	209.99	13.02	196.97
4+0.00	7.53	0.00	153.64	0.00	363.63	13.02	350.61
5+0.00	3.83	0.00	113.61	0.00	477.24	13.02	464.22
6+0.00	1.23	0.82	50.58	8.21	527.82	21.23	506.59
7+0.00	0.53	1.44	17.54	22.63	545.36	43.86	501.49
8+0.00	1.54	0.61	20.71	20.53	566.07	64.40	501.67
9+0.00	1.06	1.03	26.05	16.42	592.12	80.82	511.30
10+0.00	0.74	1.28	18.00	23.15	610.12	103.97	506.15
11+0.00	0.57	1.60	13.07	28.87	623.19	132.84	490.35
12+0.00	1.09	1.37	16.55	29.76	639.74	162.60	477.14
13+0.00	1.59	1.08	26.74	24.47	666.48	187.07	479.41
14+0.00	1.34	1.05	29.24	21.26	695.73	208.33	487.39
15+0.00	1.12	1.15	24.52	22.02	720.25	230.35	489.89
16+0.00	1.50	0.71	26.13	18.60	746.38	248.96	497.42
17+0.00	0.97	0.97	24.69	16.79	771.07	265.74	505.33
18+0.00	1.06	0.89	20.33	18.55	791.40	284.29	507.11
19+0.00	1.78	0.51	28.42	13.92	819.82	298.21	521.61
20+0.00	2.85	0.24	46.32	7.49	866.14	305.70	560.44
21+0.00	2.51	0.24	53.60	4.80	919.74	310.49	609.24
22+0.00	1.69	0.49	42.03	7.30	961.77	317.79	643.98
23+0.00	0.96	0.90	26.51	13.88	988.27	331.67	656.61
24+0.00	0.03	2.16	9.90	30.58	998.18	362.25	635.93
25+0.00	0.00	4.63	0.33	67.90	998.51	430.15	568.36
26+0.00	0.00	8.49	0.00	131.14	998.51	561.29	437.22
27+0.00	0.00	11.03	0.00	195.17	998.51	756.46	242.05
28+0.00	0.00	11.63	0.00	226.56	998.51	983.02	15.49
29+0.00	0.00	11.07	0.00	226.99	998.51	1,210.01	-211.51
30+0.00	0.00	9.68	0.00	207.52	998.51	1,417.54	-419.03
31+0.00	0.00	8.05	0.00	177.31	998.51	1,594.85	-596.34
32+0.00	0.00	5.75	0.00	138.03	998.51	1,732.87	-734.37

QUADRO DE CUBAÇÃO DE TERRAPLENAGEM – Rua Valdo Uchôa							
Estaca 0+00.000 a Estaca 119+19,38							
Estaca	Área (m²)		Volume (m³)		Volume Acumul. (m³)		Ordenada de Massa
	Corte	Aterro	Corte	Aterro	Corte	Aterro	
33+0.00	0.00	2.61	0.00	83.36	998.51	1,816.23	-817.73
34+0.00	1.29	0.59	12.88	32.03	1,011.38	1,848.26	-836.88
35+0.00	1.40	0.78	26.92	13.77	1,038.30	1,862.03	-823.73
36+0.00	1.13	1.13	25.31	19.17	1,063.62	1,881.20	-817.59
37+0.00	0.93	1.39	20.56	25.37	1,084.17	1,906.57	-822.40
38+0.00	1.12	0.80	20.54	21.95	1,104.71	1,928.52	-823.80
39+0.00	1.23	1.07	23.56	18.71	1,128.27	1,947.23	-818.96
40+0.00	0.78	1.42	20.17	24.85	1,148.44	1,972.08	-823.64
41+0.00	0.52	1.81	12.99	32.33	1,161.43	2,004.41	-842.98
42+0.00	0.80	1.70	13.13	35.15	1,174.56	2,039.56	-865.00
43+0.00	0.34	2.35	11.41	40.51	1,185.98	2,080.07	-894.10
44+0.00	0.05	2.40	3.90	47.44	1,189.88	2,127.51	-937.63
45+0.00	0.36	1.76	4.05	41.45	1,193.93	2,168.96	-975.04
46+0.00	0.63	1.64	9.83	34.02	1,203.76	2,202.98	-999.22
47+0.00	1.92	0.64	25.45	22.82	1,229.21	2,225.81	-996.60
48+0.00	2.48	0.23	43.94	8.75	1,273.15	2,234.56	-961.41
49+0.00	2.86	0.16	53.33	3.99	1,326.48	2,238.55	-912.06
50+0.00	2.00	0.36	48.59	5.25	1,375.07	2,243.79	-868.73
51+0.00	1.16	1.45	31.59	18.11	1,406.65	2,261.90	-855.25
52+0.00	0.17	2.39	13.22	38.41	1,419.87	2,300.31	-880.43
53+0.00	0.01	2.10	1.73	44.90	1,421.60	2,345.21	-923.61
54+0.00	0.12	1.69	1.29	37.89	1,422.89	2,383.10	-960.21
55+0.00	0.05	1.70	1.74	33.86	1,424.62	2,416.96	-992.34
56+0.00	0.01	1.79	0.65	34.84	1,425.28	2,451.80	-1,026.52
57+0.00	0.42	1.36	4.38	31.50	1,429.65	2,483.30	-1,053.65
58+0.00	0.00	2.29	4.28	36.53	1,433.93	2,519.83	-1,085.90
59+0.00	0.00	2.52	0.04	48.15	1,433.97	2,567.97	-1,134.00
60+0.00	0.04	2.19	0.36	47.10	1,434.33	2,615.07	-1,180.75
61+0.00	0.73	1.22	7.68	34.07	1,442.00	2,649.15	-1,207.14
62+0.00	2.22	0.17	29.49	13.90	1,471.49	2,663.05	-1,191.56
63+0.00	2.80	0.08	50.19	2.49	1,521.68	2,665.53	-1,143.85
64+0.00	2.45	0.45	52.57	5.33	1,574.25	2,670.87	-1,096.61
65+0.00	1.62	1.20	40.75	16.57	1,615.00	2,687.43	-1,072.43

QUADRO DE CUBAÇÃO DE TERRAPLENAGEM – Rua Valdo Uchôa							
Estaca 0+00.000 a Estaca 119+19,38							
Estaca	Área (m²)		Volume (m³)		Volume Acumul. (m³)		Ordenada de Massa
	Corte	Aterro	Corte	Aterro	Corte	Aterro	
66+0.00	0.30	2.42	19.21	36.13	1,634.21	2,723.56	-1,089.35
67+0.00	0.00	3.38	2.98	57.98	1,637.19	2,781.54	-1,144.35
68+0.00	0.00	3.98	0.00	73.57	1,637.19	2,855.11	-1,217.92
69+0.00	0.00	3.50	0.00	74.81	1,637.19	2,929.92	-1,292.73
70+0.00	0.05	2.50	0.52	60.05	1,637.71	2,989.97	-1,352.27
71+0.00	0.66	1.83	7.12	43.24	1,644.83	3,033.21	-1,388.38
72+0.00	1.05	1.25	17.09	30.81	1,661.92	3,064.03	-1,402.10
73+0.00	2.34	0.42	33.89	16.75	1,695.81	3,080.78	-1,384.97
74+0.00	2.98	0.21	53.27	6.25	1,749.08	3,087.03	-1,337.95
75+0.00	3.15	0.12	61.35	3.26	1,810.43	3,090.29	-1,279.86
76+0.00	2.61	0.24	57.61	3.61	1,868.03	3,093.90	-1,225.86
77+0.00	1.31	0.69	39.14	9.33	1,907.17	3,103.22	-1,196.05
78+0.00	0.69	1.15	19.91	18.38	1,927.08	3,121.60	-1,194.52
79+0.00	0.33	1.10	10.16	22.53	1,937.24	3,144.14	-1,206.89
80+0.00	0.30	0.94	6.27	20.44	1,943.51	3,164.58	-1,221.07
81+0.00	0.29	1.25	5.87	21.88	1,949.38	3,186.46	-1,237.08
82+0.00	1.10	0.87	13.86	21.17	1,963.25	3,207.64	-1,244.39
83+0.00	0.97	0.84	20.68	17.09	1,983.93	3,224.72	-1,240.79
84+0.00	0.39	0.92	13.63	17.60	1,997.56	3,242.33	-1,244.76
85+0.00	0.00	1.62	3.91	25.40	2,001.47	3,267.73	-1,266.26
86+0.00	0.00	1.85	0.00	34.67	2,001.47	3,302.40	-1,300.93
87+0.00	0.00	1.82	0.00	36.63	2,001.47	3,339.03	-1,337.56
88+0.00	0.38	1.57	3.82	33.82	2,005.30	3,372.85	-1,367.55
89+0.00	0.00	2.11	3.82	36.74	2,009.12	3,409.58	-1,400.46
90+0.00	0.18	1.96	1.84	40.71	2,010.96	3,450.30	-1,439.34
91+0.00	0.54	2.01	7.27	39.72	2,018.23	3,490.02	-1,471.79
92+0.00	0.09	2.45	6.35	44.54	2,024.58	3,534.57	-1,509.98
93+0.00	0.40	2.06	4.89	45.09	2,029.47	3,579.66	-1,550.19
94+0.00	0.47	1.81	8.70	38.65	2,038.17	3,618.31	-1,580.14
95+0.00	0.37	1.56	8.40	33.77	2,046.57	3,652.08	-1,605.51
96+0.00	0.58	1.51	9.51	30.73	2,056.08	3,682.80	-1,626.73
97+0.00	1.06	1.35	16.38	28.67	2,072.46	3,711.47	-1,639.01
98+0.00	0.27	1.67	13.31	30.21	2,085.77	3,741.69	-1,655.91

QUADRO DE CUBAÇÃO DE TERRAPLENAGEM – Rua Valdo Uchôa							
Estaca 0+00.000 a Estaca 119+19,38							
Estaca	Área (m²)		Volume (m³)		Volume Acumul. (m³)		Ordenada de Massa
	Corte	Aterro	Corte	Aterro	Corte	Aterro	
99+0.00	0.11	1.88	3.83	35.49	2,089.60	3,777.17	-1,687.57
100+0.00	0.59	1.42	6.99	33.00	2,096.59	3,810.17	-1,713.58
101+0.00	0.79	1.71	13.80	31.30	2,110.39	3,841.47	-1,731.09
102+0.00	0.13	2.26	9.27	39.63	2,119.65	3,881.11	-1,761.45
103+0.00	0.00	3.93	1.35	61.86	2,121.00	3,942.97	-1,821.96
104+0.00	0.00	6.29	0.00	102.18	2,121.00	4,045.15	-1,924.14
105+0.00	0.00	8.09	0.00	143.77	2,121.00	4,188.92	-2,067.91
106+0.00	0.00	9.85	0.00	179.32	2,121.00	4,368.24	-2,247.24
107+0.00	0.00	10.24	0.00	200.86	2,121.00	4,569.10	-2,448.10
108+0.00	0.00	10.22	0.00	204.53	2,121.00	4,773.64	-2,652.63
109+0.00	0.00	9.93	0.00	201.48	2,121.00	4,975.12	-2,854.11
110+0.00	0.00	7.79	0.00	177.09	2,121.00	5,152.21	-3,031.20
111+0.00	0.00	4.87	0.00	126.54	2,121.00	5,278.74	-3,157.74
112+0.00	0.00	3.72	0.00	85.85	2,121.00	5,364.60	-3,243.59
113+0.00	0.00	3.61	0.00	73.27	2,121.00	5,437.87	-3,316.87
114+0.00	0.00	3.70	0.00	73.10	2,121.00	5,510.97	-3,389.96
115+0.00	0.00	2.66	0.00	63.57	2,121.00	5,574.54	-3,453.53
116+0.00	0.16	1.68	1.57	43.37	2,122.57	5,617.91	-3,495.34
117+0.00	0.36	1.77	5.19	34.51	2,127.76	5,652.42	-3,524.65
118+0.00	1.26	1.10	16.23	28.74	2,143.99	5,681.16	-3,537.17
119+0.00	2.29	0.63	35.53	17.31	2,179.52	5,698.47	-3,518.95
119+19.38	2.76	0.19	48.97	7.97	2,228.49	5,706.44	-3,477.95