



MEMORIAL DE CÁLCULO

Objeto: Reforma da Escola Municipal Nelcino Manoel da Silva;

Endereço: Córrego São Domingos, Zona Rural - Lajinha/MG.

Os quantitativos relacionados neste memorial de cálculo foram obtidos através de levantamento arquitetônico com auxílio de software, observando os reparos necessários a serem executados na Escola Municipal Nelcino Manoel da Silva

1.0 - ALVENARIA

1.1 - CONSTRUÇÃO DE ALVENARIA

$$(1,60 \times 2,94) = 4,70 \text{ m}^2$$

$$(0,70 \times 0,80) = 0,56 \text{ m}^2$$

TOTAL: 5,26 m²

2.0 - PISOS E REVESTIMENTOS

2.1 – DEMOLIÇÃO REVESTIMENTO CERÂMICO

BANHEIRO FEMININO

$$(1,46 + 1,46 + 1,22 + 1,22) = 5,36 \times 1,40 = 7,50 \text{ m}^2$$

Descontos:

$$0,80 \times 2,10 = 1,68 \text{ m}^2$$

$$0,63 \times 0,54 = 0,34 \text{ m}^2$$

$$\text{Subtotal: } (7,50 - 2,02) = 5,48 \text{ m}^2$$

BANHEIRO MASCULINO

$$(1,46 + 1,46 + 1,20 + 1,20) = 5,32 \times 1,40 = 7,45 \text{ m}^2$$

Descontos:

$$0,80 \times 2,10 = 1,68 \text{ m}^2$$

$$0,63 \times 0,54 = 0,34 \text{ m}^2$$

$$\text{Subtotal: } (7,45 - 2,02) = 5,43 \text{ m}^2$$



PREFEITURA DE LAJINHA

BANHEIRO PROFESSORES

$$(1,46+1,46+1,28+1,28) = 5,48 \times 1,40 = 7,67 \text{ m}^2$$

$$0,80 \times 2,10 = 1,68 \text{ m}^2$$

$$0,63 \times 0,54 = 0,34 \text{ m}^2$$

$$\text{Subtotal: } (7,67 - 2,02) = 5,65 \text{ m}^2$$

TOTAL: 16,56 m²

2.2 - REVESTIMENTO CERÂMICO – PAREDE

COZINHA

$$(4,0+4,0+4,0+4,0) = 16,0 \times 2,83 = 45,28 \text{ m}^2$$

Descontos:

$$0,80 \times 2,10 = 1,68 \text{ m}^2$$

$$0,98 \times 0,50 = 0,49 \text{ m}^2$$

$$\text{Subtotal: } (45,28 - 2,17) = 43,11 \text{ m}^2$$

BANHEIRO FEMININO

$$(1,46+1,46+1,22+1,22) = 5,36 \times 2,83 = 15,17 \text{ m}^2$$

Descontos:

$$0,80 \times 2,10 = 1,68 \text{ m}^2$$

$$0,63 \times 0,54 = 0,34 \text{ m}^2$$

$$\text{Subtotal: } (15,17 - 2,02) = 13,15 \text{ m}^2$$

BANHEIRO MASCULINO

$$(1,46+1,46+1,20+1,20) = 5,32 \times 2,83 = 15,06 \text{ m}^2$$

Descontos:

$$0,80 \times 2,10 = 1,68 \text{ m}^2$$

$$0,63 \times 0,54 = 0,34 \text{ m}^2$$

$$\text{Subtotal: } (15,06 - 2,02) = 13,04 \text{ m}^2$$

BANHEIRO PROFESSORES



PREFEITURA DE LAJINHA

$$(1,46+1,46+1,28+1,28) = 5,48 \times 2,83 = 15,50 \text{ m}^2$$

$$0,80 \times 2,10 = 1,68 \text{ m}^2$$

$$0,63 \times 0,54 = 0,34 \text{ m}^2$$

$$\text{Subtotal: } (15,50 - 2,02) = 13,48 \text{ m}^2$$

$$\text{TOTAL: } 82,78 + 10\% = 91,06 \text{ m}^2$$

2.3 – CHAPISCO

$$(1,60 \times 2,94) = 4,70 \text{ m}^2$$

$$(0,70 \times 0,80) = 0,56 \text{ m}^2$$

$$\text{TOTAL: } 5,26 \text{ m}^2$$

2.4 – EMBOÇO

$$(1,60 \times 2,94) = 4,70 \text{ m}^2$$

$$(0,70 \times 0,80) = 0,56 \text{ m}^2$$

$$\text{TOTAL: } 5,26 \text{ m}^2$$

2.5 – REBOCO

$$(7,23+11,75+4,19+8,04+4,19+7,53+20,92) = 63,85 \times 1,60 = 102,16 \text{ m}^2$$

$$(1,60 \times 2,94) = 4,70 \text{ m}^2$$

$$(0,70 \times 0,80) = 0,56 \text{ m}^2$$

$$\text{TOTAL: } 107,42 \text{ m}^2$$

2.6 - PISO CERÂMICO

$$\text{SALA DE AULA 1} = 36,11 \text{ m}^2$$

$$\text{SALA DE AULA 2} = 41,86 \text{ m}^2$$

$$\text{COZINHA} = 16,00 \text{ m}^2$$

$$\text{REFEITÓRIO} = 31,26 \text{ m}^2$$

$$\text{CIRCULAÇÃO} = 44,32 \text{ m}^2$$

$$\text{BANHEIRO FEMININO} = 1,78 \text{ m}^2$$

$$\text{BANHEIRO MASCULINO} = 1,75 \text{ m}^2$$



PREFEITURA DE LAJINHA

BANHEIRO PROFESSORES = 1,86 m²

TOTAL: 174,94 + 10% = 192,43 m²

2.7 – CONTRAPISO

SALA DE AULA 1 = 36,11 m²

SALA DE AULA 2 = 41,86 m²

COZINHA = 16,00 m²

REFEITÓRIO = 31,26 m²

CIRCULAÇÃO = 44,32 m²

BANHEIRO FEMININO = 1,78 m²

BANHEIRO MASCULINO = 1,75 m²

BANHEIRO PROFESSORES = 1,86 m²

TOTAL: 174,94 + 10% = 192,43 m²

3.0 – COBERTURAS E FORROS

3.1 – FORRO

SALA DE AULA 1 = 36,11 m²

SALA DE AULA 2 = 41,86 m²

COZINHA = 16,00 m²

REFEITÓRIO = 31,26 m²

CIRCULAÇÃO = 44,32 m²

BANHEIRO FEMININO = 1,78 m²

BANHEIRO MASCULINO = 1,75 m²

BANHEIRO PROFESSORES = 1,86 m²

3.2 – ENGRADAMENTO COBERTURA

Área Total: 61,30 m²

3.3 – TELHA CERÂMICA

Área Total: 61,30 m²



PREFEITURA DE LAJINHA

4.0 – PINTURA

4.1 – MASSA CORRIDA ACRILICA

FACHADA = $(7,23+11,75+4,19+8,04+4,19+7,53+20,92) = 63,85 \times 3,80 = 242,63 \text{ m}^2$

$(1,60 \times 2,94) = 4,70 \times 2,0 = 9,41 \text{ m}^2$

$(2,33+24,0+4,54) = 30,87 \times 0,92 = 28,40 \text{ m}^2$

Descontos:

$(0,98 \times 0,50) = 0,49 \text{ m}^2$

$(1,97 \times 1,18) = 2,32 \text{ m}^2$

$(0,90 \times 2,10) = 1,89 \times 2,0 = 3,78 \text{ m}^2$

$(1,97 \times 1,28) = 2,52 \times 6,0 = 15,12 \text{ m}^2$

$(0,80 \times 2,10) = 1,68 \text{ m}^2$

$(1,0 \times 1,0) = 1,0 \text{ m}^2$

$(0,63 \times 0,54) = 0,34 \text{ m}^2$

TOTAL: $(280,44 - 24,73) = 255,71 \text{ m}^2$

4.2 – MASSA CORRIDA PVA

SALA DE AULA 1 = $(7,23+7,23+5,79+5,79) = 26,04 \times 2,90 = 75,52 \text{ m}^2$

Descontos:

$0,80 \times 2,10 = 1,68 \text{ m}^2$

$1,97 \times 1,28 = 2,52 \text{ m}^2$

Subtotal: $(75,52 - 4,20) = 71,32 \text{ m}^2$

SALA DE AULA 2 = $(6,06+6,06+5,96+5,96) = 24,04 \times 2,90 = 69,72 \text{ m}^2$

Descontos:

$0,80 \times 2,10 = 1,68 \times 2,0 = 3,36 \text{ m}^2$

$1,97 \times 1,28 = 2,52 \text{ m}^2$

Subtotal: $(69,72 - 5,88) = 63,84 \text{ m}^2$



PREFEITURA DE LAJINHA

CIRCULAÇÃO = $(1,12+10,53+4,15+4,15+1,47+4,15+1,61+4,32+6,11+6,21) = 43,82 \times 2,90 = 127,08 \text{ m}^2$

Descontos:

$0,80 \times 2,10 = 1,68 \times 7,0 = 11,76 \text{ m}^2$

$0,94 \times 2,10 = 1,97 \text{ m}^2$

$1,97 \times 1,28 = 2,52 \times 2,0 = 5,04 \text{ m}^2$

$1,97 \times 1,18 = 2,32 \text{ m}^2$

$0,90 \times 2,10 = 1,89 \text{ m}^2$

Subtotal: $(127,08 - 22,98) = 104,10 \text{ m}^2$

REFEITÓRIO = $7,74+4,04+7,74+4,04) = 23,56 \times 2,45 = 57,72 \text{ m}^2$

Descontos:

$(0,80 \times 2,10) = 1,68 \text{ m}^2$

$0,94 \times 2,10 = 1,97 \text{ m}^2$

$1,0 \times 1,0 = 1,0 \text{ m}^2$

Subtotal: $(57,72 - 4,65) = 53,07 \text{ m}^2$

TOTAL: 228,49 m²

4.3 – PINTURA ACRÍLICA PAREDE

SALA DE AULA 1 = $(7,23+7,23+5,79+5,79) = 26,04 \times 2,90 = 75,52 \text{ m}^2$

Descontos:

$0,80 \times 2,10 = 1,68 \text{ m}^2$

$1,97 \times 1,28 = 2,52 \text{ m}^2$

Subtotal: $(75,52 - 4,20) = 71,32 \text{ m}^2$

SALA DE AULA 2 = $(6,06+6,06+5,96+5,96) = 24,04 \times 2,90 = 69,72 \text{ m}^2$

Descontos:

$0,80 \times 2,10 = 1,68 \times 2,0 = 3,36 \text{ m}^2$

$1,97 \times 1,28 = 2,52 \text{ m}^2$

Subtotal: $(69,72 - 5,88) = 63,84 \text{ m}^2$



PREFEITURA DE LAJINHA

CIRCULAÇÃO = $(1,12+10,53+4,15+4,15+1,47+4,15+1,61+4,32+6,11+6,21) = 43,82 \times 2,90 = 127,08 \text{ m}^2$

Descontos:

$$0,80 \times 2,10 = 1,68 \times 7,0 = 11,76 \text{ m}^2$$

$$0,94 \times 2,10 = 1,97 \text{ m}^2$$

$$1,97 \times 1,28 = 2,52 \times 2,0 = 5,04 \text{ m}^2$$

$$1,97 \times 1,18 = 2,32 \text{ m}^2$$

$$0,90 \times 2,10 = 1,89 \text{ m}^2$$

Subtotal: $(127,08 - 22,98) = 104,10 \text{ m}^2$

REFEITÓRIO = $7,74+4,04+7,74+4,04) = 23,56 \times 2,45 = 57,72 \text{ m}^2$

Descontos:

$$(0,80 \times 2,10) = 1,68 \text{ m}^2$$

$$0,94 \times 2,10 = 1,97 \text{ m}^2$$

$$1,0 \times 1,0 = 1,0 \text{ m}^2$$

Subtotal: $(57,72 - 4,65) = 53,07 \text{ m}^2$

FACHADA = $(7,23+11,75+4,19+8,04+4,19+7,53+20,92) = 63,85 \times 3,80 = 242,63 \text{ m}^2$

$$(1,60 \times 2,94) = 4,70 \times 2,0 = 9,41 \text{ m}^2$$

$$(2,33+24,0+4,54) = 30,87 \times 0,92 = 28,40 \text{ m}^2$$

Descontos:

$$(0,98 \times 0,50) = 0,49 \text{ m}^2$$

$$(1,97 \times 1,18) = 2,32 \text{ m}^2$$

$$(0,90 \times 2,10) = 1,89 \times 2,0 = 3,78 \text{ m}^2$$

$$(1,97 \times 1,28) = 2,52 \times 6,0 = 15,12 \text{ m}^2$$

$$(0,80 \times 2,10) = 1,68 \text{ m}^2$$

$$(1,0 \times 1,0) = 1,0 \text{ m}^2$$

$$(0,63 \times 0,54) = 0,34 \text{ m}^2$$



PREFEITURA DE LAJINHA

Subtotal: $(280,44 - 24,73) = 255,71 \text{ m}^2$

TOTAL: 484,20 m²

4.4 – SELADOR

$(1,60 \times 2,94) = 4,70 \text{ m}^2$

$(0,70 \times 0,80) = 0,56 \text{ m}^2$

TOTAL: 5,26 m²

4.5 – PINTURA ESQUADRIA DE MADEIRA

$(0,80 \times 2,10) = 1,68 \times 9,0 = 15,12 \text{ m}^2$

5.0 – SERVIÇOS COMPLEMENTARES

5.1 - ESQUADRIA DE ALUMÍNIO E VIDRO – 2 FOLHAS

$= (1,97 \times 1,28) = 2,52 \times 6,0 = 15,12 \text{ m}^2$

$(1,97 \times 1,18) = 2,32 \text{ m}^2$

$(1,0 \times 1,0) = 1,0 \text{ m}^2$

TOTAL: 18,44 m²

5.2 – ESQUADRIA DE ALUMÍNIO E VIDRO – BASCULANTE

$= (0,63 \times 0,54) = 0,34 \times 3,0 = 1,02 \text{ m}^2$

5.3 – REVESTIMENTO DE GRANITO

$= (5,21 \times 0,30) = 1,56 \text{ m}^2$

$= (5,21 \times 0,50) = 2,61 \text{ m}^2$

TOTAL: $1,56 + 2,61 = 4,17 \text{ m}^2$

5.4 - ESQUADRIA DE MADEIRA

$= 09 \text{ unidades}$

5.5 – PORTÃO DE FERRO

$= 0,90 \times 2,10 = 1,89 \text{ m}^2$

5.6 – ALAMBRADO

$= (30,0 + 20,0 + 5,72 + 17,38) = 73,10 \text{ m}$



PREFEITURA DE LAJINHA

5.7– GRADE

$$= (4,61+24,07+2,40) = 31,08 \times 2,0 = 62,16 \text{ m}^2$$

5.8– LIMPEZA FINAL

$$= 191,21 \text{ m}^2$$

Lajinha/MG, 10 de agosto de 2020.

Thaís Boechat de Lima
Engenheira Civil CREA MG 212.895/D