

* ESTRUTURA DE MADEIRA

(1)

- TERÇAS, BANZOS, MONTANTES, DIAGONAIS: $4,5 \times 10$
- PONTALETES; BERÇOS: $4,5 \times 14$
- CAIBROS: $4,5 \times 4,5$

→ LEVANTAMENTOS: \rightarrow TERÇA (SOLÁRIO): $6 \times 7,35 = 44,10 \text{ m}$

1) TERÇAS: $(3 \times 10,80) + (4 \times 20,80) + (4 \times 30,80) + (3 \times 42,20) + (5 \times 43,0)$
 $+ 13,13 + (6 \times 14,85) + (7 \times 12,35) + 11,10 + (15 \times 63,45) + 32,35 =$
 $1.694,28 \text{ m} + 44,10 = 1.738,38$

2) TEBOURAS: \rightarrow CAIBROS: $(3 \times 10,80) + (4 \times 20,80) + (8 \times 30,80) + (6 \times 42,20) = 615,20 \text{ m}$

MONTANTE ($4,5 \times 10$): $13,20 \text{ m}$.
 PONTALETES ($4,5 \times 14$): $(0,35 + 0,46 + 0,56 + 0,66 + 0,73 + 0,83 + 0,93 + 1,03 + 1,11 + 1,21 + 1,31 + 1,41 + 1,53 + 1,64) = 13,76 \text{ m}$.
 $14 \times 0,40 = 5,60 \text{ m}$.

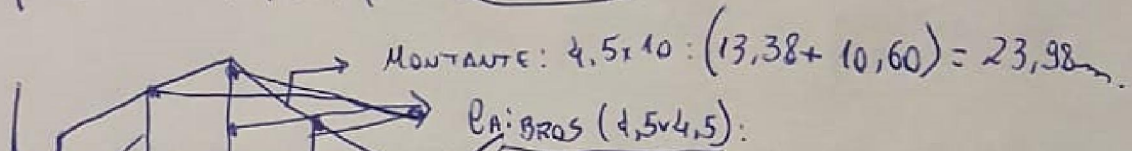
$\therefore T1$: $4,5 \times 4,5 = 615,20 \text{ m}$
 $\times 5$ $4,5 \times 10 = 13,20 \text{ m}$ $\times 5 = 66,00 \text{ m}$ \rightarrow CORRÍDO
 $4,5 \times 14 = 13,76 + 5,60 = 19,36 \text{ m} \times 5 = 96,80 \text{ m}$

$T2$ $\times 1$
 \rightarrow CORRÍDO.
 CAIBROS ($4,5 \times 4,5$): $(10 \times 42,98) + (9 \times 12,35) = 540,95 \text{ m}$.
 MONTANTE ($4,5 \times 10$): $10,51 \text{ m}$.
 PONTALETE ($4,5 \times 14$): $(0,62 + 0,68 + 0,74 + 0,84 + 0,94 + 1,04 + 1,14$

$$\therefore T_2: \begin{cases} 4,5 \times 4,5: 540,95 \text{ m.} \\ 4,5 \times 10: 10,51 \text{ m.} \\ 4,5 \times 14: 13,20 + 4,80 = 18,00 \text{ m.} \end{cases}$$

13

2x



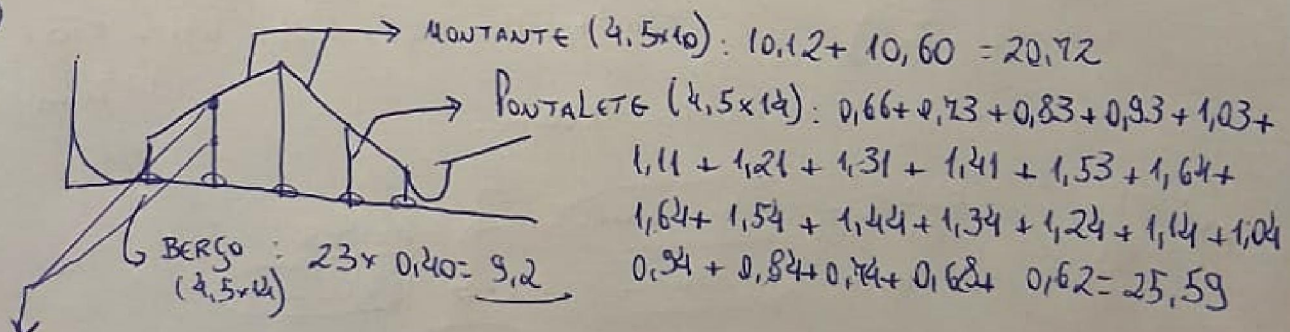
$$\begin{aligned} & \text{PONTALETE: } 4,5 \times 14: 10,35 + 0,46 + 0,56 + 0,66 + 0,73 + 0,83 + 0,93 + \\ & 1,03 + 1,11 + 1,21 + 1,31 + 1,41 + 1,53 + 1,64 + 1,64 \\ & 1,54 + 1,44 + 1,34 + 1,24 + 1,14 + 1,04 + 0,94 + 0,84 \\ & 0,74 + 0,68 + 0,62: 26,96 \text{ m.} \\ & 26 \times 0,40 = 10,40. \end{aligned}$$

$$\begin{aligned} \text{CABROS } (4,5 \times 4,5): & (10,80 \times 3) + (4 \times 20,80) + (8 \times 30,80) + (6 \times 42,20) + (10 \times 42,98) + \\ & + (9 \times 12,35) = 1.156,15 \end{aligned}$$

$$\therefore T_3: \begin{cases} 4,5 \times 4,5 = 1.156,15 \text{ m} \\ 4,5 \times 10 = 23,98 \times 2 = 47,96 \text{ m.} \\ 4,5 \times 14 = (26,96 + 10,40) \times 2 = 74,72 \text{ m.} \end{cases}$$

14

5x

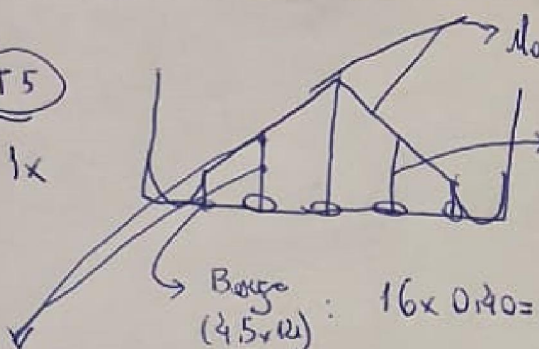


$$\begin{aligned} \text{CABROS } (4,5 \times 4,5): & (4 \times 20,80) + (8 \times 30,80) + (6 \times 42,20) + (10 \times 42,98) + (9 \times 12,35) = \\ & 1.123,75 \end{aligned}$$

$$\therefore T_4: \begin{cases} 4,5 \times 4,5 = 1.123,75 \text{ m} \\ 4,5 \times 10 = 20,72 \times 5 = 103,60 \text{ m} \\ 4,5 \times 14 = (25,59 + 9,20) \times 5 = 173,95 \text{ m} \end{cases}$$

T5

1x



MONTANTE (4,5x10): $10,12 + 4,31 = 14,43$ (2)

PONTALETE: $0,66 + 0,73 + 0,83 + 0,93 + 1,03 + 1,11 + 1,21 + 1,31 + 1,41 + 1,53 + 1,64 + 1,64 + 1,54 + 1,44 + 1,34 + 1,24 = 19,59$

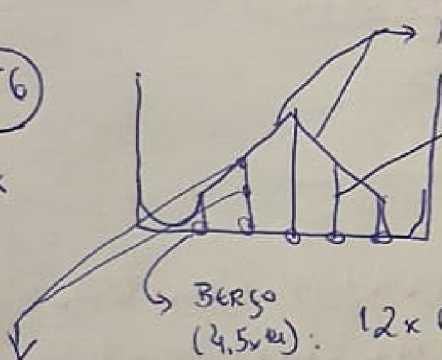
BERGO (4,5x12): $16 \times 0,40 = 6,4$

CAIBROS (4,5x4,5): $(4 \times 20,80) + (8 \times 30,80) + (6 \times 42,20) + (10 \times 42,98) = 1012,60$

\therefore T5: $\left\{ \begin{array}{l} 4,5 \times 4,5 = 1.012,60 \text{ m} \\ 4,5 \times 10 = 14,43 \text{ m} \\ 4,5 \times 14 = 19,59 + 6,40 = 25,99 \text{ m} \end{array} \right.$

T6

6x



MONTANTE (4,5x10): $6,35 + 4,31 = 10,66$

PONTALETE: $1,04 + 1,11 + 1,21 + 1,31 + 1,41 + 1,53 + 1,64 + 1,64 + 1,54 + 1,44 + 1,34 + 1,24 = 16,45$

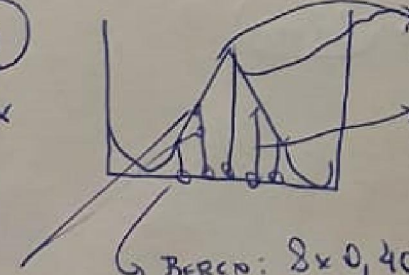
BERGO (4,5x12): $12 \times 0,40 = 4,8$

CAIBROS (4,5x4,5): $(8 \times 30,80) + (6 \times 42,20) + (10 \times 42,98) = 929,40$

\therefore T6: $\left\{ \begin{array}{l} 4,5 \times 4,5 = 929,40 \text{ m} \\ 4,5 \times 10 = 10,66 \times 6 = 63,96 \text{ m} \\ 4,5 \times 14 = 4,8 + 16,45 = 21,25 \times 6 = 127,50 \text{ m} \end{array} \right.$

T7

3x



MONTANTE: $2,58 + 4,31 = 6,89 \text{ m}$

PONTALETES: $1,41 + 1,53 + 1,64 + 1,64 + 1,54 + 1,44 + 1,34 + 1,24 = 11,78 \text{ m}$

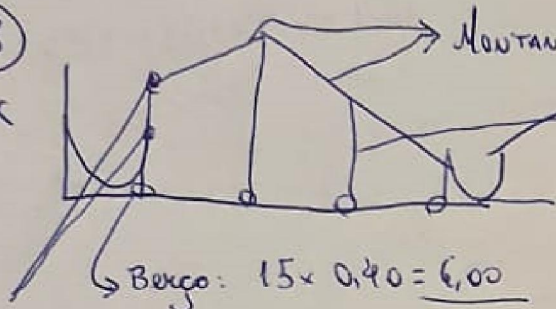
BERGO: $8 \times 0,40 = 3,2$

CAIBROS: $(6 \times 42,20) + (10 \times 42,98) = 683 \text{ m}$

$$\therefore T7: \begin{cases} 4,5 \times 4,5: (683, m) \\ 4,5 \times 10: 6,98 \times 3 = (20,94 m) \\ 4,5 \times 14: (11,78 + 3,20) \times 3 = (44,94 m) \end{cases}$$

T8

3x



MONTANTE: $(2,58 + 10,60) = 13,18$

PONTALETE: $1,24 + 1,53 + 1,64 + 1,64 + 1,54 + 1,44 + 1,34 + 1,24 + 1,14 + 1,04 + 0,94 + 0,84 + 0,74 + 0,68 + 0,62 =$

Berge: $15 \times 0,40 = 6,00$

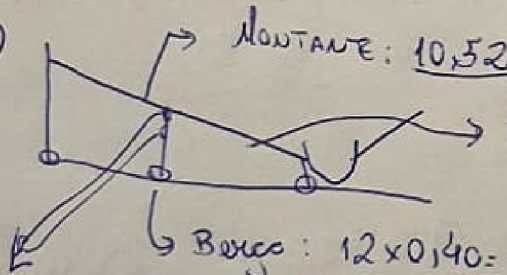
Paibros: $(6 \times 42,20) + (10 \times 42,98) + (2 \times 13,13) + (7 \times 14,85) = 813,21$

$$\therefore T8 \begin{cases} 4,5 \times 4,5 = (842,91 m) \\ 4,5 \times 10 = 13,18 \times 3 = (39,54 m) \\ 4,5 \times 14 = (6 + 17,98) \times 3 = (71,34 m) \end{cases}$$

813,21

T9

4x



MONTANTE: $10,52$

PONTALETE: $1,64 + 1,54 + 1,44 + 1,34 + 1,24 + 1,14 + 1,04 + 0,94 + 0,84 + 0,74 + 0,68 + 0,62 = 13,2$

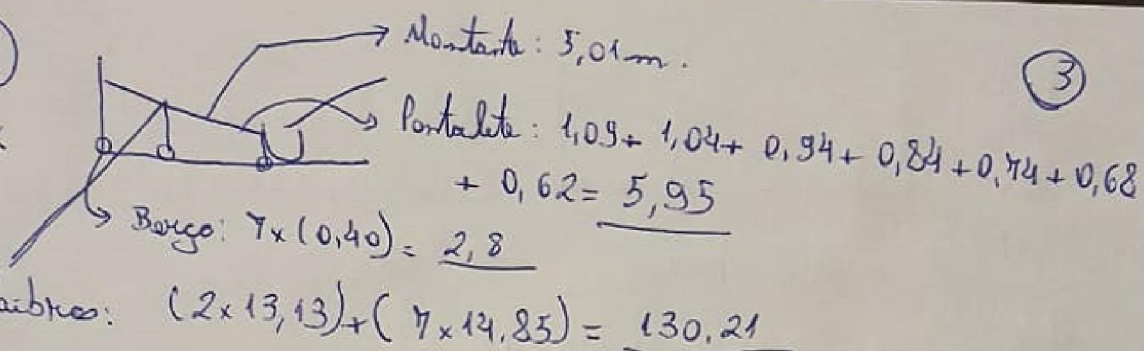
Berge: $12 \times 0,40 = 4,8$

Paibros: $(10 \times 42,98) + (2 \times 13,13) + (7 \times 14,85) = 560,01$

$$\therefore T9: \begin{cases} 4,5 \times 4,5: (560,01 m) \\ 4,5 \times 10: 10,52 \times 4 = (42,08 m) \\ 4,5 \times 14: (4,8 + 13,2) \times 4 = (72 m) \end{cases}$$

T10

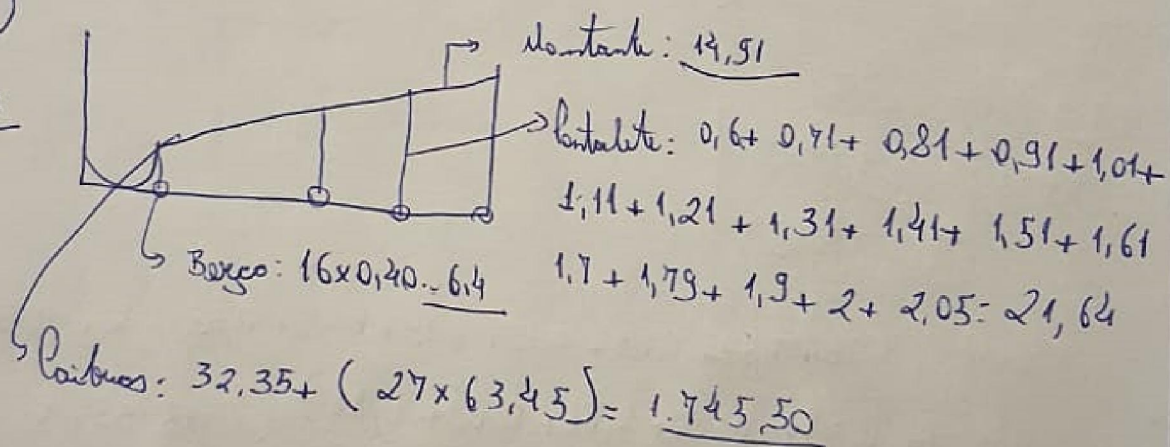
3x



$$\therefore T10 \quad \left\{ \begin{array}{l} 4,5 \times 4,5 = 130,21 \text{ m} \\ 4,5 \times 10 = 5,01 \text{ m} \\ 4,5 \times 14 = 5,95 + 2,80 = 8,75 \text{ m} \end{array} \right.$$

T11

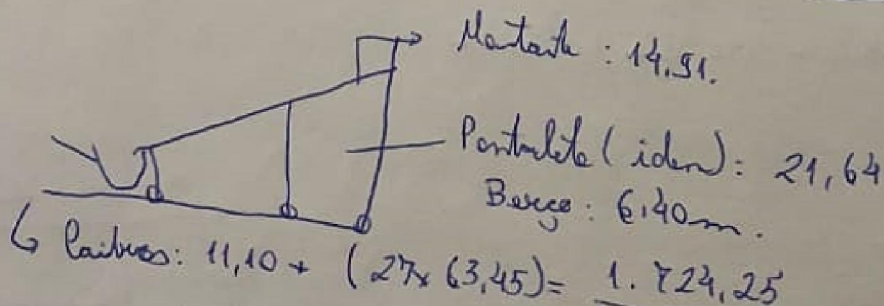
11x



$$\therefore T11 \quad \left\{ \begin{array}{l} 4,5 \times 4,5 = 1.745,50 \text{ m} \\ 4,5 \times 10 = 14,91 \times 11 = 164,01 \text{ m} \\ 4,5 \times 14 = (21,64 + 6,4) \times 11 = 308,44 \text{ m} \end{array} \right.$$

T11

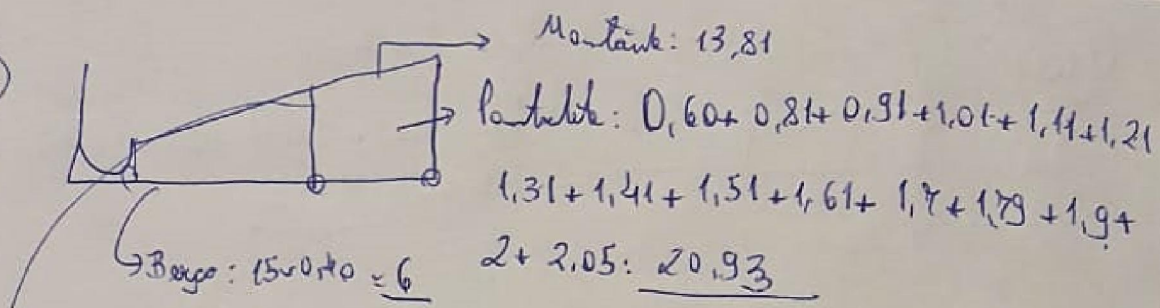
15x



$$\therefore T11 \quad \left\{ \begin{array}{l} 4,5 \times 4,5 = 1.724,25 \text{ m} \\ 4,5 \times 10 = 14,91 \times 15 = 223,65 \text{ m} \\ 4,5 \times 14 = (21,64 + 6,4) \times 15 = 420,60 \text{ m} \end{array} \right.$$

T12

10x

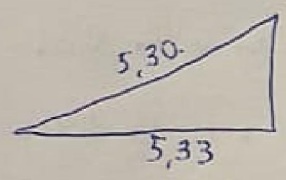


Padrões: $(27 \times 63,45) = 1.713,15$

$\begin{matrix} \text{T12} \\ \text{10x} \end{matrix} \left\{ \begin{array}{l} 4,5 \times 4,5: 1.713,15 \text{ m} \\ 4,5 \times 10: 13,81 \times 10 = 138,10 \text{ m} \\ 4,5 \times 14: (20,93 + 6) \times 10 = 269,30 \text{ m} \end{array} \right.$

T5

5x



$4,5 \times 10: 5,30 + 5,33 + 0,08 + 0,15 + 0,19 + 0,26 + 0,33 + 0,40 + 0,49 + 0,26 + 0,38 + 0,45 + 0,66 + 0,69 + 0,96$
 : 15,95 x 5
 = 79,75 m

TOTALIZAÇÃO

4,5 x 4,5:	615,20 +	540,95 +	1.156,15 +	...
4,5 x 10:				
4,5 x 14:				

→
Próximo.

TOTALIZAÇÃO

(4)

$$1) 4,5 \times 4,5: 615,20 + 540,95 + 1.156,15 + 1.123,75 + 1.012,60 + 929,40 + 683 + 813,21 + 560,01 + 130,21 + 1.745,50 + 1.724,25 + 1.713,15 = 12.747,38 \times 1,10 = 14.022,00$$

$$2) 4,5 \times 10: \overset{\text{Telhas}}{1.738,38} + 66 + 10,51 + 47,96 + 103,60 + 14,43 + 63,96 + 20,94 + 39,54 + 12,08 + 5,01 + 164,01 + 223,65 + 138,10 + 79,75 \text{ (T5)} = 2.757,83 \text{ m} \times 1,10 = \text{3.033,60 m}$$

$$3) 4,5 \times 14: 96,80 + 18 + 74,72 + 173,95 + 25,99 + 127,50 + 44,94 + 71,34 + 72 + 8,75 + 308,44 + 420,60 + 269,30 = 1.712,33 \times 1,10 =$$

1.883,50 m

CÁLCULO DAS TELHAS

$$T_1: 13,49 \times 11,25$$

$$T_2: 10,83$$

$$T_3: (13,58 + 10,90)$$

$$T_4: (10,43 + 10,90)$$

$$T_5: (10,43 + 4,62)$$

$$T_6: (6,76 + 4,62):$$

$$T_7: (2,99 + 4,62):$$

$$T_8: (2,99 + 10,90)$$

$$T_9: 10,82$$

$$T_{10}: 5,33$$

$$T_{11}: 15,33$$

$$T_{12}: 14,22$$

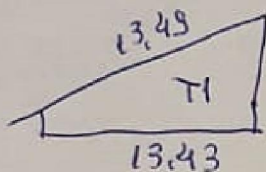
$$T_{13}: 4,83$$

$$\Rightarrow (151,03 \times T_1) + (103 \times T_4) + ()$$

(área de projeção).

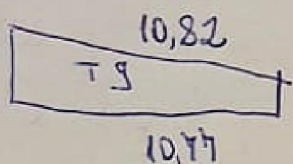
$$\hookrightarrow 352,80 + 365,87 + 940,26 + 35,46 = 1.694,40 \text{ m}^2$$

71)



$$0,0045\%$$

$$\hookrightarrow 13,34 \times 1,0045 = 13,49$$



$$10,77 \times 1,0045 = 10,82$$

$$\therefore \text{Área de Telhas: } 1.694,40 \times 1,0045 = 1.702,05 \text{ m}^2$$

\hookrightarrow Área sem desperaço

$$\Rightarrow \text{Área de Engradamento: } (685,23 + 910,72 + 34,73) \times 1,0045 = 1.638,05 \text{ m}^2$$

* DEMOLICÕES e RETIRADAS

Retirada de Telhas: $321,77 + 709,18 = 1.030,95 \text{ m}^2$

• • xufes, chapins, cumeeiros: $126,85 + 34,20 + 49,80 + 24,38 = 235,23 \text{ m}^2$

• demolição de impermeabil: $53,70 + 76,30 + 18,38 = 148,38 \text{ m}^2$

• Retirada de engradamento: $\left\{ \begin{array}{l} \text{até } 8\text{m: } 6 \\ > 8\text{m: } 8 \end{array} \right.$

- Retirada de perfil metálico das juntas: $(1,5 \times 2) + (1,3 \times 2) = 5,60m$
 $\times 0,30 = 1,68$
- Desobstrução de junta de dilatação $8,6 \times 6,80 = 58,48m^2$ $\times 2,58$
- Remoção de AP's no forro e/ou inclinação em lixante branco: 2unid.
- Demolição de subarbo da platibanda

↳ Demolição CUIDADOSA DE ESTRUTURA DE CONCRETO ESTRUTURAL DE FORMA MANUAL

↳ REF.: 022145 (SBC)

0,211h \rightarrow encarregado
 29,0820h \rightarrow servente } p/m^3

↳ $(101,25 + 79,53 + 23,75) \times 0,25 \times 0,10 = 5,11m^3$

- Demolição de aberturas (calhas): $(15,95 + 13,10 + 63,45 + 52,90) \times 0,35 \times 0,15 = 11,64m^3$

- Retirada de grama: $9,20m^2$

- Demolição piso: $1,67 + 6,20 = 7,87 \times 0,20 = 1,58m^3$

- Encargos) $11,9 \times 1,10 = 13,09m^3$
- Resíduos

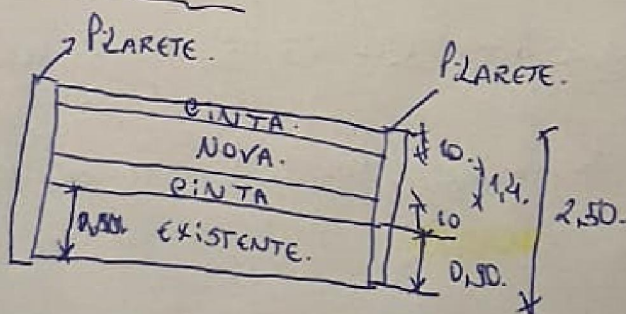
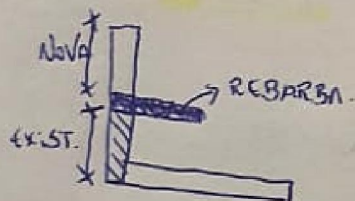
- Bota fora: $124,33 \times 1,05 = 130,55m^3$

PLANTEIO OBRAS

Andaime fachadoiro: $(183,44 \times 5,80) + (63,75 \times 7,88) + (7,50 \times 7,75)$
 $(183,44 \times 5,80) + (41,21 \times 5,80) + (20 \times 5,80) + (21,25 \times 7,57)$
 $= 2.140,30 m^2$

* Retirada de Lousa: $47,78 + 12,98 + 225 = 285,76 m$

ALVENARIAS → PLATIBANDA



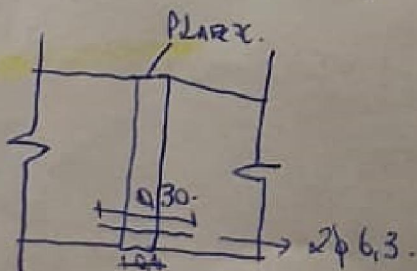
CINTAS: $(0,10 \times 0,10)$



PLARETES: P1: $2,50 h \Rightarrow 136 unidades$

P2: $1,27 h \Rightarrow 6 unidades$

Armação Pilares



$2\phi 6,3 e/ 30cm$

(6)

AMARRAÇÃO } $P_1: 2,50 \div 0,30 = 8 \times 2 = 16 \phi 6,3, \text{comp. } 0,30m.$
 $P_2: 1,27 \div 0,30 = 4 \times 2 = 8 \phi 6,3, \text{comp. } 0,30m.$

$\therefore \phi 6,3: 136 \times 16 \times 0,30 \times 0,25 \times 1,10$ $\frac{Kg/m}{Perda}$ $179,52$ $183,48$
 $6 \times 8 \times 0,30 \times 0,25 \times 1,10$] = ~~$167,16 Kg$~~
 $3,96$

PILARETES:

$\square 4 \phi 8$

est. 0,5, e/ 0,10.

$P_1: 10 \times 10 \times 2,50m.$

Armação: $\left\{ \begin{array}{l} DN 8: 4 \times 2,50 \times 136 \times 0,40 \times 1,10 = 598,40 Kg. \\ \frac{1}{7} \uparrow \text{comp: } 0,38m. \\ \frac{1}{7} \downarrow \end{array} \right. \left[\begin{array}{l} DN 5: 25 \times 0,38 \times 136 \times 0,16 \times 1,10 = \\ 2,5 \div 0,10 = 25 \end{array} \right]$ ~~$202,72 Kg$~~

$P_2: 10 \times 10 \times 1,27m.$

Armação: $\left\{ \begin{array}{l} DN 8: 4 \times 1,27 \times 136 \times 0,40 \times 1,10 = 13,40 kg \\ DN 5: 25 \times 0,38 \times 6 \times 0,16 \times 1,10 = 10,03 kg \end{array} \right.$

Armação (Σ): $\left\{ \begin{array}{l} DN 8: 598,40 + 13,40 = 611,80 Kg \\ DN 5: 202,72 + 10,03 = 212,75 Kg \end{array} \right.$

Perda: $(0,10 \times 0,10 \times 2,50 \times 136) + (0,1 \times 0,1 \times 1,27 \times 6) = 3,48m^3$

Faixa: $(0,10 + 0,10) \times 2,50 \times 136 + (0,1 + 0,1) \times 1,27 \times 6 = 69,55m^2$

CINTAS QUARRAÇÃO : $(113,53 + 103,53 + 12,90 + 47,20) \times 2 =$
 $2 \times = 554,32 \text{ m.}$

10x10
 4 4 8
 est. 4 5,0/10.

Axmação: $\left\{ \begin{array}{l} \text{DN 8: } 4 \times 554,32 \times 0,4 \times 1,1 = 975,60 \text{ kg} \\ \text{DN 5: } 5.543,20 \times 0,38 \times 0,16 \times 1,1 = 370,75 \text{ kg} \end{array} \right.$

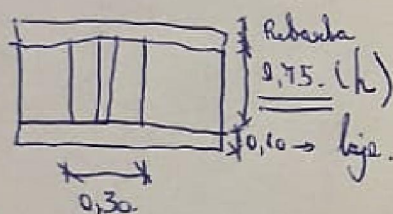
Comp: 0,38
 $A = 554,32 \div 0,10$
 $5.543,20.$

Paralelo: $0,10 \times 0,10 \times 554,32 = 5,55 \text{ m}^3$

Forma: $(0,1 + 0,10) \times \frac{554,32}{2} = 110,85 \text{ m}^2$

OB5:

Derrolização Platicbanda p/ usuração pilaritos:

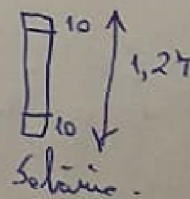


$\Rightarrow \left(\begin{array}{l} 0,30 \times 0,15 \times 136 \\ 0,30 \times 0,65 \times 6 \end{array} \right) = \frac{31,77 \text{ m}^3}{\times 0,15}$
 $= 4,77 \text{ m}^3$

↳ Bota fora: ~~28,36 m~~ 5 m^3

↳ Alvenaria: $(0,20 \times 0,15 \times 136) + (0,20 \times 0,65 \times 6) = 21,18 \text{ m}^3$

Alvenaria Platicbandas: $\frac{554,32 \times 1,40}{2} =$



$\left(\frac{264,26}{113,53 + 103,53 + 47,20} \right) \times 1,40 + (12,90 \times 1,07)$
 $= 383,77 \text{ m}^2$



TOTALIZAÇÃO RAT. BAUDA

(7)

- Injeções pilotes DN ϕ 6,3 mm. (2 ϕ 6,3, e/ 0,30, comp. 0,30m).
167,16 Kg. 183,28 Kg.

- Pilotes 10x10 e/ 2,00m.
4 ϕ 8, estúlos ϕ 5, e/10

Injeções } DN 8: 611,80 Kg
DN 5: 212,75 Kg

lençóis: 3,48 m³

Ferra: 69,55 m²

- Pintos 10x10
4 ϕ 8, est. ϕ 5 e/10.

Injeções } DN 8: 975,60 Kg
DN 5: 370,75 Kg

lençóis: 5,55 m³

Ferra: 110,85 m²

Demolição estruturas: 4,77 m³

Bota-fora: 5 m³

Alumina: 383,77 m²

1: calha e/ platibanda // 2: calha

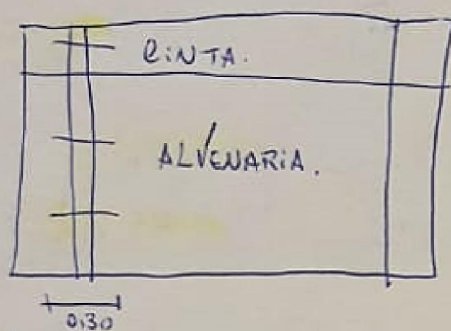
Calhas

comp.	Lados
• 1,10 x 0,40 → 10,95m	1
• 1,10 x 0,70 → 13,13m	1
• 1,10 x 1,05 → 13,75m	1
• 1,10 x 1,45 → 14,95m	1
• 1,10 x 1,25 → 17,20m	1

comp.	Lados
• 1,25 x 0,60 → 12,35	2
• 1,10 x 0,75 → 19,70	1
• 1,25 x 0,60 → 14,85	2
• 1,10 x 0,60 → 18,75m	1

Estrutura p/ Calhas:

- ⇒ Linta 10x10 (10Po)
- ⇒ Pilares 10x10, e/ 2,00m
t apenas p/ calhas acima
de 2,00m)



Nome	altura	A.	Armazenagem
P3	0,40	7	1 x 2
P4	0,40	7	2 x 2
P5	1,05	7	3 x 2
P6	1,25	8	4 x 2
P7	1,25	10	4 x 2
P8	0,60	39	2 x 2
P9	0,75	11	2 x 2

\hookrightarrow Armazenagem: $\phi 6,3$

$$\left[\begin{matrix} P3 \\ (7 \times 2) + \end{matrix} \begin{matrix} P4 \\ (7 \times 4) + \end{matrix} \begin{matrix} P5 \\ (7 \times 6) + \end{matrix} \begin{matrix} P6 \\ (8 \times 8) + \end{matrix} \begin{matrix} P7 \\ (10 \times 8) + \end{matrix} \begin{matrix} P8 \\ (39 \times 4) + \end{matrix} \begin{matrix} P9 \\ (11 \times 4) \end{matrix} \right] \times 0,30 \times 0,25 \times 1,10 = 35,30 \text{ kg}$$

Estrutura

P3

Armazenagem

$$\left. \begin{array}{l} \text{DN 8 : } 4 \times 0,40 \times 7 \times 0,40 \times 1,10 = 4,95 \text{ kg} \\ \text{DN 5 : } 4 \times 0,38 \times 7 \times 0,16 \times 1,10 = 1,85 \text{ kg} \end{array} \right\}$$

Perimetro: $0,1 \times 0,1 \times 0,4 \times 7 = 0,03 \text{ m}^3$

Forma: $0,20 \times 0,4 \times 7 = 0,56 \text{ m}^2$

P4

$$\begin{aligned} \text{Armadura} \left\{ \begin{array}{l} \text{DN 8: } 4 \times 0,7 \times 7 \times 0,4 \times 1,1 = 8,63 \\ \text{DN 5: } 7 \times 0,38 \times 7 \times 0,16 \times 1,1 = 3,28 \end{array} \right. \\ \text{Pavimento: } 0,1 \times 0,1 \times 0,7 \times 7 = 0,05 \\ \text{Forma: } 0,2 \times 0,7 \times 7 = 0,98 \end{aligned}$$

P5

(8)

$$\begin{aligned} \text{Armadura} \left\{ \begin{array}{l} \text{DN 8: } 4 \times 1,05 \times 7 \times 0,4 \times 1,1 = 12,94 \\ \text{DN 5: } 10 \times 0,38 \times 7 \times 0,16 \times 1,1 = 4,68 \end{array} \right. \\ \text{Pavimento: } 0,1 \times 0,1 \times 1,05 \times 7 = 0,08 \\ \text{Forma: } 0,2 \times 1,05 \times 7 = 1,47 \end{aligned}$$

P6

$$\begin{aligned} \text{Armadura} \left\{ \begin{array}{l} \text{DN 8: } 4 \times 1,25 \times 8 \times 0,4 \times 1,1 = 20,42 \\ \text{DN 5: } 14 \times 0,38 \times 8 \times 0,16 \times 1,1 = 7,49 \end{array} \right. \\ \text{Pavimento: } 0,1 \times 0,10 \times 1,45 \times 8 = 0,12 \\ \text{Forma: } 0,2 \times 1,45 \times 8 = 2,32 \end{aligned}$$

P7

$$\begin{aligned} \text{Armadura} \left\{ \begin{array}{l} \text{DN 8: } 4 \times 1,25 \times 10 \times 0,4 \times 1,1 = 22 \\ \text{DN 5: } 12 \times 0,38 \times 10 \times 0,16 \times 1,1 = 8,03 \end{array} \right. \\ \text{Pavimento: } 0,1 \times 0,10 \times 1,25 \times 10 = 0,13 \\ \text{Forma: } 0,2 \times 1,25 \times 10 = 2,50 \end{aligned}$$

P8

$$\begin{aligned} \text{Armadura} \left\{ \begin{array}{l} \text{DN 8: } 4 \times 0,60 \times 39 \times 0,4 \times 1,1 = 41,18 \\ \text{DN 5: } 6 \times 0,38 \times 39 \times 0,16 \times 1,1 = 15,65 \end{array} \right. \\ \text{Pavimento: } 0,1 \times 0,1 \times 0,6 \times 39 = 0,24 \\ \text{Forma: } 0,2 \times 0,6 \times 39 = 4,68 \end{aligned}$$

P9

$$\begin{aligned} \text{Armadura} \left\{ \begin{array}{l} \text{DN 8: } 4 \times 0,75 \times 11 \times 0,4 \times 1,1 = 14,52 \\ \text{DN 5: } 7 \times 0,38 \times 11 \times 0,16 \times 1,1 = 5,15 \end{array} \right. \\ \text{Pavimento: } 0,1 \times 0,1 \times 0,75 \times 11 = 0,08 \\ \text{Forma: } 0,2 \times 0,75 \times 11 = 1,65 \end{aligned}$$

TOTAL:

$$\begin{aligned} \text{Armadura} \left\{ \begin{array}{l} \text{DN 8: } 4,95 + 8,63 + 12,94 + 20,42 + 22 + 41,18 + 14,52 = 124,64 \\ \text{DN 5: } 1,85 + 3,28 + 4,68 + 7,49 + 8,03 + 15,65 + 5,15 = 46,13 \end{array} \right. \end{aligned}$$

$$\text{Pavimento: } 0,03 + 0,05 + 0,08 + 0,12 + 0,13 + 0,24 + 0,08 = 0,73$$

$$\text{Forma: } 0,56 + 0,98 + 1,47 + 2,32 + 2,50 + 4,68 + 1,65 = 14,16$$

$$\text{Cintura: } 52,83 + 25,95 + 65,65 + 12,90 + 14,85 = 172,18 \text{ mm}$$

$$\begin{aligned} \text{Armadura} \left\{ \begin{array}{l} \text{DN 8: } 4 \times 172,18 \times 0,4 \times 1,10 = 303,05 \text{ kg} \\ \text{DN 5: } 1,721 \times 0,38 \times 0,16 \times 1,10 = 115,10 \text{ kg} \end{array} \right. \end{aligned}$$

$$\text{Forma: } 0,20 \times 172,18$$

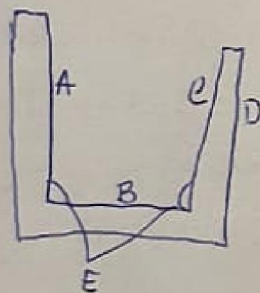
$$= 34,44 \text{ m}^2$$

$$\text{Pavimento: } 0,1 \times 0,1 \times 172,18 = 1,73 \text{ m}^3$$

Alvenaria das paredes: $(0,3 \times 10,95) + (0,6 \times 13,10) + (0,95 \times 13,75)$
 (descontar L: $0,10 \rightarrow$ linter): $+ (1,35 \times 14,95) + (1,15 \times 17,20) +$
 $(0,5 \times 12,35 \times 2) + (0,65 \times 19,70) + (0,5 \times 14,85 \times 2) +$
 $(0,5 \times 18,75) = 113,55 \text{ m}^2$

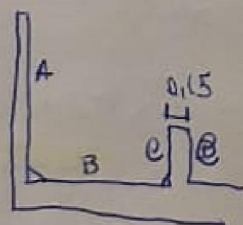
Alvenaria Junto Dilataç: $\left[(2 \times 1,10) + (1,1 \times 1,75) + (1,1 \times 1,5) \right] \times 2$
 $= 11,55 \text{ m}^2$

Impermeabilização



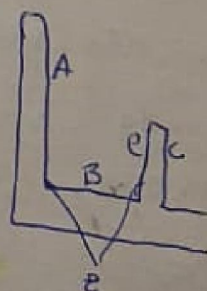
- ① Camada de Regularização: $A+B+C+D = 719,81 \text{ m}^2$ ^{+23,44}
- ② Manta Asfáltica: $A+B+C+D = 719,81 \text{ m}^2$ ^{+23,45}
- ③ Isolamento Térmico: B $153,46 \text{ m}^2$ ^{+18,20}
- ④ Proteção Mecânica: $A+B+C+D = 719,81 \text{ m}^2$ ^{+23,45}
- ⑤ Tala Deploy: $A+C+D = 566,35 \text{ m}^2$ ^{+23,45}
- ⑥ Mastique: E $271,30 \text{ m}^2$ ^{+17,55}

1) Latta $1,10 \times 0,40 \rightarrow 10,95 \text{ m}$



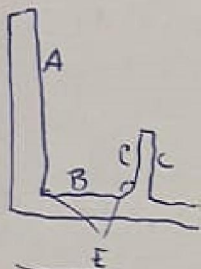
A = 2,35
 B = 1,10
 C = $0,4 \times 2 = 0,8$
 E = $10,95 \times 2$

2) Latta: $1,10 \times 0,70 \rightarrow 13,13$



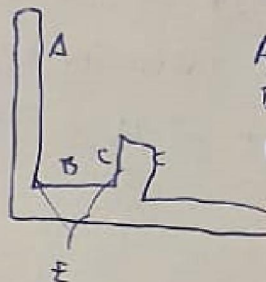
A = 2,35
 B = 1,10
 C = $0,7 \times 2 = 1,4$
 E = $13,13 \times 2$

3) Latta $1,1 \times 1,05 \rightarrow 13,75m$



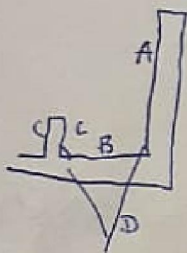
$$\begin{aligned} A &= 2,35 \\ B &= 1,10 \\ C &= 1,05 \times 2 \\ E &= 13,75 \times 2 \end{aligned}$$

4) Latta $1,10 \times 1,45 \rightarrow 14,95m$ 9



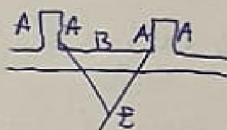
$$\begin{aligned} A &= 2,35 \\ B &= 1,10 \\ C &= 1,45 \times 2 \\ E &= 14,95 \times 2 \end{aligned}$$

5) Latta $1,10 \times 1,25 \rightarrow 17,20m$



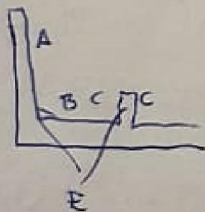
$$\begin{aligned} A &= 2,35 \\ B &= 1,10 \\ C &= 1,25 \times 2 \\ D &= 17,20 \times 2 \end{aligned}$$

6) Latta $1,25 \times 0,60 \rightarrow 12,35m$



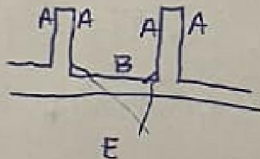
$$\begin{aligned} A &= 0,60 \times 2 \\ B &= 1,25 \\ E &= 12,35 \times 2 \end{aligned}$$

7) Latta $1,10 \times 0,75 \rightarrow 19,70m$



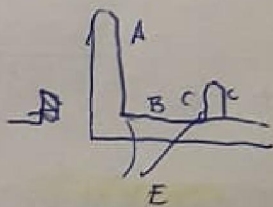
$$\begin{aligned} A &= 2,35 \\ B &= 1,10 \\ C &= 0,75 \times 2 \\ E &= 19,70 \times 2 \end{aligned}$$

8) Latta $1,25 \times 0,60 \rightarrow 14,85$



$$\begin{aligned} A &= 0,60 \times 2 \\ B &= 1,25 \\ E &= 14,85 \times 2 \end{aligned}$$

9) Latta $1,10 \times 0,60 \rightarrow 18,75m$



$$\begin{aligned} A &= 2,35 \\ B &= 1,10 \\ C &= 0,60 \times 2 \\ E &= 18,75 \times 2 \end{aligned}$$

10) Juntas / Fundos de Lattas:

$$\begin{aligned} & 1 \times (1,10 \times 2,35) \\ & 1 \times (1,25 \times 2,35) \end{aligned} \left. \begin{array}{l} \text{Fundos.} \\ \text{Juntas.} \end{array} \right\} \begin{array}{l} (1,10 \times 2) \times 2 \\ (1,10 \times 1,75) \times 2 \\ (1,10 \times 1,50) \times 2 \end{array} \left. \begin{array}{l} \text{Fundos.} \\ \text{Juntas.} \end{array} \right\} 27,41 \text{ m}^2$$

① Lameira de Regularização:

$$\textcircled{A}: (2,35 \times 10,95) + (2,35 \times 13,13) + (2,35 \times 13,75) + (2,35 \times 14,95) + (2,35 \times 17,20) + (0,60 \times 4 \times 12,35) + (2,35 \times 19,70) + (0,60 \times 4 \times 14,95) + (2,35 \times 18,75) + 27,41 = 347,50 \text{ m}^2$$

∴

$$A + C + D \rightarrow \textcircled{1} / \textcircled{2} / \textcircled{4} / \textcircled{5}$$

$$B \rightarrow \textcircled{1} / \textcircled{2} / \textcircled{3} / \textcircled{4}$$

$$\textcircled{E} \rightarrow \textcircled{6}$$

Laje Embuada:
23,45 m²

$$\begin{aligned} \textcircled{A} + \textcircled{C} + \textcircled{D}: & \text{calha 1} \\ & (2,35 + 0,8 + 0,15) \times 10,95 + (2,35 + 1,4 + 0,15) \times 13,13 + \\ & (2,35 + 2,10 + 0,15) \times 13,75 + (2,35 + 1,45 \times 2 + 0,15) \times 14,95 + \\ & (2,35 + 2,5 \times 2 + 0,15) \times 17,20 + (0,6 \times 4 + 0,30) \times 12,35 + (2,35 + 0,75 \times 2 + 0,15) \times 19,70 \\ & (0,6 \times 4 + 0,30) \times 14,85 + (2,35 + 0,6 \times 2 + 0,15) \times 18,75 + 27,41 = 566,35 \text{ m}^2 \end{aligned}$$

$$\textcircled{3}: (1,1 \times 10,95) + (1,1 \times 13,13) + (1,1 \times 13,75) + (1,1 \times 14,95) + (1,1 \times 17,20) + (1,25 \times 12,35) + (1,1 \times 19,70) + (1,25 \times 14,85) + (1,1 \times 18,75) = 153,46 \text{ m}^2$$

$$\textcircled{E}: (10,95 \times 2) + (13,13 \times 2) + (13,75 \times 2) + (14,95 \times 2) + (17,20 \times 2) + (12,35 \times 2) + (19,70 \times 2) + (14,85 \times 2) + (18,75 \times 2) = 271,30 \text{ m}^2$$

Revestimentos:

$$\ast \text{ ALVENARIAS: } 388,77 + 113,51 + 11,55 = 513,83 \text{ m}^2$$

508,87

$$\ast \text{ Chapisco: } 1.027,66 \text{ m}^2 \quad 1.017,14 \text{ m}^2$$

$$\ast \text{ Reboco: } 1.027,66 \text{ m}^2 \quad 1.017,14 \text{ m}^2$$

$$\ast \text{ Pastilha: } (65 + 152,5 + 47,80) \times 1,6 + (13 \times 1,27) = 441 \text{ m}^2$$

(10)

* Tratamento da Junta de dilatação

$$(1,1 \times 3) + (1,3 \times 3) + (3,25 \times 3) = 16,95 \text{ mm.}$$

* Refo lingadeira: $7,6 + 152,05 + 65 + 13,15 + 47,80 + (14 + 1,3) \times 3 = 292,80 \text{ mm}$

* Latta #24, diam. 1,85 \Rightarrow 7,35 mm
larg. 0,60.

* Refo lateral: $15,80 + 127,70 + (6,4 \times 2) + 24,65 + 9,45 = 190,40 \text{ mm.}$

* Puxadeira: 34,70 mm.

* Tacos em bancado: DN 100: 2 / DN 150: 3

* Bolo Hemisférico: DN 100: 8 / DN 150: 3 / DN 200: 4

* Tachos PVC: DN 100: 16 / DN 150: 6 / DN 200: 8

* Tubo PVC: DN 100: $3 \times (7,5 \times 3) + 14,66 + 5,23 + 1,20 \rightarrow 48 \text{ mm}$

DN 150: $2 \times (10,75) + 3,10 + 3,10 + (7,2 \times 2) = 11,08$

* ex Pass: $60 \times 60 \times 60$: 3

\downarrow
45,5 mm

1. 485. 277,72

\rightarrow 1510. 1932

Inf. 1527. 9117 \rightarrow Litar Ofício / Processo Recusar.

Doc. Form. Perm.: 1529. 9641

Ext. Lqui. Planj.: 1529. 9825

Tic Est. Toc. Bul.: 1529. 9855

Mqra Pisco: 1529. 9919

Lic. Proj. B.: 1564. 6901

Análise de Composições

ARA-06- LIGAÇÃO ENTRE ESTRUTURAS / ALVENARIA.

$$P_1 \Rightarrow L = 2,50$$

$$\hookrightarrow 136 \text{ unidades: } 179,52 \text{ kg}$$

$$\hookrightarrow 136 \times 2,5 = 340 \text{ m.}$$

$$340 \text{ m} - 179,52 \text{ kg}$$

$$1 \text{ m} - x$$

$$\hookrightarrow 0,528 \text{ kg/m.}$$

$$P_2 \Rightarrow L = 1,27$$

$$6 \text{ unidades: } 3,96 \text{ kg}$$

$$\hookrightarrow 6 \times 1,27 = 7,62 \text{ m}$$

$$7,62 \text{ m} - 3,96 \text{ kg}$$

$$1 \text{ m} - x$$

$$0,520 \text{ kg/m.}$$

$$\text{Média: } 0,524 \text{ kg/m.}$$

$$\hookrightarrow P_1: 136 \times 2,5$$

$$P_2: 6 \times 1,27$$

$$P_3: 7 \times 0,4$$

$$P_4: 7 \times 0,7$$

$$P_5: 7 \times 1,05$$

$$P_6: 8 \times 1,45$$

$$P_7: 10 \times 1,25$$

$$P_8: 33 \times 0,6$$

$$P_9: 11 \times 0,75$$

$$= 416,62 \text{ m.}$$

∴ Amarração: $183,48 +$

$$\left. \begin{array}{l} \text{Armação DN 8} \\ \text{DN 5} \end{array} \right\} \begin{array}{l} 611,80 \\ 212,75 \end{array}$$

$$\text{Parante: } 3,48$$

$$\text{Forma: } 69,55$$

$$\text{Deschida de: } 4,77$$

$$\text{Bota fora: } 5,3$$

$$\text{Alvenaria: } 383,77$$

Platibanda.
Calhas.
 $35,30$

$$124,64 = 736,44 \text{ kg}$$

$$46,13 = 258,88 \text{ kg}$$

$$0,73 = 4,21 \text{ m}^3$$

$$14,16 = 83,71 \text{ m}^2$$

$$+ 113,55 + 11,55 = 508,89 \text{ m}^2$$

CINTAS DE AMARRAÇÃO:	LATIBANDA		Palhas. (11)
	Amarrar	DN 8 : 975,60	303,05 = 1.278,65
		DN 5 : 370,75	115,10 = 485,85
	Penete:	5,55	1,73 = 7,28
	Forma:	110,85	34,44 = 145,29 m ²

ANÁLISE Composição EN GRADAMENTO:

9,68.	Caibros: $4,5 \times 4,5 \rightarrow$	14.022,00	p/ 1.638,05 m ² .
19,40.	Tercos: $4,5 \times 10 \rightarrow$	3.033,60	
27,17	Pontal: $4,5 \times 14 \rightarrow$	1.883,50	

$$14.022 \text{ m} \rightarrow 1.638,05 \text{ m}^2 \rightarrow$$

$$\times \quad - \quad 1 \text{ m}^2$$

↓
Ref. SINAP.
100.387.

↳ Caibros: 8,56 / m².
Tercos: 1,85 / m².
Pont: 1,15 / m².

código.	coef.	}	cóg.	coef.
93281	0,0106		4430	
93282	0,0139		5075	
88262	0,538		4472	
88239	0,198		4425.	

Breg: 390271 → 0,006.
5061 0,009

ARQ 14

Ajud. Bombeiro: 0,5 88248 0,55

Bombeiro 0,5 → 88267 0,55

Adesivo p/ tubo PVC → 0,01 Kg.

0,01 → 1 Kg.
x - 0,85

↳ 0,0085 → 122 (SINAPI) 0,0095

Solução Limpadora.

1 litro → 0,003

↳ 0,003 → 20083 (SINAPI) 0,005

↳ Rolo (SETOP)

MATED-12568.

0,02699 - 3,6
x - 30

ARQ-17

larp.	0,2	100 - 1,05
Aj larp.	0,2	185 - x
		<u>1,9425</u>

EP05 } 3ix
 } 3x
 } 1x

Placa.

Pedreiro → 0,17

Aj. → 0,0482

Pintor → 0,2892

Servente → 0,17

Paga Mad. 5,5x5,5 → 1,71 m
10,5x5,5 → 0,45

Tinta ovinha Sint: 0,02698 6l

Aguarras 0,92 → 0,00482 lata

Lixa Mad → 0,0964 unid.

Brago 1230 0,017 kg.

SUDECAB.
83. 17.31.
0,17 / unid.