

MEMÓRIA DE CÁLCULO

OBRA: CONSTRUÇÃO DE UMA UNIDADE DE “CASA LAR”

LOCAL: Rua Zélia de Souza Portes – Bairro Cidade Nova - Divino – MG

01 – SERVIÇOS PRELIMINARES

01.01– PLACA DE OBRA → 1,00 und

01.03 – LOCAÇÃO DE OBRA → 203,75 m²

2.0 – MOVIMENTO DE TERRA

02.01 – ESCAVAÇÃO MANUAL

SAPATAS_{1,00m x 1,00m} → (1,00m_{Lado} x 1,00m_{Lado} x 1,20m_{Prof}) x 25und = 30,00m³

BALDRAME → [(28,00m + 7,00m + 22,35m + 5,65m + 5,15m + 7,00m + 3,65m + 22,00m + 19,70m + 15,05m + 17,50m + 7,00m) x (0,15m_{Larg} x 0,30m_{Prof}) = (160,05m x 0,045) = 7,20m³

TOTAL → 30,00m³ + 7,20m³ = **37,20m³**

02.03 – REATERRO MANUAL → 37,20m³_{Escav Total} – 15,71m³_{Vol. concreto} = **21,49m³**

3.0 – INFRA-ESTRUTURA

03.01 – LASTRO DE CONCRETO MAGRO → 1,00m x 1,00m x 0,08 x 25Und. = **2,00m³**

03.02 – AQUISIÇÃO, CORTE, DOBRA E ARMAÇÃO DE AÇO CA50/60

AÇO CA 60

ARRANQUE DOS PILARES → (0,90m : 0,15)Quantidade x (0,27m + 0,12m + 0,27m + 0,12m)Comp.

Total x 0,154Coef. X 25Und. = 18,01kg

BALDRAME → (160,05m : 0,15)Quantidade x (0,27m + 0,12m + 0,27m + 0,12m)Comp. Total X 0,154Coef. = 128,16kg

TOTAL → 18,01Kg + 128,16Kg = **146,17kg**

AÇO CA 50

SAPATAS $\rightarrow \{[(1,00\text{m} : 0,10)\text{Quantidade} \times 1,00\text{Comp. Total}]\text{Direção x} + \{(1,00\text{m} : 0,10)\text{Quantidade} \times 1,00\text{Comp. Total}\}\text{Direção y} \} \times 25\text{Und.} \times 0,624\text{Coef.} = 312,00\text{kg}$

ARRANQUE DOS PILARES $\rightarrow (1,00\text{m} \times 4\text{N}^\circ \text{ barras})\text{Quantidade} \times 25\text{Und.} \times 0,624\text{Coef.} = 52,42\text{kg}$

BALDRAME $\rightarrow (160,05\text{m} \times 4\text{N}^\circ \text{ barras})\text{Quantidade} \times 0,624\text{Coef.} = 131,54\text{kg}$

Total $\rightarrow 251,60\text{Kg} + 52,42\text{Kg} + 131,54\text{Kg} = \mathbf{435,56\text{kg}}$

TOTAL ITEM $\rightarrow 146,17\text{Kg} + 435,56\text{Kg} = \mathbf{581,73\text{kg}}$

03.02 – CONCRETO FCK 20 MPA

SAPATAS $_{1,00\text{m} \times 1,00\text{m}} \rightarrow (1,00\text{m} \times 1,00\text{m}) \times 0,30\text{m} \times 25\text{Und.} = 7,50\text{m}^3$

ARRANQUE DOS PILARES $\rightarrow (0,30\text{m} \times 0,15\text{m}) \times 0,90\text{m Alt.} \times 25\text{Und.} = 1,01\text{m}^3$

BALDRAME $\rightarrow (160,05\text{m} \times 0,15\text{m} \times 0,30\text{m}) = 7,20\text{m}^3$

TOTAL $\rightarrow 7,50\text{m}^3 + 1,01\text{m}^3 + 7,20\text{m}^3 = \mathbf{15,71\text{m}^3}$

03.01 – FORMA

ARRANQUE DOS PILARES $\rightarrow (0,30\text{m} + 0,15\text{m} + 0,30\text{m} + 0,15\text{m})_{\text{Lados}} \times 0,90\text{m}_{\text{Alt.}} \times 25\text{Und.} = \mathbf{20,25\text{m}^2}$

VIGA BALDRAME $\rightarrow (0,30\text{m} + 0,30\text{m})_{\text{Lados}} \times 160,05\text{m}_{\text{Comp.}} = \mathbf{96,03\text{m}^2}$

TOTAL $= \mathbf{116,28\text{m}^2}$

4.0 – SUPER-ESTRUTURA

04.01 – AQUISIÇÃO, CORTE, DOBRA E ARMAÇÃO DE AÇO CA50/60

AÇO CA 50

PILARES $= (2,80\text{m} \times 4\text{N}^\circ \text{ barras})\text{Quantidade} \times 25\text{Und.} \times 0,624\text{Coef.} = 174,72\text{kg}$

VIGAS $= (160,05\text{m} \times 4\text{N}^\circ \text{ barras})\text{Quantidade} \times 0,624\text{Coef.} = 399,48\text{kg}$

LAJES $\rightarrow \{[(3,50\text{m} : 0,15) \text{ Quant.} \times 3,85\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,85\text{m} : 0,15) \text{ Quant.} \times 3,50\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. x}} + \{[(3,50\text{m} : 0,15) \text{ Quant.} \times 3,00\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,00\text{m} : 0,15) \text{ Quant.} \times 3,50\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. x}} + \{[(4,00\text{m} : 0,15) \text{ Quant.} \times 3,85\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,85\text{m} : 0,15) \text{ Quant.} \times 4,00\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. x}} + \{[(3,00\text{m} : 0,15) \text{ Quant.} \times 4,00\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(4,00\text{m} : 0,15) \text{ Quant.} \times 3,00\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. x}} + \{[(3,15\text{m} : 0,15) \text{ Quant.} \times 3,85\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,85\text{m} : 0,15) \text{ Quant.} \times 3,15\text{m}]\text{Comp. Total} \times 0,248\text{Coef.}\}_{\text{dir. x}}$

$0,248\text{Coef.}\}_{\text{dir.x}} + \{[(3,15\text{m} : 0,15) \text{ Quant. X } 3,00\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,00\text{m} : 0,15) \text{ Quant. X } 3,15\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir.x}} + \{[(3,15\text{m} : 0,15) \text{ Quant. X } 3,85\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,85\text{m} : 0,15) \text{ Quant. X } 3,15\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir.x}} + \{[(3,15\text{m} : 0,15) \text{ Quant. X } 3,00\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,00\text{m} : 0,15) \text{ Quant. X } 3,15\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir.x}} + \{[(4,00\text{m} : 0,15) \text{ Quant. X } 3,85\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,85\text{m} : 0,15) \text{ Quant. X } 4,00\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir.x}} + \{[(3,50\text{m} : 0,15) \text{ Quant. X } 3,85\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,85\text{m} : 0,15) \text{ Quant. X } 3,50\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir.x}} + \{[(5,50\text{m} : 0,15) \text{ Quant. X } 3,85\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(3,85\text{m} : 0,15) \text{ Quant. X } 5,50\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir.x}} + \{[(3,00\text{m} : 0,15) \text{ Quant. X } 5,50\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir. y}} + \{[(5,50\text{m} : 0,15) \text{ Quant. X } 3,00\text{m}]\text{Comp. Total X } 0,248\text{Coef.}\}_{\text{dir.x}} + \{[(26,80\text{m} : 0,20) \text{ Quant. X } 2,50\text{m}]\text{Comp. Total X } 0,624\text{Coef.}\} + \{[(41,40\text{m} : 0,20) \text{ Quant. X } 2,50\text{m}]\text{Comp. Total X } 0,624\text{Coef.}\} = 1064,54\text{kg}$
TOTAL → 174,72kg + 399,48kgb + 1064,54 = **1638,74kg**

AÇO CA 60

PILARES → $(2,80\text{m} : 0,15)\text{Quantidade X } (0,27\text{m} + 0,12\text{m} + 0,27\text{m} + 0,12\text{m})\text{Comp. Total X } 0,154\text{Coef. X } 25\text{Und.} = 56,06\text{kg}$

VIGAS → $(160,05\text{m} : 0,15)\text{Quantidade X } (0,27\text{m} + 0,12\text{m} + 0,27\text{m} + 0,12\text{m})\text{Comp. Total X } 0,154\text{Coef.} = 128,16\text{kg}$

PLATIBANDA → $(1,00\text{m} : 0,15)\text{Quantidade X } (0,27\text{m} + 0,12\text{m} + 0,27\text{m} + 0,12\text{m})\text{Comp. Total X } 0,154\text{Coef. X } 19\text{Und.} = 15,21\text{kg}$

TOTAL → 56,06kg + 128,16kg + 15,21kg = **199,43kg**

TOTAL ITEM → 1638,74Kg + 199,43Kg = **1.838,17kg**

04.02 – FORMA

PILARES → $(0,30\text{m} + 0,30\text{m})_{\text{Lados X } 2,80\text{mAlt.}} \text{ X } 25\text{Und.} = 23,52\text{m}^2$

VIGAS → $(160,05\text{m} \times 0,30\text{m}) \times 2_{\text{Lados}} = 34,02\text{m}^2$

LAJE → $203,75\text{m}^2$

PLATIBANDA → $(0,30\text{m} + 0,30\text{m})_{\text{Lados X } 1,00\text{mAlt.}} \text{ X } 19\text{Und.} = 11,40\text{m}^2$

TOTAL → $23,52\text{m}^2 + 34,02\text{m}^2 + 203,75\text{m}^2 + 11,40\text{m}^2 = \mathbf{272,69\text{m}^2}$

04.03 – CONCRETO FCK 20 MPA

PILARES → $(0,30\text{mLado} \times 0,15\text{mLado} \times 2,80\text{mAlt.}) \text{ X } 25\text{Und.} = 1,76\text{m}^3$

VIGAS → $160,05\text{m} \times (0,30\text{m} \times 0,15\text{m}) = 2,55\text{m}^3$

$$\text{LAJES} \rightarrow (203,75\text{m}^2 \times 0,10\text{m}) = 20,37\text{m}^3$$

$$\text{PILARES} \rightarrow (0,30\text{m}_{\text{Lado}} \times 0,15\text{m}_{\text{Lado}} \times 1,00\text{m}_{\text{Alt.}}) \times 19_{\text{Und.}} = 0,86\text{m}^3$$

$$\text{TOTAL} \rightarrow 1,76\text{m}^3 + 2,55\text{m}^3 + 20,37\text{m}^3 + 0,86\text{m}^3 = \mathbf{25,54\text{m}^3}$$

5.0 – PAREDES E PAINÉIS

05.01 – ALVENARIA DE BLOCO CERÂMICO

$$\text{SALA ADM./REUNIÃO} \rightarrow \{(23,60\text{m} \times 2,80\text{m}) - [(1,50\text{m} \times 2,10\text{m}) + (4,50\text{m} \times 1,10\text{m})]\} = 57,98\text{m}^2$$

$$\text{SALA ESTAR/JANTAR} \rightarrow \{(20,30\text{m} \times 2,80\text{m}) - [(0,90\text{m} \times 2,10\text{m}) + (3,00\text{m} \times 1,10\text{m})]\} = 51,65\text{m}^2$$

$$\text{QUARTO} \rightarrow \{(7,65\text{m} \times 2,80\text{m}) - (0,80 \times 2,10\text{m})\} = 18,90\text{m}^2$$

$$\text{QUARTO} \rightarrow (10,65\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 2,10\text{m}) + (1,50\text{m} \times 1,10\text{m})] = 26,49\text{m}^2$$

$$\text{COZINHA} \rightarrow (9,90\text{m} \times 2,80\text{m}) - [(1,20\text{m} \times 2,10\text{m}) + (1,50\text{m} \times 1,10\text{m})] = 23,55\text{m}^2$$

$$\text{ÁREA SERVIÇO} \rightarrow (3,15\text{m} \times 2,80\text{m}) - (2,00\text{m} \times 2,10\text{m}) = 4,62\text{m}^2$$

$$\text{DEPÓSITO} \rightarrow (9,85\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 0,60\text{m} \times 2_{\text{und}}) + (0,80\text{m} \times 2,10\text{m})] = 24,94\text{m}^2$$

$$\text{BANHO} \rightarrow (5,85\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 0,60\text{m}) + (0,70\text{m} \times 2,10\text{m})] = 14,43\text{m}^2$$

$$\text{QUARTO} \rightarrow (12,50\text{m} \times 2,80\text{m}) - [(1,50\text{m} \times 1,10\text{m}) + (0,80\text{m} \times 2,10\text{m})] = 31,67\text{m}^2$$

$$\text{QUARTO} \rightarrow (8,55\text{m} \times 2,80\text{m}) - [(1,50\text{m} \times 1,10\text{m}) + (0,80\text{m} \times 2,10\text{m})] = 20,61\text{m}^2$$

$$\text{QUARTO} \rightarrow (13,30\text{m} \times 2,80\text{m}) - [(1,50\text{m} \times 1,10\text{m}) + (0,80\text{m} \times 2,10\text{m})] = 33,91\text{m}^2$$

$$\text{BANHOS} \rightarrow (25,15\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 0,60\text{m} \times 4_{\text{und}}) + (0,80\text{m} \times 2,10\text{m} \times 2_{\text{und}})] = 65,14\text{m}^2$$

$$\text{RESERVATÓRIO} \rightarrow 10,90\text{m} \times 2,00\text{m} = 21,80\text{m}^2$$

$$\text{PLATIBANDA} \rightarrow 77,20\text{m} \times 1,00\text{m} = 77,20\text{m}^2$$

$$\text{TOTAL} = \mathbf{477,89\text{m}^2}$$

05.02 – VERGA/CONTRAGERGA

$$\text{PORTAS} \rightarrow [(1,20\text{m} + 0,20\text{m} + 0,20\text{m}) \times 3_{\text{und}}] + [(0,80\text{m} + 0,20\text{m} + 0,20\text{m}) \times 10_{\text{und}}] + [(0,70\text{m} + 0,20\text{m} + 0,20\text{m}) \times 1_{\text{und}}] + [(2,00\text{m} + 0,20\text{m} + 0,20\text{m}) \times 1_{\text{und}}] = 20,30\text{m}$$

$$\text{JANELA/BÁSCULA} \rightarrow [(0,80\text{m} + 0,20\text{m} + 0,20\text{m}) \times 7_{\text{und}}] + [(1,50\text{m} + 0,20\text{m} + 0,20\text{m}) \times 3_{\text{und}}] = 14,10\text{m}$$

$$\text{TOTAL} = 34,40\text{m} \times 0,1 \times 0,1 = \mathbf{0,35\text{m}^3}$$

6.0 – IMPERMEABILIZAÇÃO

$$\text{06.01 – BALDRAMES} \rightarrow (160,05\text{m}_{\text{Compr Baldrame}} \times 0,60\text{m}_{\text{Altura}}) \times 02_{\text{Lados}} = 192,06 \text{ m}^2$$

7.0 – REVESTIMENTO DE PAREDE

07.01 – CHAPISCO → $477,89\text{m}^2 \times 2\text{ lados} = 955,78\text{m}^2$

TOTAL = 955,78m²

07.02 – REBOCO → $(955,78\text{m}^2_{\text{Chapisco}} - 135,84\text{m}^2_{\text{Emboço}}) = \mathbf{819,94\text{m}^2}$

07.03 – EMBOÇO

COZINHA → $\{12,30\text{m} \times 2,80\text{m} - [(0,80\text{m} \times 2,10\text{m}) + (1,50\text{m} \times 1,10\text{m}) + (1,20\text{m} \times 2,10)]\} = 28,59\text{m}^2$

ÁREA DE SERVIÇO → $\{9,45\text{m} \times 2,80\text{m} - [(0,80\text{m} \times 2,10\text{m} \times 2\text{und}) + (1,50\text{m} \times 1,10\text{m}) + (2,00\text{m} \times 2,10\text{m})]\} = 17,25\text{m}^2$

DML → $(9,70\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 0,60\text{m} \times 2\text{und}) + (0,80\text{m} \times 2,10\text{m})] = 24,52\text{m}^2$

BANHEIRO 01 → $(7,70\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 2,10\text{m}) + (0,80\text{m} \times 0,60\text{m})] = 19,40\text{m}^2$

BANHEIRO 02 → $(9,00\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 2,10\text{m}) + (0,80\text{m} \times 0,60\text{m})] = 23,04\text{m}^2$

BANHEIRO 03 → $(9,00\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 2,10\text{m}) + (0,80\text{m} \times 0,60\text{m})] = 23,04\text{m}^2$

TOTAL = 135,84m²

07.04 – REVESTIMENTO PAREDE

COZINHA → $\{12,30\text{m} \times 2,80\text{m} - [(0,80\text{m} \times 2,10\text{m}) + (1,50\text{m} \times 1,10\text{m}) + (1,20\text{m} \times 2,10)]\} = 28,59\text{m}^2$

ÁREA DE SERVIÇO → $\{9,45\text{m} \times 2,80\text{m} - [(0,80\text{m} \times 2,10\text{m} \times 2\text{und}) + (1,50\text{m} \times 1,10\text{m}) + (2,00\text{m} \times 2,10\text{m})]\} = 17,25\text{m}^2$

DML → $(9,70\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 0,60\text{m} \times 2\text{und}) + (0,80\text{m} \times 2,10\text{m})] = 24,52\text{m}^2$

BANHEIRO 01 → $(7,70\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 2,10\text{m}) + (0,80\text{m} \times 0,60\text{m})] = 19,40\text{m}^2$

BANHEIRO 02 → $(9,00\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 2,10\text{m}) + (0,80\text{m} \times 0,60\text{m})] = 23,04\text{m}^2$

BANHEIRO 03 → $(9,00\text{m} \times 2,80\text{m}) - [(0,80\text{m} \times 2,10\text{m}) + (0,80\text{m} \times 0,60\text{m})] = 23,04\text{m}^2$

TOTAL = 135,84m²

07.05 – PEITORIL → $(1,50\text{m} \times 10\text{und}) + (0,80\text{m} \times 06\text{und}) + 88,30\text{m}_{\text{platibanda}} = 108,10\text{m} \times 0,15$

TOTAL = 16,21m²

8.0 – REVESTIMENTO DE PISO

08.01 – CONTRAPISO

QUARTO CUIDADOR → 11,85m²

QUARTO 01 → 15,09m²

QUARTO 02 → 10,00m²

BANHO 01 → 3,70m²

DEPOSITO/DML → 4,46m²

BANHO 02 → 4,16m²

BANHO 03 → 4,16m²

QUARTO 03 → 10,00m²

QUARTO 04 → 15,09m²

SALA ADM/REUNIÃO → 24,77m²

SALA ESTAR/JANTAR → 22,95m²

COZINHA → 9,45m²

ÁREA DE SERVIÇO → 9,92m²

CIRCULAÇÃO → 17,81m²

HALL DE ENTRADA → 9,79m²

TOTAL = 173,20m²

08.02 – REVESTIMENTO CERÂMICO

QUARTO CUIDADOR → 11,85m²

QUARTO 01 → 15,09m²

QUARTO 02 → 10,00m²

BANHO 01 → 3,70m²

DEPOSITO/DML → 4,46m²

BANHO 02 → 4,16m²

BANHO 03 → 4,16m²

QUARTO 03 → 10,00m²

QUARTO 04 → 15,09m²

SALA ADM/REUNIÃO → 24,77m²

SALA ESTAR/JANTAR → 22,95m²

COZINHA → 9,45m²

ÁREA DE SERVIÇO → 9,92m²

CIRCULAÇÃO → 17,81m²

HALL DE ENTRADA → 9,79m²

TOTAL = 173,20m²

08.03 – RODAPÉ → 19,80m + 19,20m + 16,60m + 12,20m + 12,20m + 16,60m + 14,10m + 4,46m = **115,16m**

08.06 – SOLEIRA → 7,10m x 0,15 = **1,06m²**

9.0 – ESQUADRIAS DE MADEIRA

09.01 – KIT PORTA 80CM → 7und

09.02 – KIT PORTA 90CM → 1und

09.03 – KIT PORTA ESPECIAL 90CM → 3und

10.0 – ESQUADRIAS METÁLICAS

10.01 – JANELA ALUMINIO → 16,50m²

10.02 – JANELA MAXIM-AR → 3,36m²

10.02 – PORTA DE CORRER → 7,35m²

10.02 – PORTÃO → 3,15m²

11.0 – INSTALAÇÕES HIDRÁULICAS

11.01 – PONTO DE ÁGUA FRIA → 16pts

11.02 – PONTO DE ESGOTO 40MM → 9pts

11.03 – PONTO DE ESGOTO 50MM → 4pts

11.04 – PONTO DE ESGOTO 100MM → 3pts

11.05 – CUBA DE LOUÇA DE EMBUTIR → 3UND

11.06 – LAVATORIO → 3UND

11.07 – VASO SANITARIO → 1UND

11.08 – VASO SANITARIO → 2UND

11.09 – TORNEIRA PARA LAVATORIO → 3UND

11.10 – TORNEIRA PARA TANQUE → 2UND

11.11 – TORNEIRA PARA PIA → 1UND

11.12 – TANQUE → 1UND

11.13 – CUBA → 1UND

11.14 – BANCADA EM GRANITO → 1,74m²

11.15 – FURO BANCADA → 1UND

11.16 – CAIXA SIFONADA → 5UND

11.17 – CAIXA ALVENARIA → 2UND

11.18 – CAIXA DÁGUA 1000L → 1UND

11.19 – PAPELEIRA → 3UND

11.20 – SABONETEIRA → 3UND

11.21 – DISPENSER PAPEL TOALHA → 5UND

11.22 – DISPENSER ALCOOL EM GEL → 5UND

12.0 – INSTALAÇÕES ELÉTRICAS

12.01 – QUADRO DE DISTRIBUIÇÃO → 1und

12.02 – MINI DIJUNTOR 20A → 16und

12.03 – PONTO INTERRUPTOR COMPLETO → 20und

12.04 – PONTO EMBUTIR LUMINARIA → 20und

12.05 – PONTO TOMADA 2P+T → 30und

12.06 – LUMINÁRIA PLAFON → 20und

13.0 – PINTURA INTERNA E EXTERNA

13.01 – SELADOR PAREDE → 819,94m²

13.01 – PINTURA PAREDE → 819,94m²

13.01 – SELADOR TETO → 173,20m²

13.01 – PINTURA TETO → 173,20m²

14.0 – PINTURA EM ESQUADRIAS

14.01 – PINTURA ESQUADRIAS → 3,15m² x 3lados = 9,45m²

14.02 – PINTURA MADEIRA → $[(0,80m \times 2,10m \times 7und) + (0,90m \times 2,10m \times 3und)] \times 3lados = 52,29m^2$

15.0 – ACESSORIOS DIVERSOS

15.01 – BARRA DE APOIO LAVATORIO → 4UND

15.02 – BARRA DE APOIO PAREDE → 4UND

15.03 – BARRA DE APOIO VASO SANITARIO → 4UND

15.04 – BEBEDOURO → 1UND

16.0 – COBERTURA E REDE PLUVIAL

16.01 – ESTRUTURA DE AÇO PARA COBERTURA → 216,33m²

16.02 – COBERTURA → 216,33m²

16.03 – CALHA → 29,40M

16.04 – CONDUTOR DE AGUA PLUVIAL 75MM → 28M

16.05 – REDE PLUVIAL 150MM → 20M

16.06 – FORRO DE GESSO → 173,20M²

17.0 – SERVIÇOS COMPLEMENTARES

17.01 – LIMPEZA GERAL → 203,75m²

Ana Paula Rizzi Oliveira

Eng^a. Civil

CREA MG 161.303/D