

MEMÓRIA DE CÁLCULO

PAVIMENTAÇÃO ASFÁLTICA DA RUA 21 DE ABRIL

Pavimentação asfáltica de vias públicas do município de Buritizeiro-MG
CT nº897054/2019 - Operação 1069344-68/2020/MDEV

1 - SERVIÇOS PRELIMINARES

1.1 – PLACA DE OBRA

3,00 m x 1,50 m

Total: 4,50 m²

1.2- LIMPEZA MACANIZADA DE CAMADA VEGETAL

TRECHO 01 – $(10,4459\text{m} \times 10,00\text{m}) / 2 = 52,22 \text{ m}^2$

$(10,4145\text{m} \times 10,00\text{m}) / 2 = 52,02$

$(84,6653 \text{ m} + 78,8075\text{m}) \times 10,00 / 2 = 817,36 \text{ m}^2$

TRECHO 02 – $(84,7877 \text{ m} + 78,8075\text{m}) \times 10,00 \text{ m} / 2 = 817,97 \text{ m}^2$

TRECHO 03 – $(78,8075 \text{ m} + 85,00 \text{ m}) \times 10,00\text{m} / 2 = 819,03 \text{ m}^2$

TRECHO 04 - $(9,20\text{m} \times 10,00\text{m}) / 2 = 46,00 \text{ m}^2$

$(10,00\text{m} \times 10,00 \text{ m}) / 2 = 50,00 \text{ m}^2$

$(85,3721\text{m} + 78,9296\text{m}) \times 10,00\text{m} / 2 = 821,51 \text{ m}^2$

Total: 3476,11 m²

1.2 – SERVIÇOS TOPOGRÁFICOS

Total: 50,00 pontos

2- ADMINISTRAÇÃO LOCAL

2.1 – ENGENHEIRO CIVIL

1,00h por dia x 60,00 dias = 60,00h

Total: 60,00h

2.2 – ENCARREGADO GERAL

6,00h por dia x 60,00 dias = 360,00h

Total: 360,00h

2.3 – TÉCNICO EM SEGURANÇA DO TRABALHO

1,00h por dia x 60,00 dias = 60,00h

Total: 60,00h

2.4 – APONTADOR

1,00h por dia x 60,00 dias = 60,00h

Total: 60,00h

3 – CALÇADA

3.1 – EXECUÇÃO DE PASSEIO (CALÇADA)

TRECHO 01 – $84,66\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,85\text{ m}^2$

TRECHO 02 – $84,78\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,95\text{ m}^2$

TRECHO 03 – $78,80\text{m} + 85,00\text{m} \times 2,50\text{m} = 409,50\text{ m}^2$

TRECHO 04 – $85,37\text{m} + 78,92\text{m} \times 2,50\text{m} = 410,72\text{ m}^2$

Total: $408,85\text{ m}^2 + 408,95\text{ m}^2 + 409,50\text{ m}^2 + 410,72\text{ m}^2 \times 0,07\text{ m} = 114,66\text{m}^3$

3.2 – REGULARIZAÇÃO E COMPACTAÇÃO

TRECHO 01 – $84,66\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,85\text{ m}^2$

TRECHO 02 – $84,78\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,95\text{ m}^2$

TRECHO 03 – $78,80\text{m} + 85,00\text{m} \times 2,50\text{m} = 409,50\text{ m}^2$

TRECHO 04 – $85,37\text{m} + 78,92\text{m} \times 2,50\text{m} = 410,72\text{ m}^2$

Total: $408,85\text{ m}^2 + 408,95\text{ m}^2 + 409,50\text{ m}^2 + 410,72\text{ m}^2 = 1638,02\text{m}^2$

3.3 – MATERIAL PARA ATERRO DE 1ª CATEGORIA

TRECHO 01 – $(84,66\text{m} + 78,80\text{m}) \times 2,50\text{m} = 408,85\text{ m}^2$

TRECHO 02 – $84,78\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,95\text{ m}^2$

TRECHO 03 – $78,80\text{m} + 85,00\text{m} \times 2,50\text{m} = 409,50\text{ m}^2$

TRECHO 04 – $85,37\text{m} + 78,92\text{m} \times 2,50\text{m} = 410,72\text{ m}^2$

Total: $408,85\text{ m}^2 + 408,95\text{ m}^2 + 409,50\text{ m}^2 + 410,72\text{ m}^2 \times 0,08\text{ m} = 131,04\text{m}^3$

3.4 – TRANSPORTE COM CAMINHÃO 10 M³

TRECHO 01 – $84,66\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,85\text{ m}^2$

TRECHO 02 – $84,78\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,95\text{ m}^2$

TRECHO 03 – $78,80\text{m} + 85,00\text{m} \times 2,50\text{m} = 409,50\text{ m}^2$

TRECHO 04 – $85,37\text{m} + 78,92\text{m} \times 2,50\text{m} = 410,72\text{ m}^2$

Total: $408,85\text{ m}^2 + 408,95\text{ m}^2 + 409,50\text{ m}^2 + 410,72\text{ m}^2 \times 0,08\text{ m} \times 11,60\text{ km} = 1520,08\text{m}^3 \times \text{km}$

3.5 – EXECUÇÃO E COMPACTAÇÃO DE ATERRO

TRECHO 01 – $84,66\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,85\text{ m}^2$

TRECHO 02 – $84,78\text{m} + 78,80\text{m} \times 2,50\text{m} = 408,95\text{ m}^2$

TRECHO 03 – $78,80\text{m} + 85,00\text{m} \times 2,50\text{m} = 409,50\text{ m}^2$

TRECHO 04 – $85,37\text{m} + 78,92\text{m} \times 2,50\text{m} = 410,72\text{ m}^2$

Total: $408,85\text{ m}^2 + 408,95\text{ m}^2 + 409,50\text{ m}^2 + 410,72\text{ m}^2 \times 0,08\text{ m} = 131,04\text{m}^3$

4- MOVIMENTAÇÃO DE TERRA

4.1 – REGULARIZAÇÃO DO SUBLEITO

TRECHO 01 – $(10,4459\text{m} \times 10,00\text{m}) / 2 = 52,22\text{ m}^2$

$(10,4145\text{m} \times 10,00\text{m}) / 2 = 52,02$

$(84,6653\text{m} + 78,8075\text{m}) \times 10,00 / 2 = 817,36\text{ m}^2$

TRECHO 02 – $(84,7877\text{m} + 78,8075\text{m}) \times 10,00 / 2 = 817,97\text{ m}^2$

TRECHO 03 – $(78,8075\text{m} + 85,00\text{m}) \times 10,00 / 2 = 819,03\text{ m}^2$

TRECHO 04 – $(9,20\text{m} \times 10,00\text{m}) / 2 = 46,00\text{ m}^2$

$(10,00\text{m} \times 10,00\text{m}) / 2 = 50,00\text{ m}^2$

$(85,3721\text{m} + 78,9296\text{m}) \times 10,00 / 2 = 821,51\text{ m}^2$

Total: 3476,11 m²

4.2 – ESCAVAÇÕES CARGA E TRANSPORTE DO SUBLEITO

TRECHO 01 – $(10,4459\text{m} \times 10,00\text{m}) / 2 = 52,22 \text{ m}^2 \times 0,20\text{m} = 10,44 \text{ m}^3$

$(10,4145\text{m} \times 10,00\text{m}) / 2 = 52,02 \text{ m}^2 \times 0,20\text{m} = 10,40 \text{ m}^3$

$(84,6653 \text{ m} + 78,8075\text{m}) \times 10,00 / 2 = 817,36 \text{ m}^2 \times 0,20 \text{ m} = 163,47 \text{ m}^3$

TRECHO 02 – $(84,7877 \text{ m} + 78,8075\text{m}) \times 10,00 \text{ m} / 2 = 817,97 \text{ m}^2 \times 0,20\text{m} = 163,59 \text{ m}^3$

TRECHO 03 – $(78,8075 \text{ m} + 85,00 \text{ m}) \times 10,00\text{m} / 2 = 819,03 \text{ m}^2 \times 0,20\text{m} = 163,80 \text{ m}^3$

TRECHO 04 - $(9,20\text{m} \times 10,00\text{m}) / 2 = 46,00 \text{ m}^2 \times 0,20 \text{ m} = 9,20 \text{ m}^3$

$(10,00\text{m} \times 10,00 \text{ m}) / 2 = 50,00 \text{ m}^2 \times 0,20 \text{ m} = 10,00 \text{ m}^3$

$(85,3721\text{m} + 78,9296\text{m}) \times 10,00\text{m} / 2 = 821,51 \text{ m}^2 \times 0,20 \text{ m} = 164,30 \text{ m}^3$

Total: 965,20 m³

4.3 – TRANSPORTE COM CAMINHÃO BASCULANTE 10M³

TRECHO 01 – $(10,4459\text{m} \times 10,00\text{m}) / 2 = 52,22 \text{ m}^2 \times 0,20\text{m} = 10,44 \text{ m}^3 \times 11,60 \text{ km} = 121,10\text{m}^3 \times \text{km}$

$(10,4145\text{m} \times 10,00\text{m}) / 2 = 52,02 \text{ m}^2 \times 0,20\text{m} = 10,40 \text{ m}^3 \times 11,60 \text{ km} = 120,64 \text{ m}^3 \times \text{km}$

$(84,6653 \text{ m} + 78,8075\text{m}) \times 10,00 / 2 = 817,36 \text{ m}^2 \times 0,20 \text{ m} = 163,47 \text{ m}^3 \times 11,60\text{km} = 1896,25\text{m}^3 \times \text{km}$

TRECHO 02 – $(84,7877 \text{ m} + 78,8075\text{m}) \times 10,00 \text{ m} / 2 = 817,97 \text{ m}^2 \times 0,20\text{m} = 163,59 \text{ m}^3 \times 11,60 \text{ km} = 1897,64 \text{ m}^3 \times \text{km}$

TRECHO 03 – $(78,8075 \text{ m} + 85,00 \text{ m}) \times 10,00\text{m} / 2 = 819,03 \text{ m}^2 \times 0,20\text{m} = 163,80 \text{ m}^3 \times 11,60\text{km} = 1900,08 \text{ m}^3 \times \text{km}$

TRECHO 04 - $(9,20\text{m} \times 10,00\text{m}) / 2 = 46,00 \text{ m}^2 \times 0,20 \text{ m} = 9,20 \text{ m}^3 \times 11,60 \text{ km} = 106,72 \text{ m}^3 \times \text{km}$

$(10,00\text{m} \times 10,00 \text{ m}) / 2 = 50,00 \text{ m}^2 \times 0,20 \text{ m} = 10,00 \text{ m}^3 \times 11,60 \text{ km} = 116,00 \text{ m}^3 \times \text{km}$

$(85,3721\text{m} + 78,9296\text{m}) \times 10,00\text{m} / 2 = 821,51\text{m}^2 \times 0,20 \text{ m} = 164,30 \text{ m}^3 \times 11,60 \text{ km} = 1905,88\text{m}^3 \times \text{km}$

Total: 8064,31 m³ x km

4.4 – EXECUÇÃO E COMPACTAÇÃO DE SUB-BASE PARA PAVIMENTAÇÃO

TRECHO 01 – $(10,4459\text{m} \times 10,00\text{m}) / 2 = 52,22 \text{ m}^2 \times 0,20\text{m} = 10,44 \text{ m}^3$

$(10,4145\text{m} \times 10,00\text{m}) / 2 = 52,02 \text{ m}^2 \times 0,20\text{m} = 10,40 \text{ m}^3$

$(84,6653 \text{ m} + 78,8075\text{m}) \times 10,00 / 2 = 817,36 \text{ m}^2 \times 0,20 \text{ m} = 163,47 \text{ m}^3$

TRECHO 02 – $(84,7877 \text{ m} + 78,8075\text{m}) \times 10,00 \text{ m} / 2 = 817,97 \text{ m}^2 \times 0,20\text{m} = 163,59 \text{ m}^3$

TRECHO 03 – $(78,8075 \text{ m} + 85,00 \text{ m}) \times 10,00\text{m} / 2 = 819,03 \text{ m}^2 \times 0,20\text{m} = 163,80 \text{ m}^3$

TRECHO 04 - $(9,20\text{m} \times 10,00\text{m}) / 2 = 46,00 \text{ m}^2 \times 0,20 \text{ m} = 9,20 \text{ m}^3$

$(10,00\text{m} \times 10,00 \text{ m}) / 2 = 50,00 \text{ m}^2 \times 0,20 \text{ m} = 10,00 \text{ m}^3$

$(85,3721\text{m} + 78,9296\text{m}) \times 10,00\text{m} / 2 = 821,51 \text{ m}^2 \times 0,20 \text{ m} = 164,30 \text{ m}^3$

Total: 965,20 m³

4.5 – EXECUÇÃO E COMPACTAÇÃO DE BASE COM BRITA CORRIDA

TRECHO 01 – $(10,4459\text{m} \times 10,00\text{m}) / 2 = 52,22 \text{ m}^2 \times 0,15\text{m} = 7,83 \text{ m}^3$

$(10,4145\text{m} \times 10,00\text{m}) / 2 = 52,02 \text{ m}^2 \times 0,15\text{m} = 7,80 \text{ m}^3$

$(84,6653 \text{ m} + 78,8075\text{m}) \times 10,00 / 2 = 817,36 \text{ m}^2 \times 0,15 \text{ m} = 122,60 \text{ m}^3$

TRECHO 02 – $(84,7877 \text{ m} + 78,8075\text{m}) \times 10,00 \text{ m} / 2 = 817,97 \text{ m}^2 \times 0,15\text{m} = 122,69 \text{ m}^3$

TRECHO 03 – $(78,8075 \text{ m} + 85,00 \text{ m}) \times 10,00\text{m} / 2 = 819,03 \text{ m}^2 \times 0,15\text{m} = 122,85 \text{ m}^3$

TRECHO 04 - $(9,20\text{m} \times 10,00\text{m})/2 = 46,00 \text{ m}^2 \times 0,15 \text{ m} = 6,90 \text{ m}^3$
 $(10,00\text{m} \times 10,00 \text{ m})/ 2 = 50,00 \text{ m}^2 \times 0,15 \text{ m} = 7,50 \text{ m}^3$
 $(85,3721\text{m}+78,9296\text{m}) \times 10,00\text{m} / 2 = 821,51 \text{ m}^2 \times 0,15 \text{ m} = 123,22 \text{ m}^3$
Total: 521,39 m³

4.6 – TRANSPORTE COM CAMINHÃO BASCULANTE 10 M³

521,39 m³ x 11,60 Km

Total: 6048,12 m³ x km

5 – PAVIMENTAÇÃO

5.1 – EXECUÇÃO DE IMPRIMAÇÃO CM-30

TRECHO 01 – $(10,4459\text{m} \times 9,00\text{m})/2 = 47,00 \text{ m}^2$

$(10,4145\text{m} \times 9,00\text{m}) / 2 = 46,86 \text{ m}^2$

$(84,6653 \text{ m} + 78,8075\text{m}) \times 9,00/ 2 = 735,63 \text{ m}^2$

TRECHO 02 – $(84,7877 \text{ m} + 78,8075 \text{ m}) \times 9,00 \text{ m}/ 2 = 736,17 \text{ m}^2$

TRECHO 03 – $(78,8075 \text{ m} + 85,00 \text{ m}) \times 9,00 \text{ m}/2 = 737,13 \text{ m}^2$

TRECHO 04 - $(9,20\text{m} \times 9,00\text{m}) / 2 = 41,40 \text{ m}^2$

$(10,00\text{m} \times 9,00 \text{ m}) / 2 = 45,00 \text{ m}^2$

$(85,3721 \text{ m} + 78,9296 \text{ m}) \times 9,00\text{m} / 2 = 739,36 \text{ m}^2$

Total: 3128,54 m²

5.2 – TRANSPORTE DE MATERIAL ASFÁLTICO CM-30

TRECHO 01 – $1,3077 \text{ m}^3 \times 0,17 \text{ ton}/\text{m}^3 \times 183,00 \text{ Km} = 40,68 \text{ ton} \times \text{Km}$

TRECHO 02 - $1,3087 \text{ m}^3 \times 0,17 \text{ ton}/\text{m}^3 \times 183,00 \text{ Km} = 40,71 \text{ ton} \times \text{Km}$

TRECHO 03 - $1,3104 \text{ m}^3 \times 0,17 \text{ ton}/\text{m}^3 \times 183,00 \text{ Km} = 40,76 \text{ ton} \times \text{Km}$

TRECHO 04 - $1,3144 \text{ m}^3 \times 0,17 \text{ ton}/\text{m}^3 \times 183,00 \text{ Km} = 40,89 \text{ ton} \times \text{Km}$

Total = 163,04 ton x Km

5.3 – PINTURA DE LIGAÇÃO COM EMULSÃO ASFÁLTICA

TRECHO 01 – $(10,4459\text{m} \times 9,00\text{m})/2 = 47,00 \text{ m}^2$

$(10,4145\text{m} \times 9,00\text{m})/2 = 46,86$

$(84,6653 \text{ m} + 78,8075\text{m}) \times 9,00/ 2 = 735,63 \text{ m}^2$

TRECHO 02 – $(84,7877 \text{ m} + 78,8075\text{m}) \times 9,00 \text{ m}/ 2 = 736,17 \text{ m}^2$

TRECHO 03 – $(78,8075 \text{ m} + 85,00 \text{ m}) \times 9,00\text{m}/2 = 737,13 \text{ m}^2$

TRECHO 04 - $(9,20\text{m} \times 9,00\text{m})/2 = 41,40 \text{ m}^2$

$(10,00\text{m} \times 9,00 \text{ m})/ 2 = 45,00 \text{ m}^2$

$(85,3721\text{m}+78,9296\text{m}) \times 9,00\text{m} / 2 = 739,35 \text{ m}^2$

Total: 3128,54 m²

5.4 – TRANSPORTE DE MATERIAL ASFÁLTICO PARA PINTURA DE LIGAÇÃO COM EMULSÃO ASFÁLTICA

TRECHO 01 – $1,3077 \text{ m}^3 \times 0,17 \text{ ton}/\text{m}^3 \times 183,00 \text{ Km} = 40,68 \text{ ton} \times \text{Km}$

TRECHO 02 - $1,3087 \text{ m}^3 \times 0,17 \text{ ton}/\text{m}^3 \times 183,00 \text{ Km} = 40,71 \text{ ton} \times \text{Km}$

TRECHO 03 - $1,3104 \text{ m}^3 \times 0,17 \text{ ton}/\text{m}^3 \times 183,00 \text{ Km} = 40,76 \text{ ton} \times \text{Km}$

TRECHO 04 - $1,3144 \text{ m}^3 \times 0,17 \text{ ton}/\text{m}^3 \times 183,00 \text{ Km} = 40,89 \text{ ton} \times \text{Km}$

Total = 163,04 ton x Km



5.5 – APLICAÇÃO DE CBUQ

TRECHO 01 – $826,49 \text{ m}^2 \times 0,035 \text{ m} = 28,92 \text{ m}^3$

TRECHO 02 – $736,17 \text{ m}^2 \times 0,035 \text{ m} = 25,76 \text{ m}^3$

TRECHO 03 – $737,13 \text{ m}^2 \times 0,035 \text{ m} = 25,79 \text{ m}^3$

TRECHO 04 – $825,75 \text{ m}^2 \times 0,035 \text{ m} = 28,90 \text{ m}^3$

Total: 109,37 m³

5.6 – TRANSPORTE DE MATERIAL ASFÁLTICO

TRECHO 01 – $826,49 \text{ m}^2 \times 0,035 \text{ m} \times 2,40 \text{ t/m}^3 \times 183,00 \text{ km} = 12704,80 \text{ T} \times \text{km}$

TRECHO 02 – $736,17 \text{ m}^2 \times 0,035 \text{ m} \times 2,40 \text{ t/m}^3 \times 183,00 \text{ km} = 11316,40 \text{ T} \times \text{km}$

TRECHO 03 – $737,13 \text{ m}^2 \times 0,035 \text{ m} \times 2,40 \text{ t/m}^3 \times 183,00 \text{ km} = 11331,16 \text{ T} \times \text{km}$

TRECHO 04 – $825,75 \text{ m}^2 \times 0,035 \text{ m} \times 2,40 \text{ t/m}^3 \times 183,00 \text{ km} = 12693,42 \text{ T} \times \text{km}$

Total: 48045,78 TXKM

6 – DRENAGEM E URBANIZAÇÃO

6.1 – MEIO FIO E SARJETA

TRECHO 01 – $84,66 \text{ m} + 78,80 \text{ m} = 163,54 \text{ m}$

TRECHO 02 – $84,78 \text{ m} + 78,80 \text{ m} = 163,58 \text{ m}$

TRECHO 03 – $78,80 \text{ m} + 85,00 \text{ m} = 163,80 \text{ m}$

TRECHO 04 – $85,37 \text{ m} + 78,92 \text{ m} = 164,29 \text{ m}$

Total: 655,21 m

7 – SINALIZAÇÃO

7.1 – PLACA DE SINALIZAÇÃO

$0,50 \text{ m} \times 0,50 \text{ m} \times 8,00 = 2,00 \text{ m}^2$

Total: 2,00 m²

7.2 – TUBO DE AÇO GALVANIZADO PARA PLACA DE SINALIZAÇÃO

$2,50 \text{ m} \times 8,00 = 20 \text{ m}$

Total: 20,00m

7.3 – SINALIZAÇÃO HORIZONTAL (FAIXA DE PEDESTRE)

$16,96 \text{ m}^2 \times 4,00 = 67,84 \text{ m}^2$

Total: 67,84m²

8 – ACESSIBILIDADE

8.1 – PISO PODOTÁTIL ALERTA

$3,82 \text{ m}^2 \times 8,00 = 30,56 \text{ m}^2$

Total: 30,56m²

8.2 – PISO PODOTÁTIL DIRECIONAL

$21,36 \text{ m}^2 + 19,90 \text{ m}^2 + 21,39 \text{ m}^2 + 19,90 \text{ m}^2 + 19,90 \text{ m}^2 + 21,44 \text{ m}^2 + 19,94 \text{ m}^2 + 21,54 \text{ m}^2 + =$
 $165,37 \text{ m}^2$

8.3 – RAMPA PARA ACESSO DE DEFICIENTE
Total: 8,00 unidades

Buritizeiro, 01 de Julho de 2021.



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