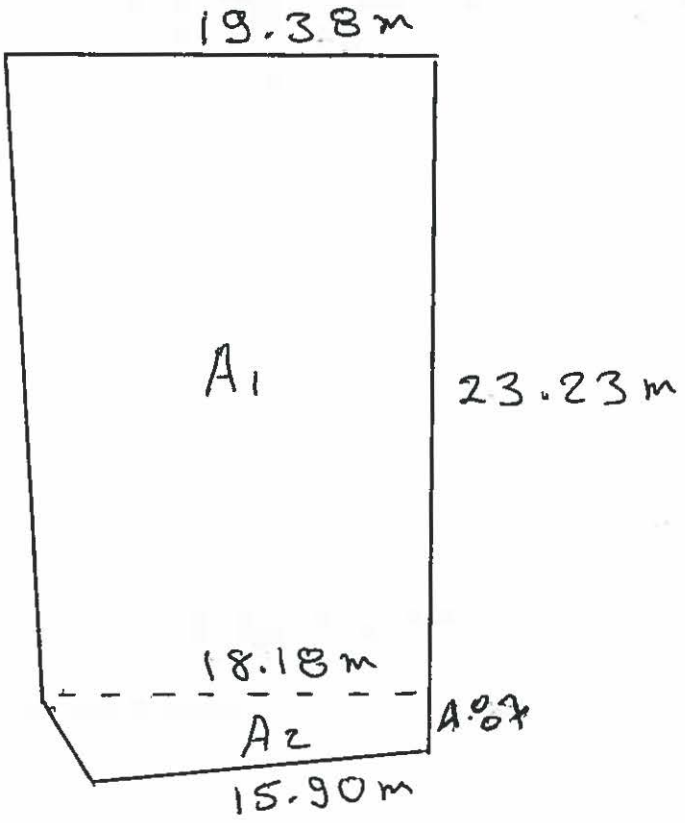
2.3 MEMORIA Y CALCULOS DE VOLUMENES DE OBRA

131 Trago por metro cuadrado



$A_1 = \left(\frac{19.38 + 18.18}{2}\right) \times 23.23 = 436.26$ m

$A_2 = \left(\frac{18.18 + 15.90}{2}\right) \times 4.87 = 83.00$

$\Sigma A_1 + A_2 = 519.26$

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A- 0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

DIN - FISDL
21 JUN. 2017
REVISADO

1.4.1 Excavación a Mano hasta 1.50 mt.

Excavación Para fundación S-F y Tensores no incluye zapatas

SF= L= 5.07 + 3.05 + 5.50 + 6.0 + 6.10 + 1.93 +
15.90 + 2.0 + 2.48 + 2.48 + 1.13 + 1.13 + 1.13 +
2.48 + 2.48 + 2.31 + 2.89 + 1.93 + 2.16 +
2.41 + 2.41 + 1.66 + 4.10 + 3.74 + 3.74 + 3.15 +
3.05 + 1.33 + 5.60 + 4.10 + 4.10 + 5.56 + 3.05 +
0.20 + 2.70 + 1.27 + 0.55 + 0.55 + 5.86 +
5.86 + 12.53 + 2.47 + 4.25 + 1.41 + 1.41 =
= 155.25 mtl.

Tensores 4.63 + 4.24 + 4.63 + 3.06 + 6.10 + 6.10 +
4.63 = 33.39 mtl.

Vol SF + Vol Tens = (155.25 mtl x 0.65 x 0.40) +
(33.39 m x 0.65 x 0.25)
= 45.78 m^3

Excavación Para Zapatas

= 10 zapatas x 2.0 m x 2.0 m x 1.50 m

= 60 m^3

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMAN
ARQUITECTO
REGISTRO A 0993
M.O.P. San Salvador, El Salvador, C. A.

Excavación MR-1

Longitud = 4.58 * 2 = 9.16 ml.

altura = 0.40 + 0.30 = 0.70 mts.

ancho = 1.20 mts.

$\Delta_1 = 0.70 \times 1.20 \times 9.16 = 7.69 m^3$

$\Delta_2 = \frac{0 + 1.60}{2} \times 9.16 \times 1.20 = 8.79 m^3$

$\Delta_1 + \Delta_2 = 7.69 + 8.79$

$\Delta = 16.48 m^3$

$V_T = 45.78 m^3 + 60 m^3 + 16.48 m^3$

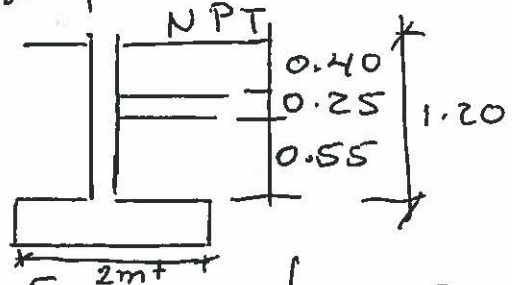
$V_T = 122.26 m^3$

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS
JOSE ARMANDO [illegible]
ARQUITECTO
REGISTRO [illegible]
M.O.P. V.M.V.D.U. El Salvador

1 5 2 Compactación

Zapatas

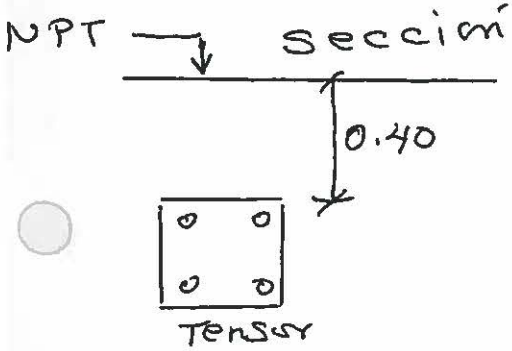


V = [10 Zapatas x 2mt x 2mt * (0.60x0.60)] x 1.20m

$V = 47.568\ m^3$

Compactación Sobre tensores =

Long de Tensores = 61.17mts. (solo Tensores)



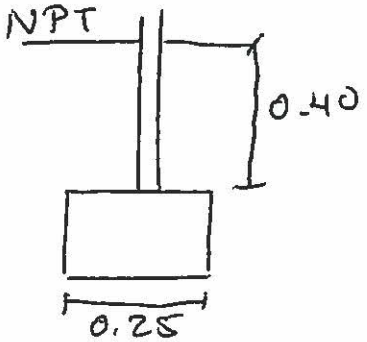
sección 0.25 x 0.25

V = 61.17mts x 0.40mts x 0.25m

$V = 6.12\ m^3$

Compactación Sobre Solera de Fundación

Lsolera = 170.35 mts



V = 170.35mts x (0.25 - 0.15) x 0.40

$V = 6.81\ mts^3$

$V_{Tcomp.} = 47.57m^3 + 6.12m^3 + 6.81mts^3$

$V_{Tcomp} = 60.50\ m^3$

1-6-1 Desalojo

Ripio Pared = 283.60 * 0.14
= 39.70 m³

Ripio Lamina de techo = 370 x 0.15
= 55.50 m³

Ripio de Est. de Concreto = 22.49 m³

Ripio Muro de Piedra = 124.54 m³

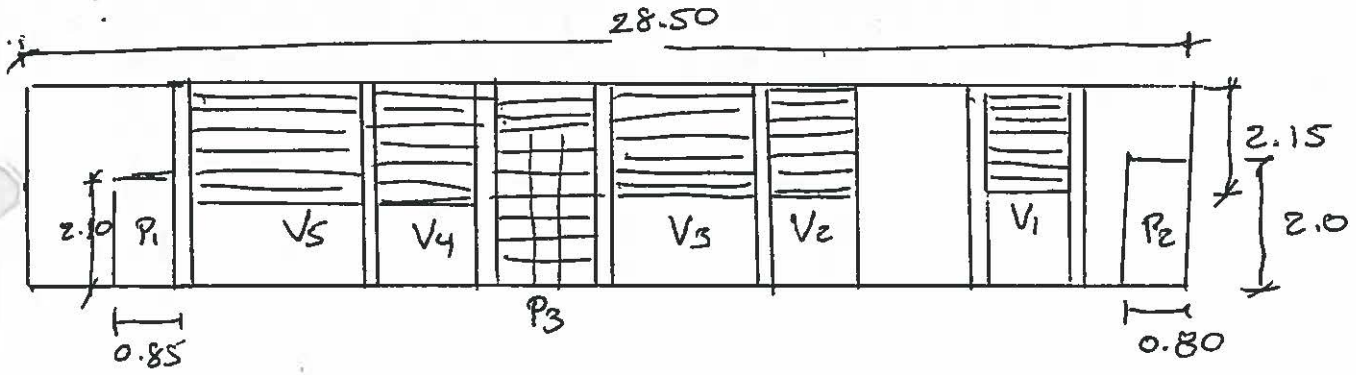
Ripio Piso = 361 x 0.02
= 7.22 m³

Excavación = 122.26 m³

Volumen Desalojo
= 39.70 + 55.50 + 22.49 + 124.54 + 7.22 + 122.26
= 371.71 m³

Vol. de desalojo = 371.71 m³

17.2 Demolición de Pared



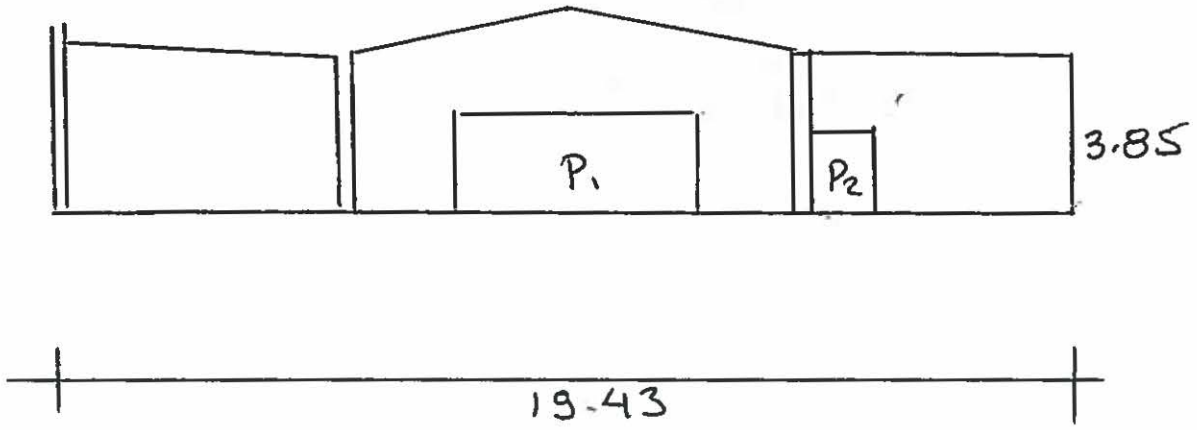
Area de Pared = (3.60mt x 28.50) - Avent - Apuerta - Apuerta Reja

Area de Pared = 102.60m² - V1 - (V2) - V3 - V4 - V5 - P1 - P2 - P - Acolum

= 102.60 m² - (1.90 x 1.95) - (1.85 x 1.95) - (1.60 x 1.95) - (3.75 x 1.95) - (3.75 x 1.95) - (0.85 x 2.10) - (0.80 x 2.0) - (1.90 x 3.15) - (0.25 x 3.60 x 7col

$A_{P1} = 61.87\ m^2$

Fachada Principal a Demoler.



$$A_{pared} = (3.85 \times 4.70) + 5.95 \times \frac{(3.85 + 4.0)}{2} +$$

$$3.85 \times \frac{(4.40 * 3.83)}{2} \times 2 \text{ Lados} - \text{Area Puerta}_1 - A_{P2} -$$

Area de columnas

$$= 94.99 - A_{P1} - A_{P2}$$

$$= 94.99\ m^2 - (1.90 \times 1) - (4.88 \times 2.45) - (0.20 \times 3.8) \times$$

$$= 79.61\ m^2$$

Area de Paredes $= 79.61\ m^2$

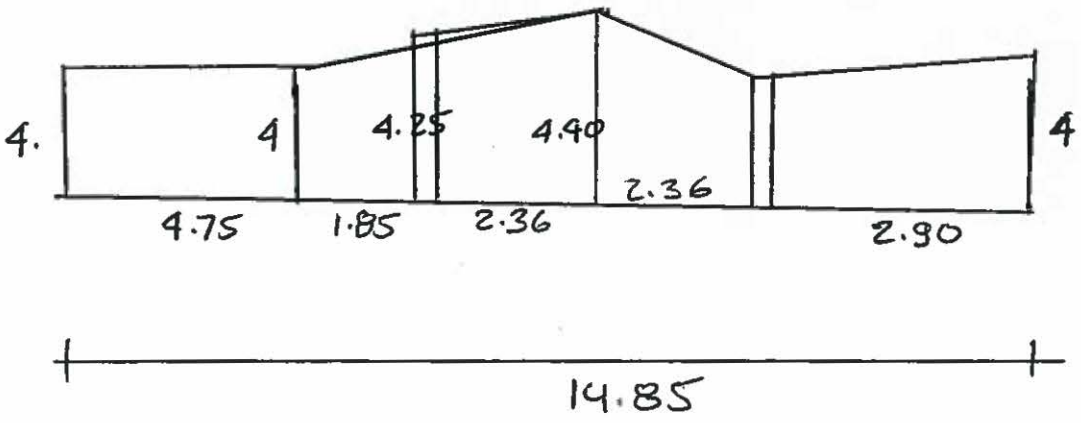
$A_{P2} = 79.61\ m^2$

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO [illegible] CUZMAN
ARQUITECTO
REGISTRO [illegible]
M.O.P. VMVDU El Salvador, C.A.

1:72

Fachada Posterior a Demoler.



$$A_{pared} = (4 \times 4.75) + \frac{(4+4.25)}{2} \times 1.85 + \left[\frac{(4.25+4.40)}{2} \times 2.36\right] \times 2 + (2.90 \times 4) - A_{col.}$$

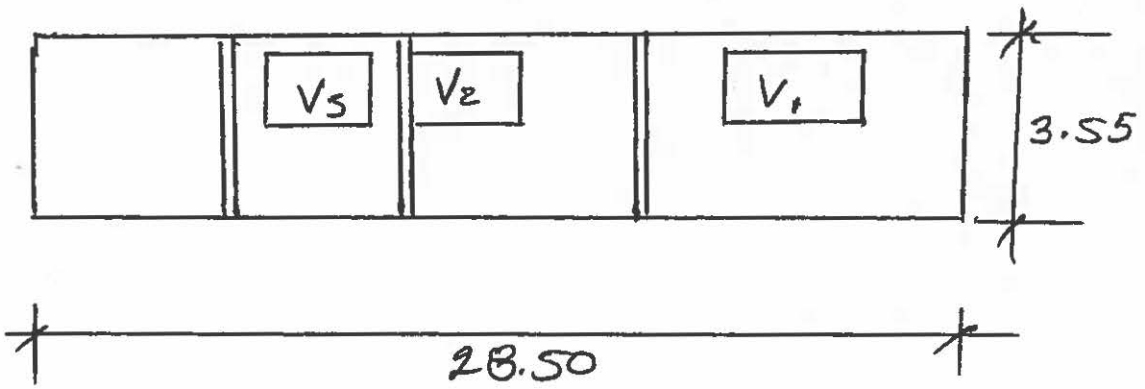
$$= 58.64 - (4.25 \times 0.2 \times 2\,col) = 56.94\ m^2$$

$$A_{pared} = \underline{56.94\ m^2}$$

$$A_{ps} = \underline{56.94\ m^2}$$

172

Elev. Lat. Oriente
Pared a demoler



Area de Pared = (28.50 x 3.55) - V_1 - V_2 - V_3 - Col

= 101.175 - (2.8 x 1.65) - (2.80 x 1.65) - (2.8 x 1.65) - (0.20 x 3.55 x 3 col)

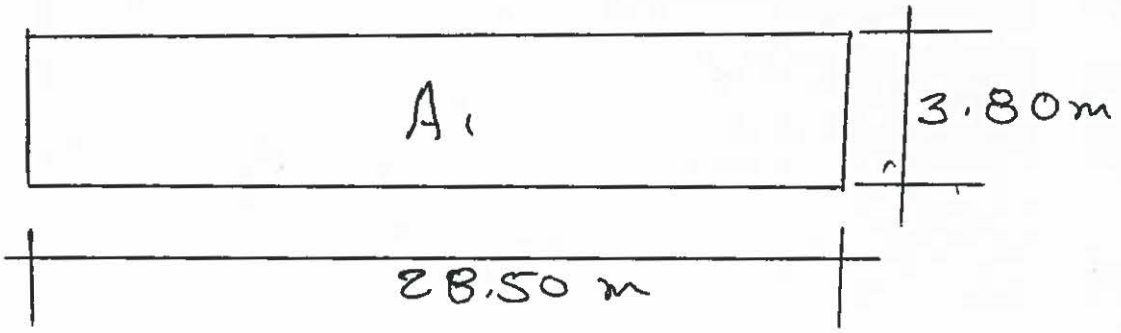
= 101.17 - 13.86 - 2.13

A_{P4} = 85.18 m²

A total de Paredes a demoler = 61.87 + 79.61 + 56.99 + 85.18

A_{Total} = 283.60 m²

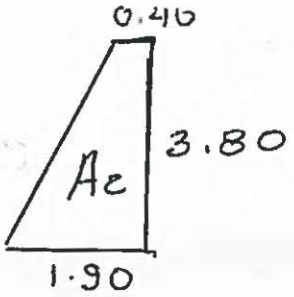
1.74 Demolición de Muro de Piedra



$A_1 = 28.50 \times 3.80\ m^2$

$A_1 = 108.30\ m^2$

Sección del muro



Sección de Muro A =

$= \frac{(0.40 + 1.90)}{2} \times 3.80 = 4.37\ m^2$

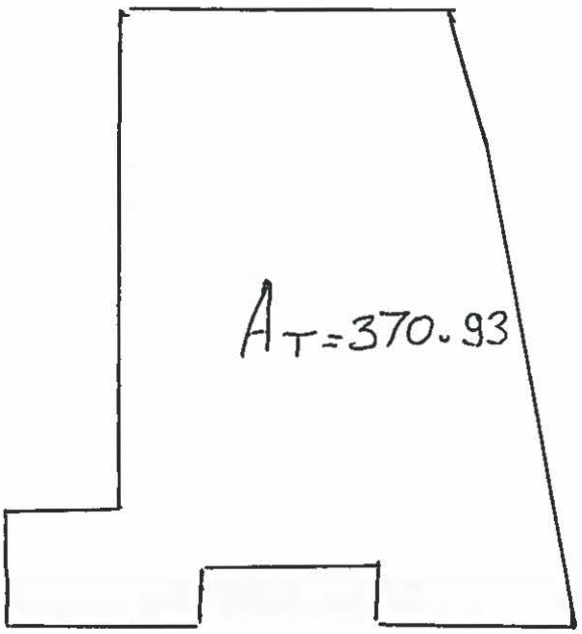
$VoL = 4.37\ m^2 \times 28.50\ m^2$

$VoL = 124.54\ m^3$

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A- 0893
M.O.P. V.M.V.D.U. El Salvador, C.A.

Piso a Demoler

1 7 211 Demolición de Piso



Area de Piso a demoler =

= 370.93 − Area de Paredes

Aparedes = (27mt x 0.15) + (4.05 x 0.15) + (1.32 x 0.15) + (21.08 x 0.15) + (1.58 x 0.15) + (1.19 x 0.15) + (1.35 x 0.15) + (3.04 x 0.15) + (1.19 x 0.15) + (3.08 x 0.15) +

= 4.05 m² + 0.60 + 0.19 + 3.16 + 0.48 + 0.18 + 0.20 + 0.46 + 0.17 + 0.46 = 9.95 m

Area de Piso a demoler = 370.93 − 9.95 =

Area de Piso a demoler = 361 m²

1.9.5 Desmontaje de Ventanas

Tomando la Areas descontadas a las Paredes (Por ventanas) se tiene

(2.8x1.65)+(2.80x1.65)+(2.8x1.65)+
(1.90x1.95+(1.85x1.95)+(1.60x1.95)+
(3.75x1.95)+(3.75x1.95)+

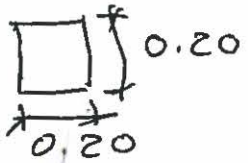
1.95 Desmontaje de Ventanas = 38.90 m²

1.7.3 Demolición de Concreto Armado

Demolición de Columnas Tomando en cuenta Las longitodes de columnas quese vieron en Las Paredes

L= (3.55 * 3)+
(3.60 x 7)+
(3.80 x 2)+
(4.25 x 2) = 51.95 mts

sección de la col



V= 51.95x0.20x0.20 = 2.07 m³

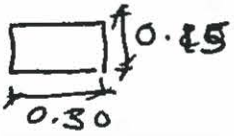
V= 2.07 m³

1.7.3 Demolicion de Concreto Armado.

Long. de Paredes = 28.50 + 61.87 + 79.61 + 56.94 =

Long = 226.92 mts.

Demolicion de Solera de Fund. = 226.92 x secc. de Solera

Sec. de S.F = 

A = 0.15 x 0.30

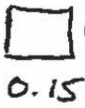
$\Rightarrow V = 226.92 \times 0.15 \times 0.30 = 10.21\ m^3$

Vol = 10.21 m^3

Solera intermedia igual a solera de Corona $L = 226.92 \times 2$

$L = 453.84$

$\Rightarrow$ Vol = 453.84 x Secc. de Soleras

Sec. Sol = 

Vol = 453.84 m x 0.15 x 0.15

Vol = 10.21 m^3

1-7.3 Demolición de Concreto armado

$= 10.21\ m^3 + 10.21\ m^3 + 2.07\ m^3$

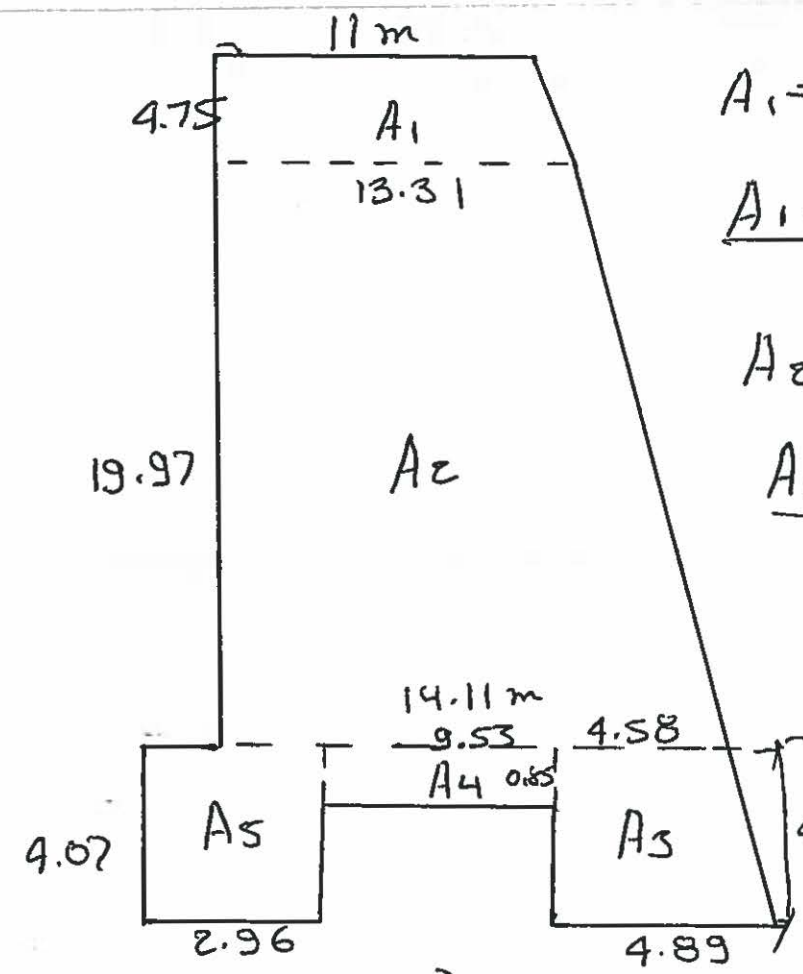
Vol = 22.49 m^3

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMAN
ARQUITECTO
REGISTRO A- 0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

DIN - FISDL
21 JUN. 2017
REVISADO

Area de techo

1 91 Desmontaje de Lamina de Techo



$$A_1 = \frac{(11 + 13.31) \times 4.75}{2}$$

$$A_1 = 57.73\ m^2$$

$$A_2 = \frac{(13.31 + 14.11) \times 19.97}{2}$$

$$A_2 = 273.79\ m^2$$

$$A_4 = 9.53 \times 0.85$$

$$A_4 = 8.10\ m^2$$

$$A_3 = \frac{(4.58 + 4.89) \times 4.07}{2}$$

$$A_3 = 19.27\ m^2$$

$$A_5 = 4.07 \times 2.96 = 12.04\ m^2$$

$$A_5 = 12.04\ m^2$$

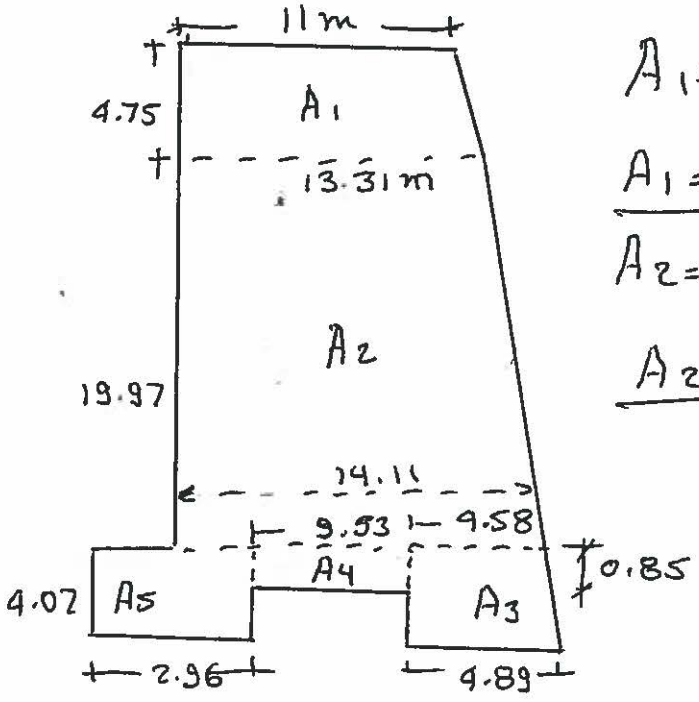
$$A_T = A_1 + A_2 + A_3 + A_4 + A_5$$

$$\boxed{A_T = 370.93\ m^2}$$

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A- 0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

192 Desmontaje de Estructura Metalica.



$A_1 = \frac{(11 + 13.31) \times 4.75}{2}$

$A_1 = 57.73\ m^2$

$A_2 = \frac{(13.31 + 14.11) \times 19.97}{2}$

$A_2 = 273.79\ m^2$

$A_3 = \frac{(4.58) + 4.89) \times 4.07}{2}$

$A_3 = 19.27 m^2$

$A_4 = 0.85 \times 9.53$

$A_4 = 8.10\ m^2$

$A_5 = 4.07 \times 2.96 =$

$A_5 = 12.04\ m^2$

$A_T = A_1 + A_2 + A_3 + A_4 + A_5$

$A_T = 370.93\ m^2$

2 12 12 Pilotes de Concreto

⇒ 4 Pilotes x Zapata

2 Pilotes @ 1.50 en M_1 y M_2

Long. de M_2 = 23.19 + 5.59

= 28.78 mt.

M_2 = 4.61 m + 4.61 = 9.22

4 Pilotes x 10 zapatas = 40 pilotes

⇒ M_2 = 28.78 ÷ 1.5 = 19.18

M_2 = 19.18 + 1 = 20

Pilotes en M_1 = 20 x 2 = 40 Pilotes

⇒ M_2 = 4.61 ÷ 1.5 = 3.07

M_2 = 3.07 + 1 = 4

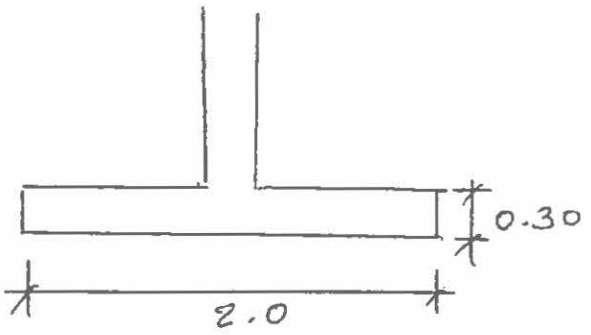
Pilotes en M_2 = 4 x 2 Lados = 8 Pilotes

Total de Pilotes = 88 pilotes

Long. Total de Pilotes = 88 x 6mts = 528mt

= 528 mt de Pilotes

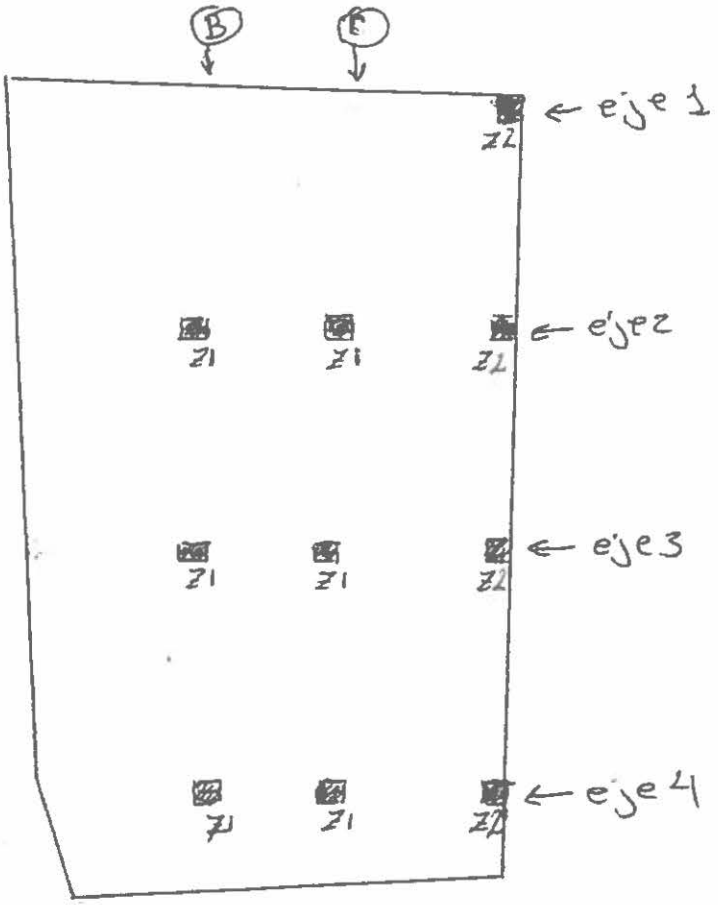
6 | 62 Zapata 6=0.30 ref. #4 @10m
A.S. 12 f'_c = 210 Kg/cm²



10 Zapatas

V = 10 Zapatas x 2.0m x 0.30m x 2.0m

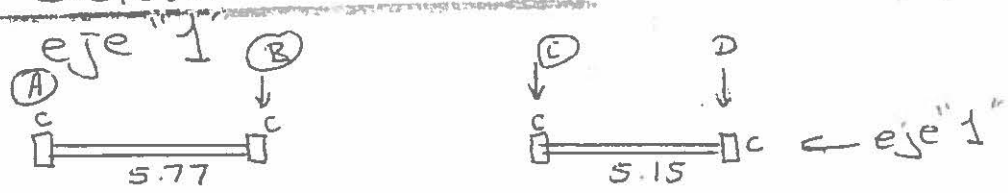
V = 12 m³



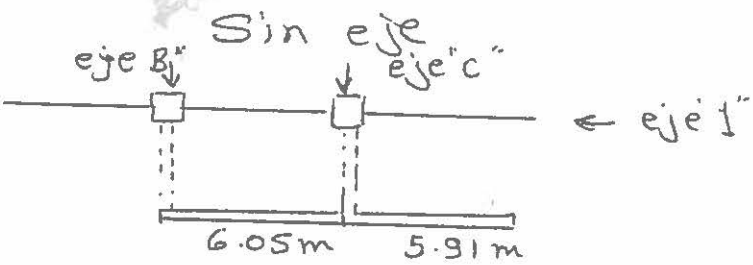
DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMAN
ARQUITECTO
REGISTRO A 0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

2 Z 106 Solera de Fundación de Concreto

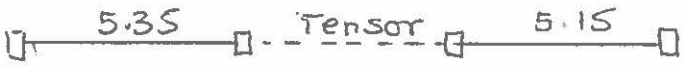


$L = 5.77 + 5.15 = \underline{10.92 \text{ mts}}$



$L = 6.05 + 5.91 = \underline{11.96 \text{ mts}}$

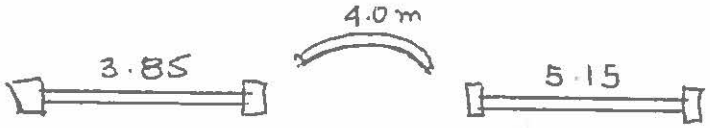
Solera de Fundacion eje "2"



$L = 5.35 \text{ mt} + 5.15 \text{m} = \underline{10.05 \text{ mts}}$

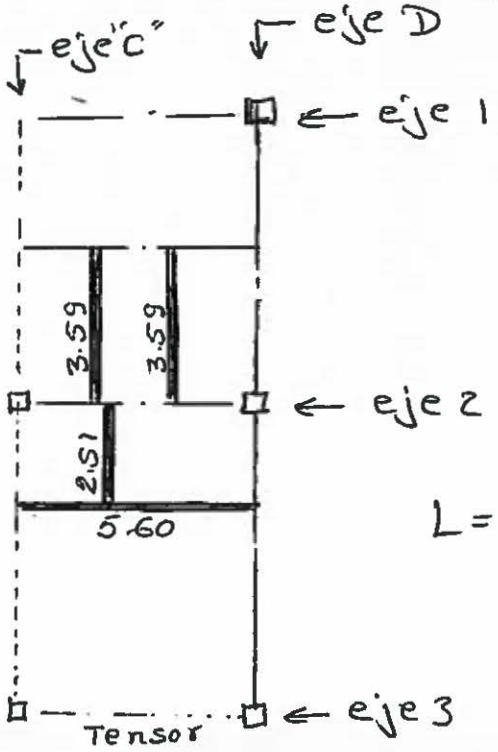
Solera de Fundación eje "3"
Solo Tensores

solera de Fundacion eje "4"



$L = 3.85 \text{ mt} + 4.0 + 5.15 = \underline{13.0 \text{ mts}}$

Solera de Fundación entre ejes ①-3 y C.D

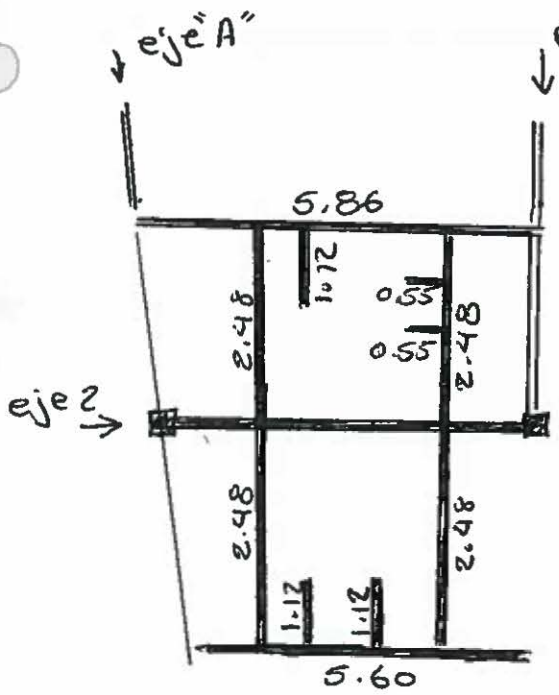


$L = 3.59 \times 2 + 5.60 + 2.51$

$L = 15.29$ mts

DIN - FISDL
21 JUN. 2017
REVISADO

Solera de Fundación en Serv. Sanit.



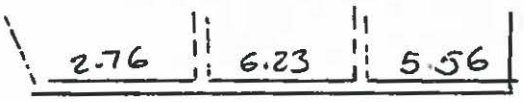
$L = 2.48 + 2.48 + (1.12 \times 3) + 2.48 + 2.48 + 0.55 + 0.55 + 5.86 + 5.60$

$L = 25.84$ mts

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A-0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

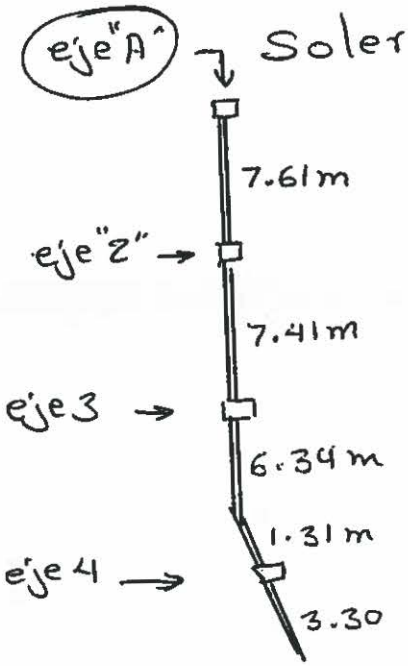
Solera de Fundaciones de Concreto

eje "5"



$L = 2.76 + 6.23 + 5.56 =$ 14.55 mts

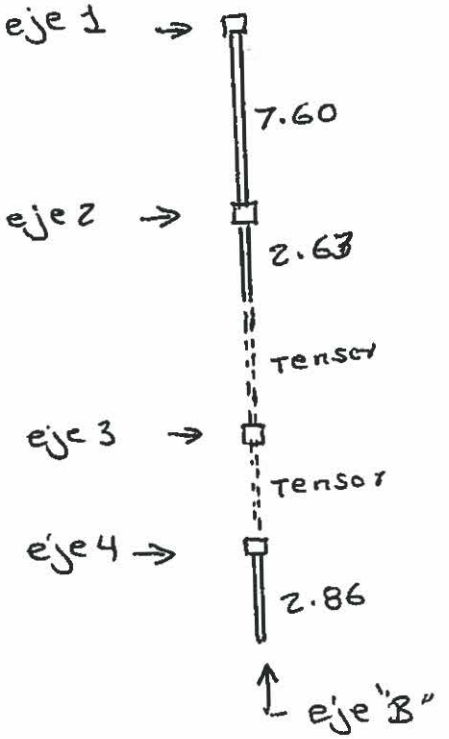
Solera de Fundación eje "A"



$L = 7.61 + 7.41 + 6.34 + 1.31 + 3.30$

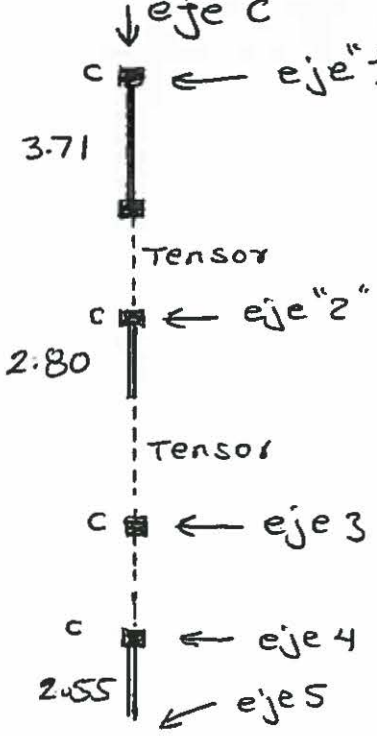
$L =$ 14.55 mts

Solera de Fundación eje "B"



$L = 7.60 + 2.63 + 2.86 =$ 13.09 mts

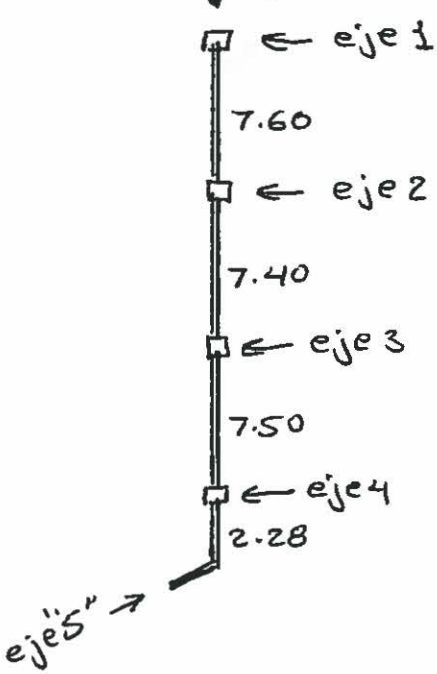
Solera de Fundación eje "C"



L = 3.71m + 2.80 m + 2.55m

L = 9.06 mts

Solera de Fundación eje "D"



L = 7.60 + 7.40 + 7.50 + 2.28

L = 24.75 mts

Solera de Fundación en acceso Gradas

$L = 2.47 + (2.41 \times 2) = 7.29$ mts

Σ Longitud Total de Solera de Fundación

10.92 + 11.96 + 10.05 + 13.0mt +
14.55 + 14.55 + 13.09 + 9.06 +
24.75 + 15.29 + 25.84 + 7.29 = 170.35 mt

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO VIGENTE DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMAN
ARQUITECTO
REGISTRO A 0694
M.O.P. V.M.V.D.U. El Salvador, C.A.

2 3 18 Bloque solera 15x20x40

L = 410.46 ÷ 2.90

L = 141.54 mts.

Solera en 1° Nivel

2.90 ÷ 0.60 = 5 hiladas de soleras.

141.54 x 5 = 707.70 ml.

Area utilizada por bloque Solera

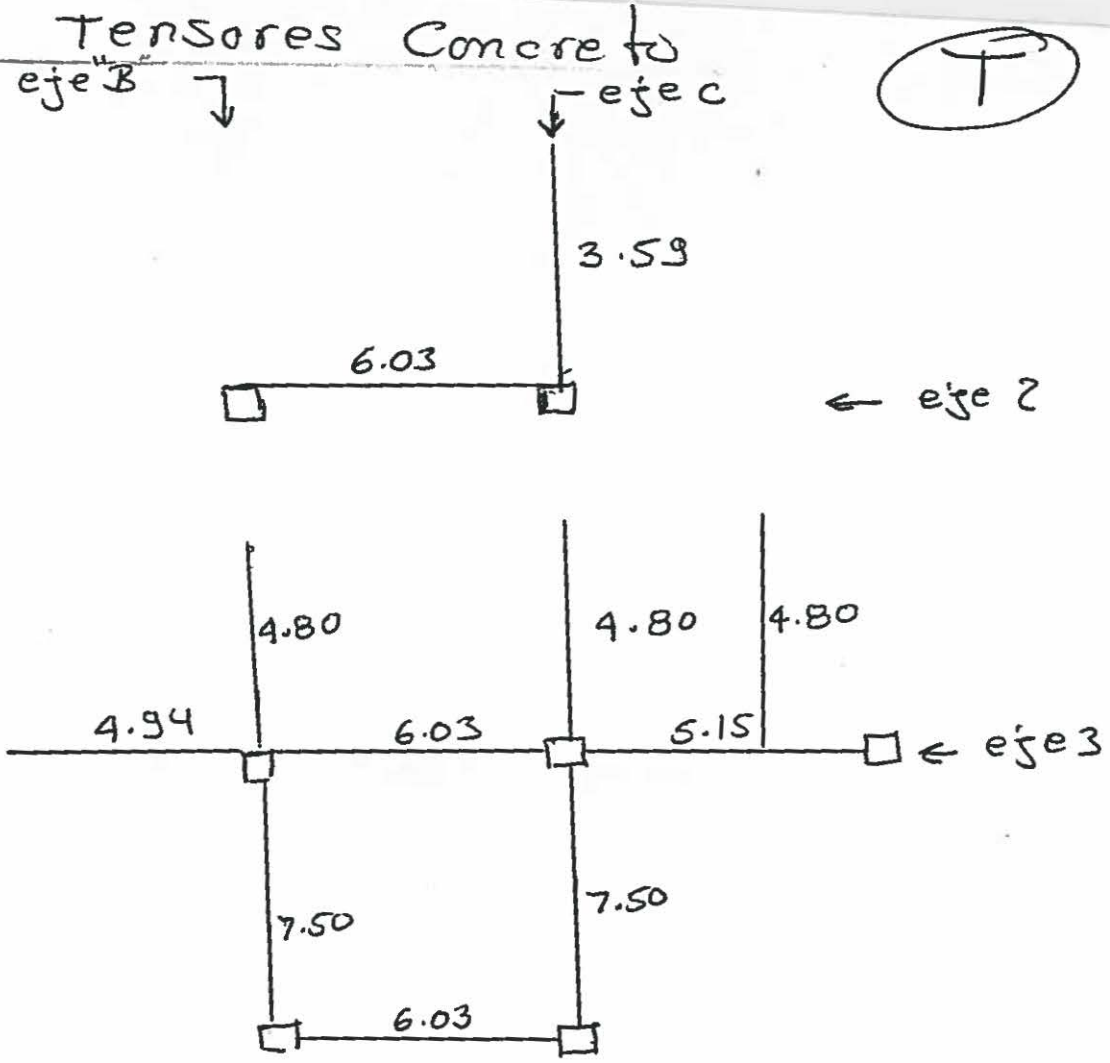
707.70 x 0.20 = 141.54 ml.

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMAN
ARQUITECTO
REGISTRO N° 10005
M.O.P. V.M.V.D.U. El Salvador, C.A.

2.14 2 Tensores Concreto

(T)



$L = 3.59 + 6.03 + 4.80 + 4.80 + 4.80 + 4.94 + 6.03 + 5.15 + 7.50 + 7.50 + 6.03 = 61.17$ mtl.

Sección $0.25 \times 0.25\ m^2$

$V = 0.25 \times 0.25 \times 61.17$

$V = 3.82\ m^3$

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A-0893
M.O.P. V.M.V.D.U. El Salvador, C.A.

S/codigo: Columnas 0.60*0.60

15 columnas (C1)

h= 2.90

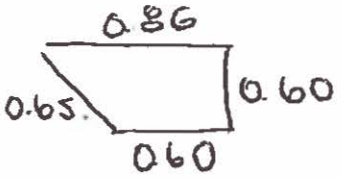
15 columnas * 2.90 = 43.50 mts.

S/codigo Columna C-3

1 columna

h= 2.90

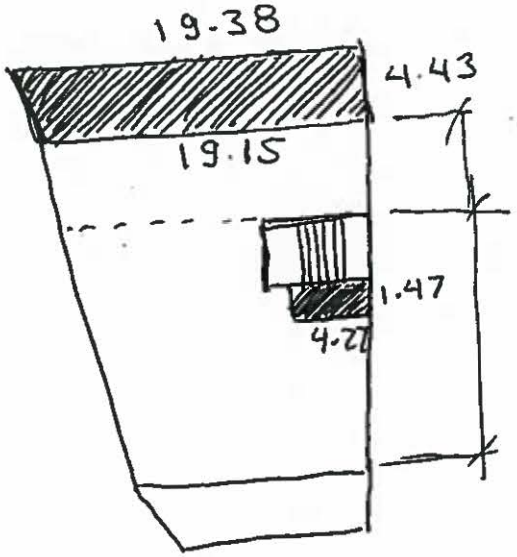
1 columna * 2.90 = 2.90 mts.



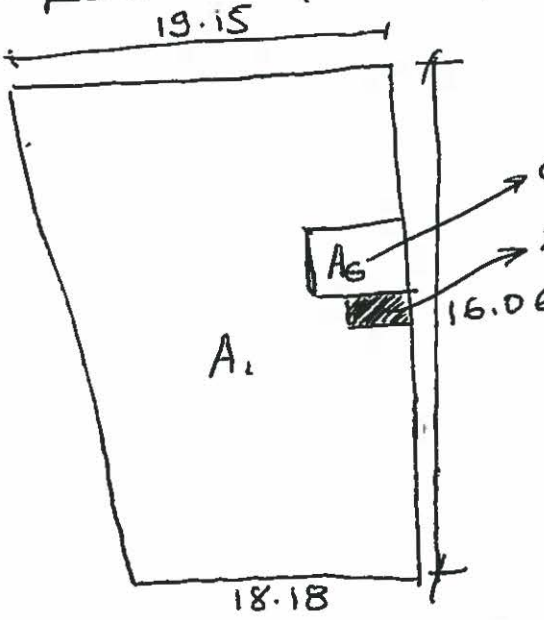
(L-1)

Losa tipo densa

$$\frac{(19.38+19.15)}{2} \times 4.43 + (1.47 \times 4.27) = 91.62\ m^2$$



2 1015 Losa tipo copresa



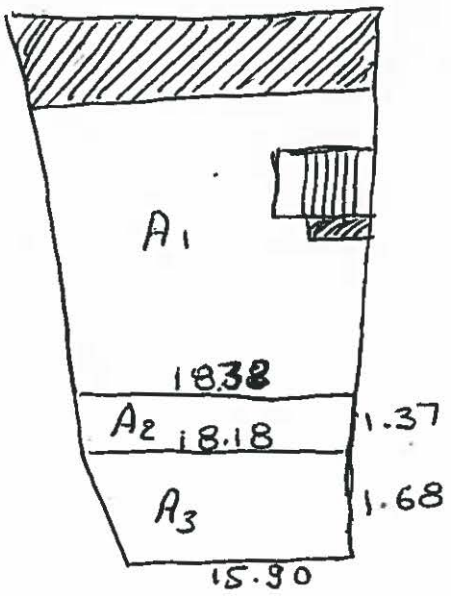
$$A_1 = \frac{(19.15+18.18)}{2} \times 16.06 - (A_G + A_D)$$

$$= 299.76\ m^2 - (4.27 \times 2.58 + 1.47 \times 4.27 m^2)$$

$$= 299.76\ m^2 - (11.02 + 6.28)$$

$$= 282.46\ m^2$$

L-2



$$A_2 = \frac{(18.38 + 18.18)1.37}{2} = 25.04\ m^2$$

$$A_3 = \frac{(18.18 + 15.90)}{2} \times 1.68 = 28.63\ m^2$$

Losa tipo copresa 2-10-15

$= A_1 + A_2 + A_3$

$= 282.46 + 25.04 + 28.63$

$= 336.13\ m^2$

2.17.9 Moldeado de Columnas con Castillo de Madera

16 col x 2.90 x 2.40 = 111.36 m²

Moldeado de Columnas 111.36 m²

2.17.19 Moldeado de vigas al aire incluye pilotes

Viga Vs = (18.56 + 18.12 + 17.70) = 54.38 mtl.

Vigas eje 1, 2, 3, 4 = (5.77 + 5.15) + (5.35 + 6.03 + 5.15) + (4.94 + 6.03 + 5.15) + (3.85 + 6.02 + 5.15)
= 58.59 mtl.

Vigas eje A y D = (7.61 + 7.41 + 6.39 + 1.22) + (7.60 + 7.40 + 7.50
= 45.13 mtl.

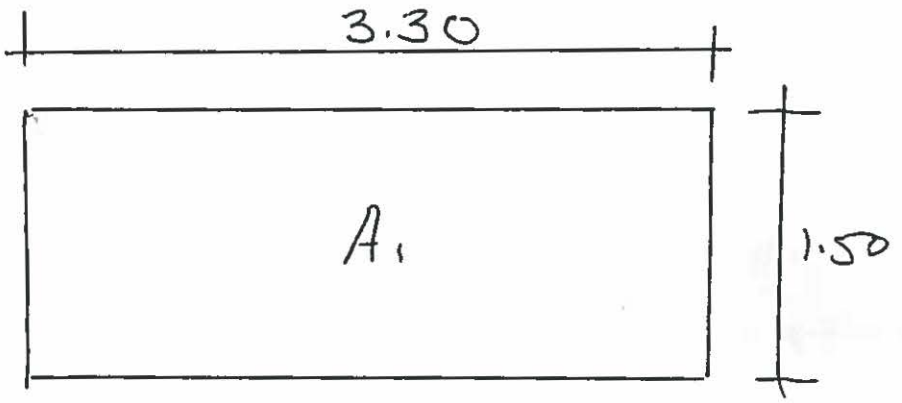
Vigas eje B y C =
= (7.60 + 7.41 + 7.50) + (7.60 + 7.41 + 7.50) = 45.02

V-1 = 7.32 mtl.

Moldeado de Vigas = Σ = 54.38 + 58.59 + 45.13 + 45.02 + 7.32 =

Moldeado de Vigas = 210.44 mtl.

2 10 12 Losa de Concreto en Fundaciones
e = 20cm. con ref. en 2L #4@20 A.S.
concreto 210 Kg/cm acero G. 40



$A = 3.30 \times 1.50 = 4.95 m^2$

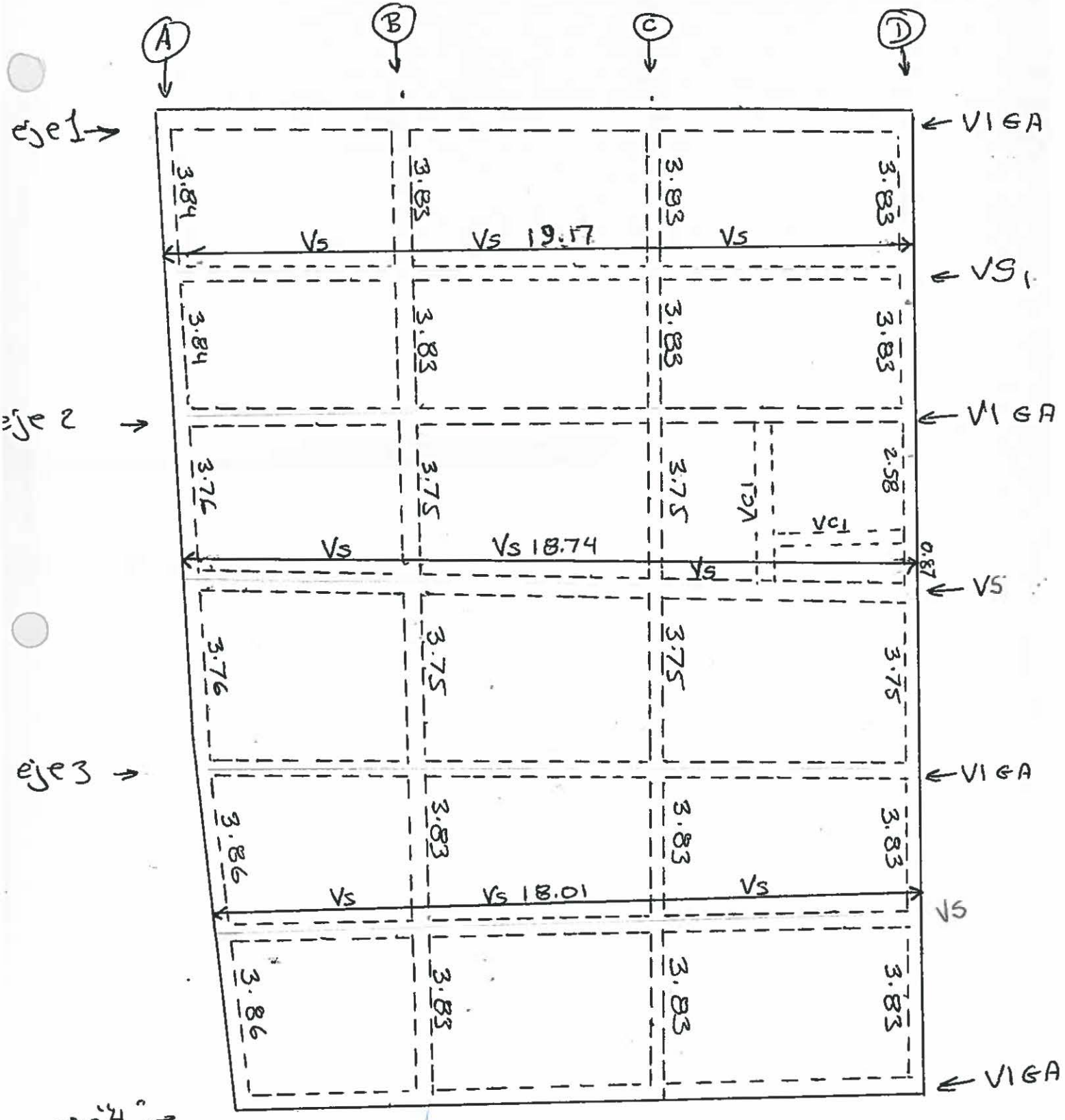
$Vol = 4.95 \times 0.20$

$Vol = 1.03 m^3$

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVELLANO GUZMÁN
ARQUITECTO
REGISTRO [illegible]
M.O.P. V.M.V.D.U. El Salvador, C.A.

VIGAS DE CONCRETO



REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO ALEMAN GUZMAN
ARQUITECTO
REGISTRO
M.O.P. V.M.V.D.U. El Salvador, C.A.

DIN - FISCAL
21 JUN. 2017
REVISADO

Las Vigas (VIGA) de eje 1-2-3-4 se han Tomado medidas de extremo a extremo

VIGA eje "1" = L = 19.38
VIGA eje "2" = L = 18.94
VIGA eje "3" = L = 18.53
VIGA eje "4" = L = 17.42

VIGA eje 1-2-3-4 = L = 74.27

VIGA eje (A) = 3.84 + 3.84 + 3.76 + 3.76 + 3.86 + 3.86 mt

V = 22.94 mts

VIGA eje (B) = 3.83 + 3.83 + 3.75 + 3.75 + 3.83 + 3.83

VIGA eje (B) = 22.82 mts

VIGA eje (C) = 3.83 + 3.83 + 3.75 + 3.75 + 3.83 + 3.83 = 22.

VIGA eje (D) = 3.83 + 3.83 + 2.58 + 0.87 + 3.75 + 3.83 + 3.83
= 22.52 mt

VIGAS eje A - D
= L = 22.94 mt + 22.52

VIGA eje A - D = 22.94 + 22.52 = 45.46

VIGA eje B - C = 22.82 + 22.82 = 45.46 mt.

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A-0993
M.O.P. VM.V.D.U. El Salvador, C.A.

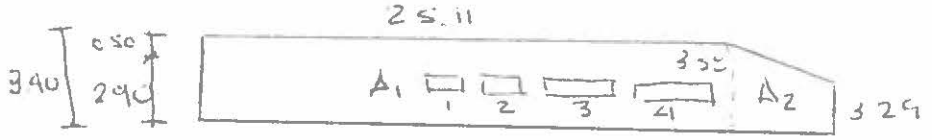
DIN - TISDL
21 JUN. 2017
REVISADO

VIGA Vs = 19.17ml + 18.74m + 18.01 = 55.92m

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A- 0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

DIN - FISDL
21 JUN. 2017
REVISADO

Pared de bloque 15 cms
1º Nivel "Eje A"



$V_1 = 2.90 \times 1.50 = 3.6\ m^2$

$V_2 = 2.90 \times 1.50 + 3.6\ m^2$

$V_3 = 5 \times 1.50 = 7.50\ m^2$

$V_4 = 6 \times 1.50 = 9.0\ m^2$

Area de Ventanas = $23.70\ m^2$

Area Columnas

$A = 4 \times 0.60 \times 2.90 = 6.96$

$A_1 = 2.90 \times 25.11$

$A_1 = 72.82 - 23.70 - 6.96$

$A_1 = 42.16\ m^2$

$$A_2 = \frac{3.58 + 3.29}{2} \times 2.68 = 9.21$$

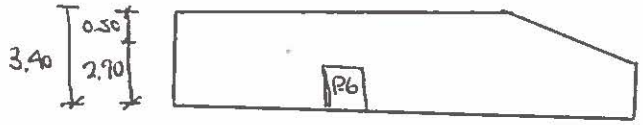
$A_2 = 9.21\ m^2$

Area de Pared Eje "A" Primer Nivel

$A_T = 42.16 + 9.21$

$A_T = 51.37\ m^2$

Pared bloque 15cms
1º Nivel Eje "D"



P-6 = 2.36 × 2.10 = 4.96 m²

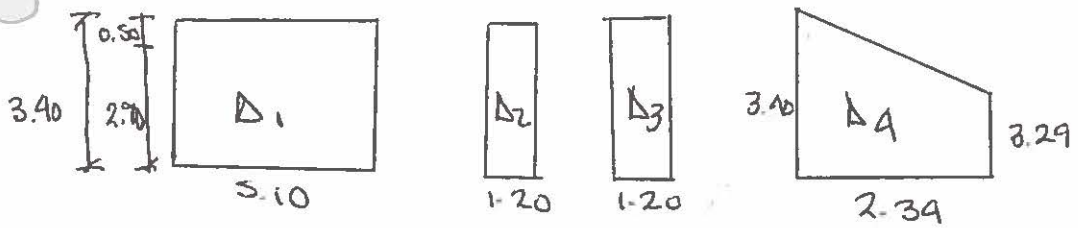
Columnas = 4 × 0.60 × 2.90 = 6.96 m²

$$\Delta = (25.11 \times 2.90) - 4.96 - 6.96 + \left(\frac{3.58 + 3.29}{2} \times 2.68\right)$$

$$\Delta = 72.82 - 11.92 + 9.21$$

$$\Delta = 70.11\ m^2$$

Eje "B" 1º nivel



$\Delta_1 = 2.90 \times 5.10 = 14.79$

$\Delta_2 = 3.40 \times 1.20 = 4.08$

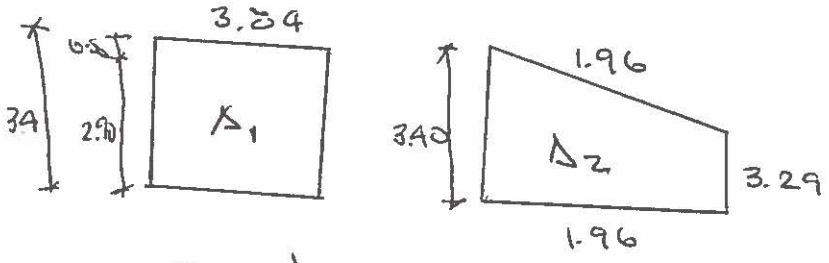
$\Delta_3 = 3.40 \times 1.20 = 4.08$

$$\Delta_4 = \frac{3.40 + 3.29}{2} \times 2.34 = 7.82$$

$\Delta T = 14.79 + 4.08 + 4.08 + 7.82$

$\Delta T = 30.77\ m^2$

Pared bloque 15cms
1° Nivel Eje "C"



Puerta

$P = 0.80 \times 2.10 = 1.68 m^2$

$A_1 = 3.84 \times 2.90$

$A_1 = 11.14 m^2$

$A_2 = \frac{3.40 + 3.29}{2} \times 1.96$

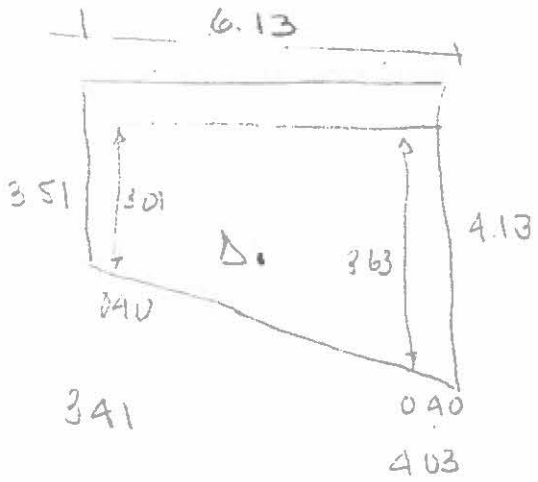
$A_2 = 6.56 m^2$

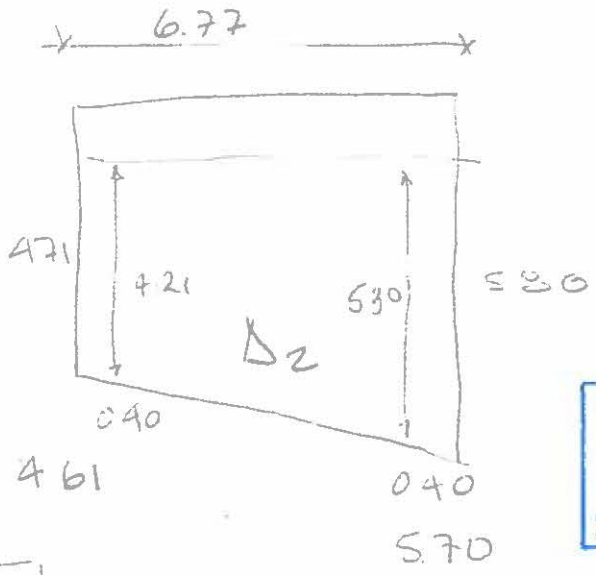
$A_T = 11.14 + 6.56 - 1.68$

$A_T = 16.02 m^2$

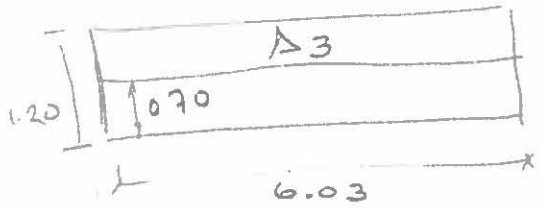
Pared de bloque 15 cms.

1º Nivel eje "1"





DIN - FISDL
21 JUN. 2017
REVISADO



$6.13 - 0.60 - 0.38 = 5.15$

$6.77 - 0.60 - 0.38 = 5.79$

$\Delta_1 = \frac{3.41 + 4.03}{2} * 5.15 - ((1.96 * 1.68) + (2.50 * 2.10))$

$\Delta_2 = \frac{4.61 + 5.70}{2} * 5.79 - (4.23 * 0.85)$

$\Delta_1 = 19.16 - 3.29 - 5.25$

$\Delta_1 = 10.62$

$\Delta_2 = 29.85 - 4.10$

$\Delta_2 = 25.75$

$\Delta_3 = 6.03 * 0.70 = 4.22$

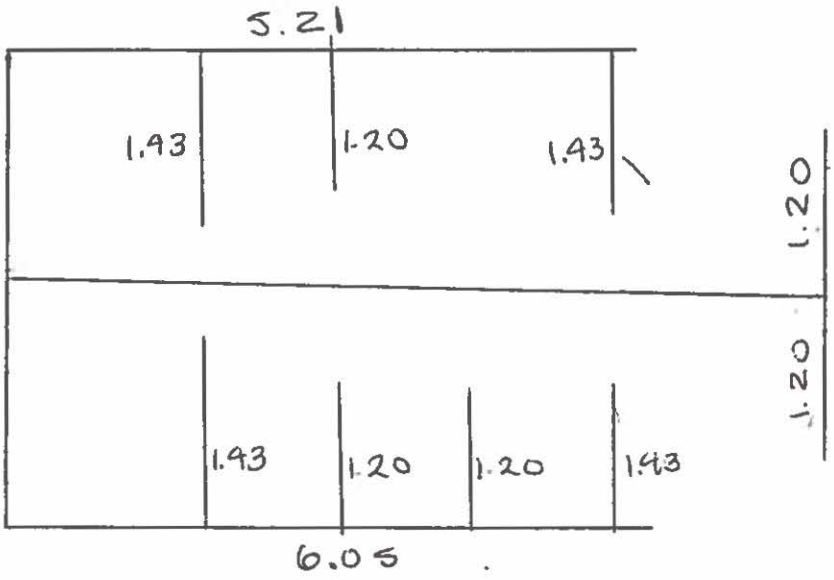
$\Delta T = 10.62 + 25.75 + 4.22 = 40.59\ m^2$

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A-0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

Pared de bloque 15 cms

Primer nivel

Area Interna de baños



Long. de Paredes = (5.21 + 1.43 + 1.20 + 1.93) +
(5.35 + 1.20 + 1.20) +
(1.43 + 1.20 + 1.20 + 1.93) +
6.05

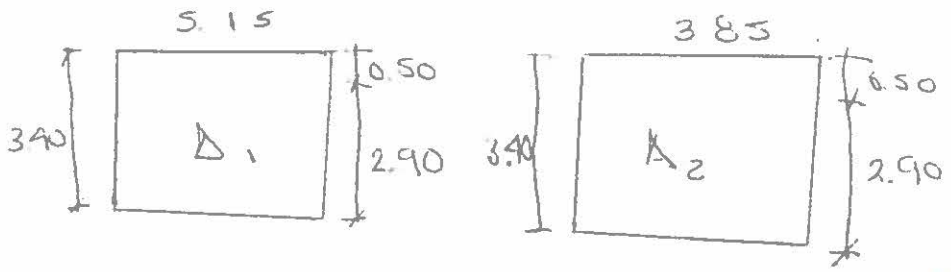
Long. de Paredes = 28.33 ml.

Area = 28.33 * 3.40

Area = 96.32 m^2

Pared de bloque 15 cms

1er nivel eje "4"

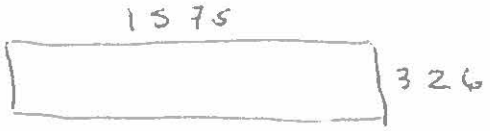


$A_1 + A_2 = (3.85 * 2.90) + (5.15 * 2.90)$

$A_T = 11.17 + 14.94)$

$A_T = 26.11 \text{ m}^2$

Area de Pared Eje "5" Primer Nivel



$A = 15.75 * 3.26$

$A = 51.35 \text{ m}^2$

Area Total Paredes 1° Nivel

Pared Eje "A" = 51.37 m²
Pared Eje "B" = 30.77 m²
Pared Eje "D" = 70.11 m²
Pared Eje "C" = 16.02 m²
Paredes Internas Baños = 96.32 m²
Pared Eje 1" = 40.59 m²
Pared Eje 4 = 26.11 m²
Pared Eje 5 = 51.35 m².

Area Total = 382.64 m²

Cobierta de techo

Polin C de 6" * 1/16 1ª planta

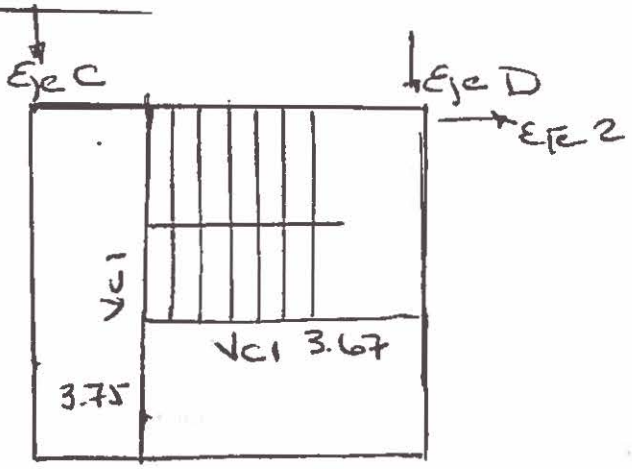
L = 17.29 + 16.83 + 16.30

Polin C = 50.37 m L.

VM2 = Viga Macomber

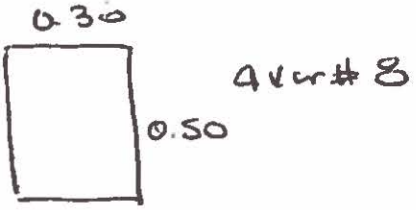
Vm2 = 2.56 mts.

VC1

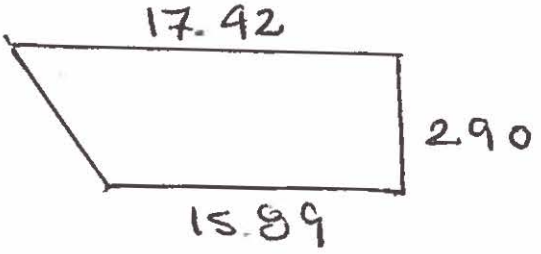


S/cod VC1 = 3.75 + 3.67 = 7.42 ml.

VC1 = 7.42 ml.



- 4 1 9 Cubierta de lamina Zinc-Alum



$$A = \frac{17.42 + 15.89}{2} * 2.90$$

$$A = 48.29\ m^2$$

- 194 l Botaguas lamina galvanizada

0.95 mts de ancho

l = 17.42 ml.

- 492 Cepo Closure (sellador de Espuma)

l = 17.42 + 15.89

l = 33.31 ml.

Piso Terrazo Marmol
1er Nivel.

Bodega General y area de Cisterna

$A = \frac{(6.47 + 6.19)}{2} \times 5.40 = 34.18\ m^2$

Bodega area de Planta Electrica

$A = (5.83 \times 4.31)$ - Area donde se ubica la Planta

$= 25.12\ m^2 - (3.30 \times 1.5) =$

$= 25.12\ m^2 - 4.95 = 20.17\ m^2$

$A = 20.17\ m^2$

Cafeteria y cocina

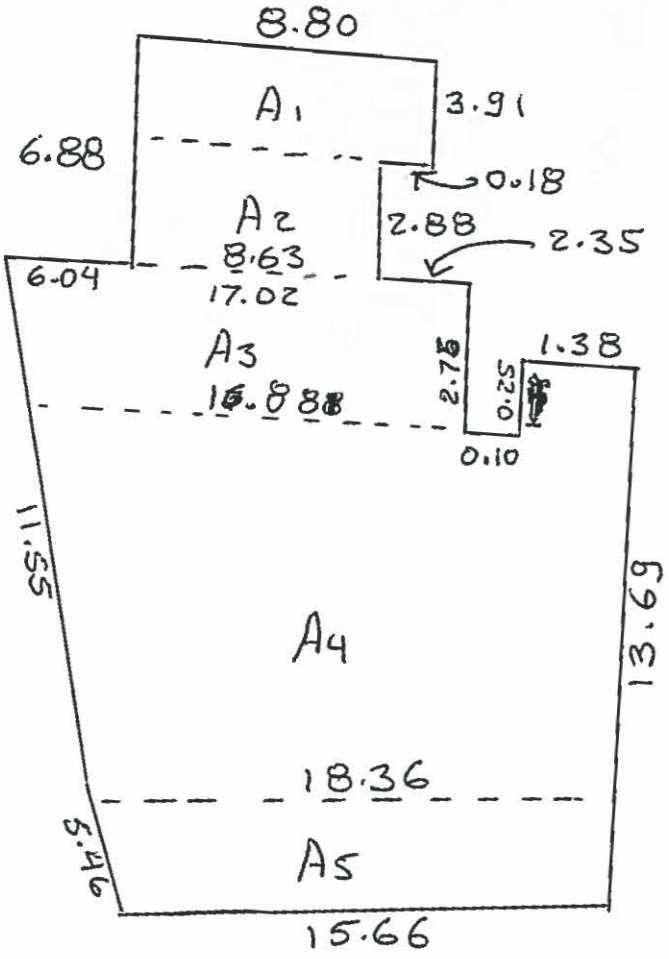
$A = (1.51 \times 3.91) + (1.93 \times 3.91) + (1 \times 0.15)$

$A = 13.60\ m^2$

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A-1998
M.O.P. V.M.V.D.U. El Salvador, C.A.

DIN - FISDL
21 JUN. 2017
REVISADO

Piso Terraza Marmol
1ª Planta



$A_1 = 8.80 \times 3.91 = 34.40\ m^2$

$A_2 = 8.63 \times 2.88 = 24.85\ m^2$

$A_3 = \frac{(17.02 + 16.88) \times 2.75}{2} = 46.61\ m^2$

$A_4 = \frac{(18.36 + 17.88) \times 9.46}{2} = 171.41\ m^2$

$A_5 = \frac{(17.88 + 15.66) \times 4.24}{2} = 71.10\ m^2$

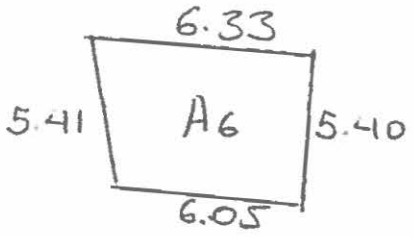
$Gradas = 1.43 \times 2.68 = 3.83\ m^2$

Piso Terrazo Marmol 1er Nivel

$= A_1 + A_2 + A_3 + A_4 + A_5 + Gradas + Bodega + Planta E. +$
$34.40 + 24.85 + 46.61 + 171.41 + 71.10 + 3.83 + 34.18 +$
$20.17 + 13.60 = 420.15$

continua →

Piso Terrazo Marmol
1er Nivel
Area de S. Sanit.



$$A_6 = \frac{(6.33 + 6.05)}{2} \times 5.40$$

$A_6 = 33.41$ - Paredes

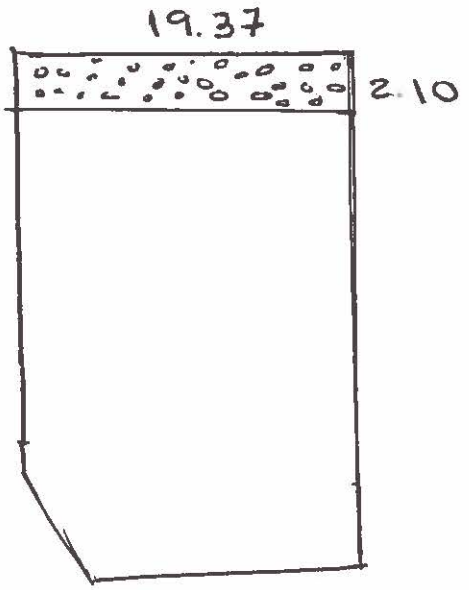
$= 33.41 - 1.97$

$A_6 = 31.44\ m^2$

Σ TOTAL Piso Terrazo Marmol 1er Nivel

$= 420.15 + 31.44 = 713.30\ m^2$

5-3-1 Piso encementado s/piedra cuarta



A = 19.37 * 2.10

A = 40.68 m²

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMAN
ARQUITECTO
REGISTRO N.A. 0593
M.O.P. V.M.V.D.U. El Salvador, C.A.

6 3 4 Puertas

P1 = Puerta de vidrio bronce laminado 2.40 * 2.20 Mocheta y Marco aluminio hard coat anodizado (1 unid

P2 = S/codigo, Puerta estructura de Pino y Forro termoformada de 1.00 * 2.10 (1 unida

P3 = S/codigo, Puerta estructura de pino y Forro termoformada de 1.20 * 2.10 (5 unidad

P4 = Puerta Estructura de pino y ~~Forro~~ Termoformada de 0.80 * 2.10 (3 unidad

P5 = Puerta Estructura de pino y Forro Termoformada de 0.75 * 2.10 (3 unidad

P9 = Puerta Metalica 2.50 * 2.10 dos Alas Mocheta Angulo 1"/4 * 3/16 y forro de lamina hierro 3/32" (1 unidad

P7 = Puerta Estructura de pino y forro Termoformada de 1.50 * 2.10 dos Alas (1 unida

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO CANO GUZMAN
ARQUITECTO
REGISTRO No. 6093
M.O.P. V.M.V.D.U. El Salvador, C. A.

Ventanas

V-1 Marco de Aluminio y Celosia Vidrio Nevado

# de Cuerpos	Cantidad	Alto	Ancho	Area
6	1	1.68	0.86	8.66 m²

V-2 Marco de Aluminio y Celosia Vidrio Nevado

# Cuerpos	Cantidad	Alto	Ancho	Area
3	2	1	0.80	4.80m²

V-4 Marco de Aluminio y Celosia Vidrio Nevado

# Cuerpos	Cantidad	Alto	Ancho	Area
6	1	1.50	1	9.0m²

V-8 Marco de Aluminio y Celosia Vidrio Nevado

# Cuerpos	Cantidad	Alto	Ancho	Area
2	1	1.68	0.98	3.29m²

V-11 Marco de Aluminio y Celosia Vidrio Nevado

# Cuerpos	Cantidad	Alto	Ancho	Area
2	2	2.10	1.0	8.40m²

$A_T = 34.15 M^2$

Acabados

9-1-1 Pintura de Agua (Latex)

Eje A

$A_1 = (2.50 * 25.11) - 23.70 - 6.96 = 32.12$

$A_2 = \frac{3.18 + 2.89}{2} * 2.68 = 8.13$

$A_T = 32.12 + 8.13 = 40.25 * 2 = \underline{80.50 m^2}$

Eje D

$A = (2.50 * 25.11) - 4.96 - 6.96 + (\frac{3.18 + 2.89}{2} * 2.68)$

$A = 62.78 - 4.96 - 6.96 + 8.13$

$A_T = \underline{58.99 m^2}$

Eje B

$A_1 = 2.50 * 5.10 = 12.75$

$A_2 = 3 * 1.20 = 3.60$

$A_3 = 3 * 1.20 = 3.60$

$A_4 = \frac{3 + 2.89}{2} * 2.34 = 6.89$

$A = 26.84 m^2 * 2$

$A_T = \underline{53.68 m^2}$

Eje C

$A_1 = 3.84 * 2.50 = 9.60$

$A_2 = \frac{3 * 2.89}{2} * 1.96 = 5.77$

$A_T = 15.37 m^2 * 2 = \underline{30.74 m^2}$

Eje 1

$A_1 = \frac{3.01 + 3.63}{2} * 5.15 - (3.29 - 5.25)$

$A_1 = 8.56$

$A_2 = \frac{4.21 + 5.30}{2} * 5.79 - (4.10)$

$A_2 = 23.43$

$A_3 = 4.22$

$A_T = 8.56 + 23.43 + 4.22$

$A_T = 36.21 m^2 * 2$

$A_T = 72.42 m^2$

DIN - FISDL
21 JUN. 2017
REVISADO

Pared interna baños

Longitud pared = 28.33

Area = 28.33 * 2.50 = 70.83 m²

Area enchapada = 54.48 m²

Area total = 70.83 - 54.43 + (6.05 * 2.50) + (2.40 * 2.50) + (5.21 * 2.50)

Area total = 50.55 m²

Eje 4

$A = (3.85 * 2.50) + (5.15 * 2.50)$

$A = 9.63 + 7.65$

$A_T = 17.28 m^2$

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO ... GUZMAN
ARQUITECTO
REGISTRO A-...
M.O.P. V.M.V.D.U. El Salvador, C.A.

Eje 5

$\Delta = 15.75 \times 2.86 = 45.05\ m^2$

$\Delta = 45.05\ m^2$

Columnas = $87.42\ m^2$

Cuadrado Puertas = $134.80 \times 0.15 = 10.11\ m^2$

Cuadrado Ventanas = $\frac{130.47}{2} \times 0.15 = 9.78\ m^2$

Cuadrados = $10.11 + 9.78$

Cuadrados = $19.89\ m^2$

DIN - FISDL
21 JUN. 2017
REVISADO

Vigas = $277.89\ m^2$

Pintura total

Eje A = $80.50\ m^2$
Eje D = $58.99\ m^2$
Eje B = $53.68\ m^2$
Eje C = $30.74\ m^2$
Eje 1 = $72.92\ m^2$
Baños = $50.55\ m^2$
Eje 4 = $17.28\ m^2$
Eje 5 = $45.05\ m^2$
Columnas = $87.42\ m^2$
Puertas = $10.11\ m^2$
Ventanas = $9.78\ m^2$

Vigas = 277.89

Pintura Total = 794.41

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO CARDONA GUZMÁN
ARQUITECTO
REGISTRO A-0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

Acabados

9-2-2 Texturizado c/base pasta para Lo

Area losa Densa = 91.62

Area losa Cortesia = 333.13

Area Total = 424.75 m²

Repello de Vigas

Eje A - A = 0.50 * 0.30 (2 lados) = 29.94 * (0.50 + 0.30) = 23.95m

Eje B - B = 0.60 * 0.30 (3 lados) = 22.82 * (0.60 + 0.60 + 0.30) = 34.23

Eje C - C = 0.60 * 0.30 (3 lados) = 22.82 * (0.60 + 0.60 + 0.30) = 34.23

Eje D - D = 0.50 * 0.30 (2 lados) = 22.52 * (0.50 + 0.30) = 18.02m

VS = 0.30 * 0.50 (3 lados) = 55.92 * (0.50 + 0.50 + 0.30) = 72.7

V = 0.30 * 0.50 (3 lados) = 74.27 * (0.50 + 0.50 + 0.30) = 96.5

Repello total = 277.89 m²

Afinado total = 277.89 m²

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO VASQUEZ GUZMAN
ARQUITECTO
REGISTRO No. A- 0990
M.O.P. V.M.V.D.U. El Salvador, C.A.

Repello de Cuadrados en Puertas

	Cantidad	Alto		Ancho	Alto	
P_1	1	*	(2.10 + 2.50 + 2.10)	*	2	= 13.40
P_2	1	*	(1 + 2.10 + 1)	*	2	= 8.20
P_3	5	*	(1.20 + 2.10 + 1.20)	*	2	= 45.0
P_4	3	*	(0.80 + 2.10 + 0.80)	*	2	= 22.20
P_5	3	*	(0.75 + 2.10 + 0.75)	*	2	= 21.60
P_7	1	*	(1.50 + 2.10 + 1.50)	*	2	= 10.20
P_9	1	*	(2.50 + 2.10 + 2.50)	*	2	= 19.20
						134.80

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO [illegible] GUZMÁN
ARQUITECTO
REGISTRO A-0693
M.O.P. V.M.V.D.U. El Salvador, C.A.

Repello de Cuadrados en Ventanas

	Cantidad	ancho	alto	cuadrados	
V1.	1	x (5.16 + 1.187) x	2	x 2	= 2539.
V2 =	2	x (2.40 + 1.007) x	2	x 2	= 27.76
V4 =	1	x (6 + 1.54) x	2	x 2	= 30.16
V8 =	1	x (1.96 + 1.63) x	2	x 2	= 14.36
V11 =	2	x (2.0 + 2.10) x	2	x 2	= 32.80

130.47m

9.3.3 = 130.47

Repello Total = 134.80 + 130.47

Repello total = 265.27 mts.

Afinado Total = 265.27 mts.

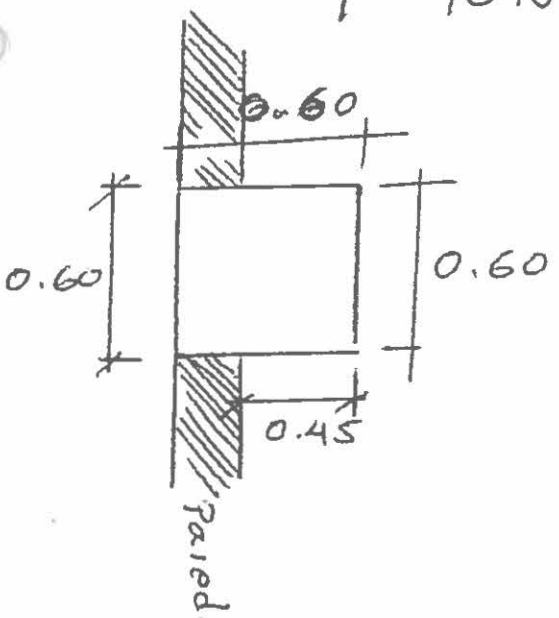
DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO ALVARADO GUZMAN
ARQUITECTO
REGISTRO A-0093
M.O.P. V.M.V.D.U. El Salvador, C.A.

Repello de Columnas

15 columnas de 0.60 x 0.60 x 3.0 mts

1er Nivel son 9 columnas a las que llegan 2 Paredes



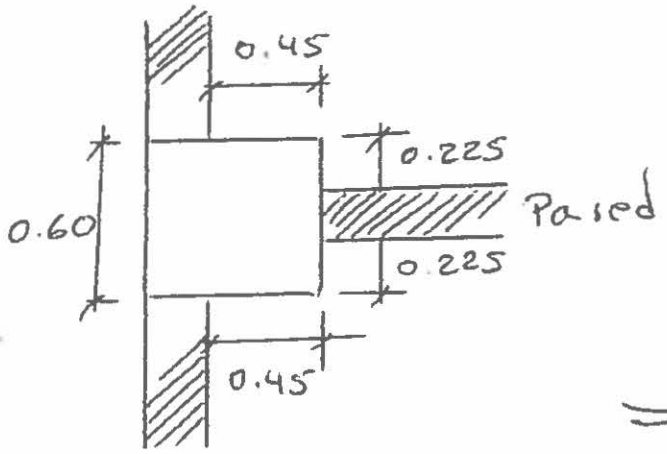
⇒ Repello = 2.10 x 2.50 = 5.25 m²

si son 9 columnas

⇒ 5.25 m² x 9 = 47.25 m²

Repello = 47.25 m²

1er Nivel



son 4 columnas a las que llegan 3 paredes

⇒ Repello = 1.95 x 2.50 = 4.88 m²

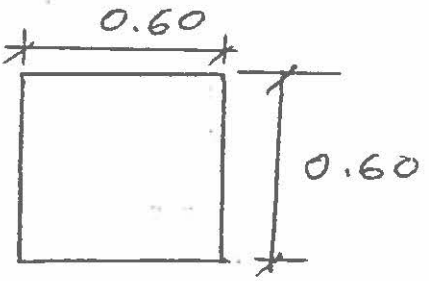
si son 4 columnas

⇒ 4.88 m² x 4 = 19.52 m²

Repello = 19.52 m²

Repello de Columnas

1er Nivel

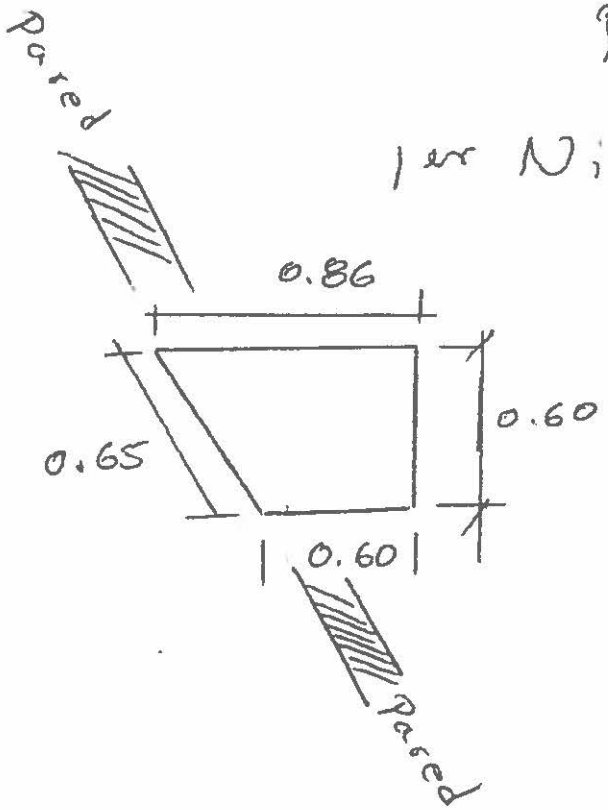


Son 2 columna a las que no llegan Paredes

$\Rightarrow 0.60 \times 4 = 2.40\ m^2$

Repello = 2.40 m x 2.50 mts x 2 col

Repello = 12.00 m^2



1er Nivel

Una columna a la que llegan 2 Paredes

$\Rightarrow 0.60 + 0.60 + 0.65 + 0.71$

$= 2.56$ mt.

Repello = 1 col x 2.50 mt x 2.56

Repello = 6.40 m^2

Repello total = 49.04 + 19.52 + 12.0 + 6.4

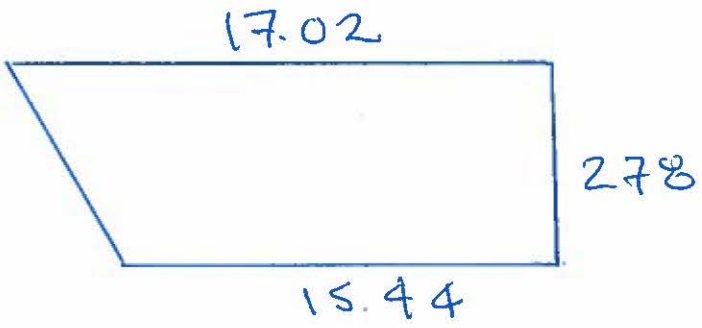
= 87.92 m^2

Afinado total = 87.92 m^2

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO CARDANO GUZMAN
ARQUITECTO
REGISTRO 0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

DIN - FISDL
21 JUN. 2017
REVISADO

9-6-1 Cielo falso fibro-cemento



$$\Delta = \frac{17.02 + 15.44}{2} * 2.78$$

$$\Delta = 45.11\ m^2$$

9.7.3 Enchape de Azulejo

Longitudes de Paredes a enchapar 1ª planta

$L = 3 + (6 \times 2) + 1.32 + 1.12 + 0.75 + 0.75 +$
$1.70 + 1.43 + (0.60 \times 2) + (0.45 \times 2) +$
$(1.20 \times 2) + (1.43 \times 4) + (1.20 \times 4) +$
$(1.93 \times 2) + (5.41 \times 3) = 45.36\ m$

h = altura de enchape = 1.20

$A = 45.36 \times 1.20$

$A = 54.43\ m^2$

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AZUCENA GUZMAN
ARQUITECTO
REGISTRO A - 0693
M.O.P. V.M.V.D.U. El Salvador, C.A.

9-8-1 Sisado de Pared

A_T = Area de Pintura - Area Columna - Area Vigas - Puertas - Ventanas

$A_T = 794.41 - 87.42 - 277.89 - 10.11 - 9.78$

$A_T = \underline{409.21 m^2}$

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMAN
ARQUITECTO
REGISTRO No. A-2993
M.O.P. V.M.V.D.U. El Salvador, C.A.

Artefactos Sanitarios

10 1 9	Inodoro IS #551 =	3 unid.
10 1 8	Mingitorio IS #307 =	2 unid
10 1 7	Lavamanos AS #401 =	4 unid
10 2 3	Lava a os acero inoxidable 1 Poceta =	1 unid
10 1 14	Inodoro P/Personas con capacidades especiales =	2 unid
10 2 17	Suministro e instalación Valvula de Control de Presión =	1 unid
10 4 1	Suministro e instalación de Grifo cuello alto =	1 uni
10 4 2	Suministro e Instalación de tubo de abasto =	12 uni
10 4 3	Suministro e instalación de Valvula de Control =	12 uni

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO ARTURO GUZMÁN
ARQUITECTO
REGISTRO A-0095
M.O.P. V.M.V.D.U. El Salvador, C.A.

DIN - FISDL
21 JUN. 2017
REVISADO

Agua Potable

12 9 11	Bomba de ½ HP con tanque de Presion y accesorio	= 1 unid.
S/codigo	Cisterna 24.30 m^3 (3x3x2.70) Paredes de Ladrillo de Barro impermeabiligado	= 1. unid
1 3 2	Trago Lineal para construccion	= 46.14 mt
14 2	Excavación a mano = 51mt x 0.20 x 0.40 =	= 4.16 m^3
15 2	Relleno compactado =	3.90 m^3
12 12	Tuberia P.V.C. ½ SC 315PSI	= 51.64 mt
10 2 1	Grifo metalico de ½	= 1 uni
10 2 25	Tee Lisa P.V.C ½	= 14 uni
12 2 94	union Lisa P.V.C. ½	= 5 uni
12 2 13	Codo Liso 90° P.V.C. ½	= 23 uni
12 2 6	adaptador hembra P.V.C. ½	= 11 uni
12 2 20	adaptador macho c/rosca P.V.C 2"	= 5 uni
10 2 17	Suministro e instalacion de Valvula de Piesion	= 12 uni

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO A 0993
M.O.P. V.M.V.D.U. El Salvador, C.A.

DIN - FISDL
21 JUN. 2017
REVISADO

Aguas lluvias

14 4 13 Canal de A.LL. cal 26 A=25cm, H=35cm. =19.58m

14 4 3 Bajada A.LL. P.V.C 4 = 6.00m

12 15 8 Tubo para desague Ø4"
5.0+2.0+4.0+11.07+19.0 = 41.07m

12 15 7 Tubo para drenaje Ø6" = 25.50m

13 6 6 Caja P/aguas lluvias = 3.0 unid

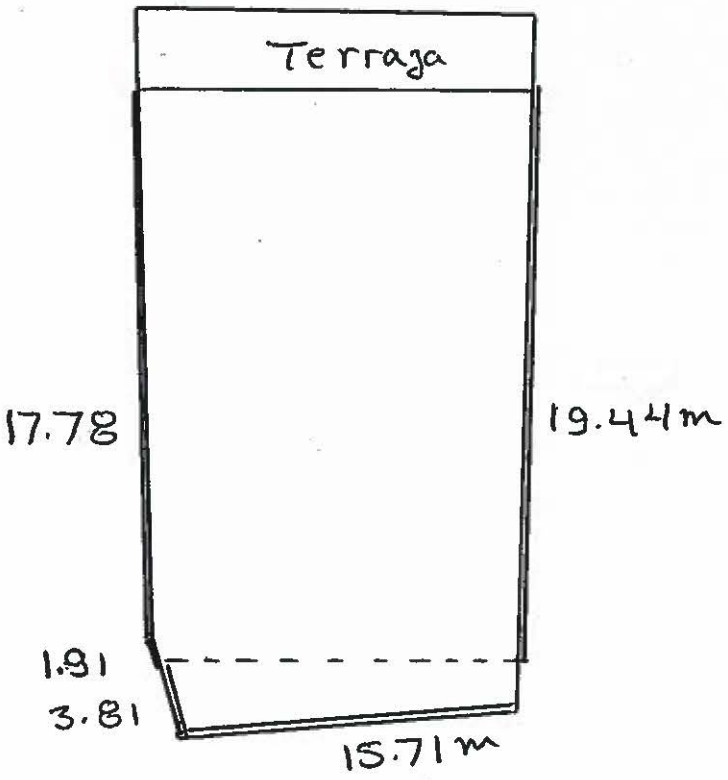
12 2 13 Codo 90° 4"= =17 unid

14 4 26 Bajada A.LL. PVC 3" 100psi c/accesorios = 3 mts.

Codo 90° 3" = = 1 unid.

Canal Para Aguas Lluvias

58.6



Longitud de Canal =

3.81 mts + 15.71 mts

Long. de Canal = 19.52 m

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO [illegible]993
M.O.P. V.M.V.D.U. El Salvador, C.A.

Aguas Negras

1 3 2	Trago Lineal para Construcción	=46.29m
1 4 2	Excavación a mano = 70 mt x 0.30m x 0.30 m	= 8.4m
1 5 2	Relleno compactado	= 6.2m³
13 1 14	Tuberia P.V.C. jc 4" 80PSI	= 48.79mt
13 3 8	YT P.V.C. 4"	= 12 un
12 3 50	Suministro e instalación de Tapon inodoro Niquelado 4"	= 2uni
13 3 57	Curva P.V.C. 4 x45 para drenaje	= 2uni
13 3 11	Sifón continuación c/registro P.V.C. 4"	7 unid
13 3 37	Curva P.V.C. de 4" x 90 jc	= 9 un

DIN - FISDL
21 JUN. 2017
REVISADO

REGISTRO NACIONAL DE ARQUITECTOS E INGENIEROS
JOSE ARMANDO AVENDAÑO GUZMÁN
ARQUITECTO
REGISTRO V-8990
M.O.P. V.M.V.D.U. El Salvador, C.A.

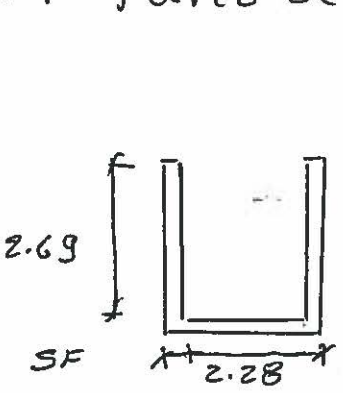
Modulo para Gradas de Entrada.

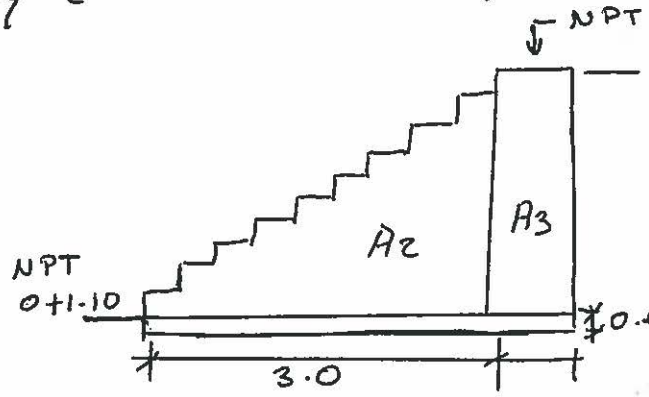
2.2.7 Solera de Fundaciones 0.30 x 0.20 m/
ref. 4#3 est #2 @ 15cm.

L = 2.41 + 2.41 + 2.47 = 7.29 mt

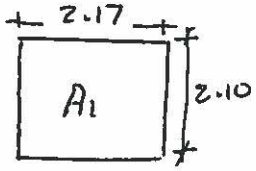
L = 7.29 mtL

3.1.1 Pared de Bloque 15cms Rv #4 @40, RH #2@4





L = 7.29 mt.

Pared 

$A_1 = 2.17 \times 2.10 = 4.56\ m^2$

$A_2 = \frac{3 \times 2.10}{2} = 3.15\ m^2$

$A_2 = A_2 \times 2\ Lados = 6.30\ m^2$

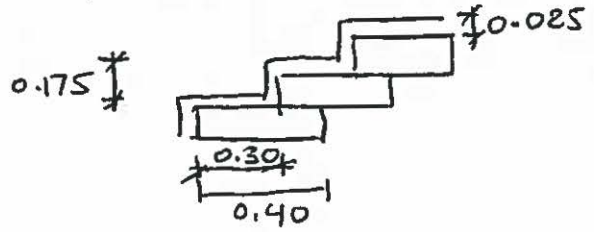
$A_3 = 1.70 \times 2.10 = 3.57\ m^2$

$A_T = A_1 + A_2 + A_3 = 14.01\ m^2$

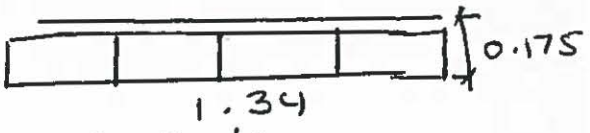
5.2.7 Gradas Forjadas con bloque de Concreto de 15cm
ancho de Grada = 2.0mts
huella = 0.30 m
contrahuella = 0.175 mt. incluye repello
= 22.48 m²

ver sig. hoja

Gradas



Grada Descanso



L = 6.48 mts

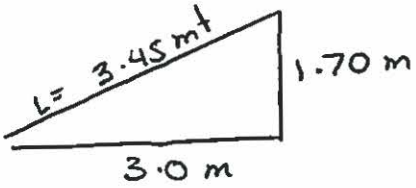
A = 1.34 x 6.48

= 8.68 m²

A = 9 Gradas x 2 Lados x 2 mts

$L = \sqrt{a^2 + b^2} = \sqrt{1.70^2 + 3.0^2}$

L = 3.45 m²



Area de Gradas = 3.45 x 2 Lados x 2 mts

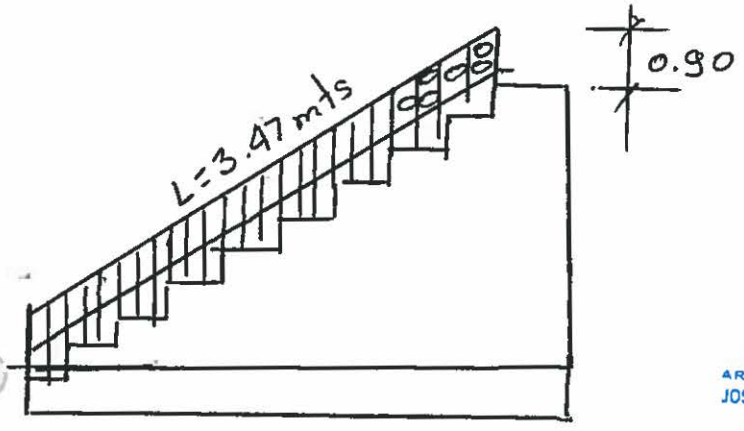
= 13.80 m²

5.2.7 Gradas Forjadas con bloque

= 8.68 m² + 13.80 m² = 22.48 m²

5.2.7 Gradas Forjadas con bloque = 22.48 m²

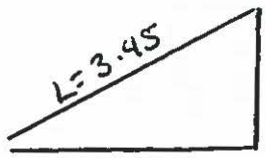
11 6 14 Barandal de Tubo 1" x 1" H=0.90 con pletin de 1 x 1/8"



Barandal = 3.47 x 2 Lado

Barandal = 6.94 ≃ 7.0 mt

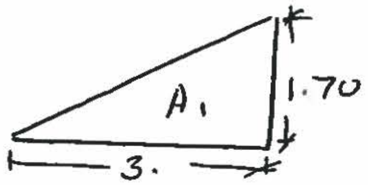
5.5.12 Rampla de Concreto de alto trafico con color integral e=10cm



A = L x ancho

A = 3.45 x 2.17 = 7.48 m² ✓

152 Relleno compactado suelo cemento 20:1



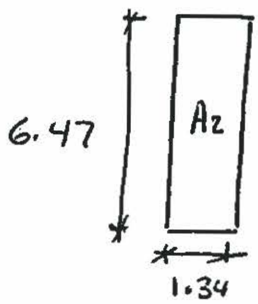
L= 6.47m

$A_1 = \frac{1.70 \times 2}{2} = 2.55\ m^2$

$V_1 = L \times A_1 = 2.55 \times 6.47\ m^3$

$V_1 = 16.49\ m^3$

en area de descans



$A_2 = 1.34 \times 6.47\ m^2$

$A_2 = 8.66\ m^2$

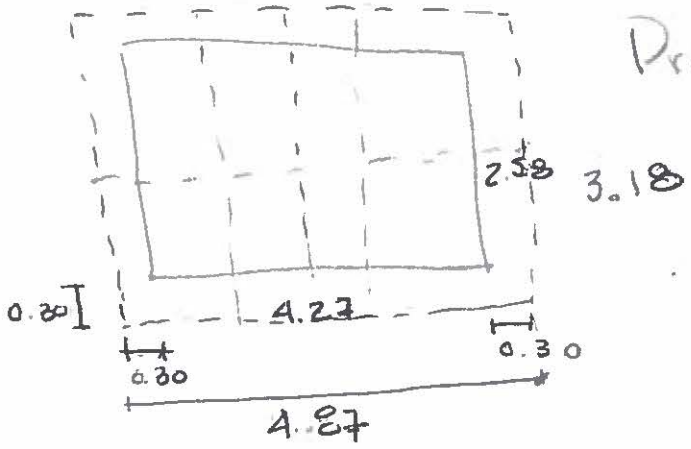
$V_2 = 8.66\ m^2 \times 1.70\ m$

$V_2 = 14.72\ m^3$

V_T de relleno $= 16.49\ m^3 + 14.72\ m^3$

$= 31.23\ m^3$ ✓

Protección de Gradas



Pared

$P_1 \left(\frac{0.40+0.20}{2} \times 4.27\right) \times 2 = 2.56 m^2$

P_2 $0.40 \times 2.58 = 1.03$

P_3 $0.20 \times 2.58 = 0.52$

$P = P_1 + P_2 + P_3$

$P = 2.56 + 1.03 + 0.52$

$P = 4.11 m^2$

Cepo

$2.58 \times 2 = 5.16 ml.$

Techo

$4.87 \times 3.18 = 15.49 m^2$

Cielo falso

$4.27 \times 2.58 = 11.02 m^2$

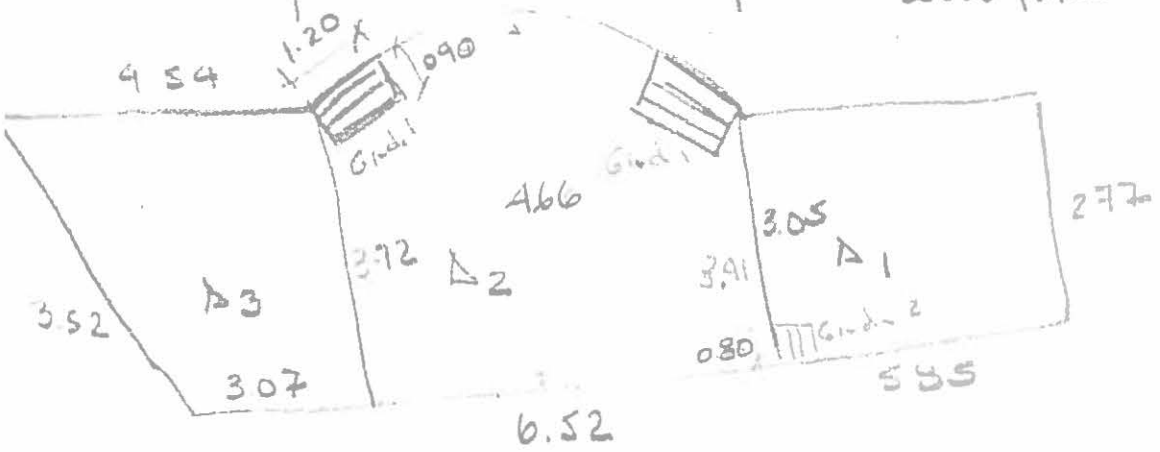
Polin C

$(3.18 \times 2) + 4.87 =$

$11.23 ml.$

Escenario

NOTA: El restante de paredes ya fueron incluidas en el Rubro Paredes



Relleno Compactado

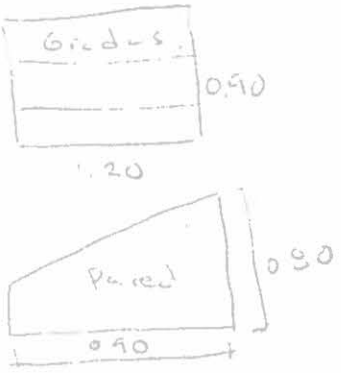
$$\Delta_1 = \frac{2.72 + 3.05}{2} \times 5.55 = 16.88$$

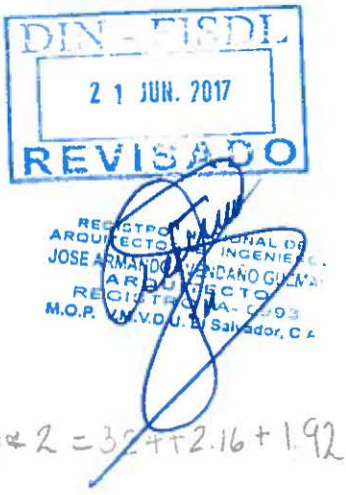
$$\Delta_2 = \frac{(3.72 + 4.66 + 3.91)}{3} \times 6.52 = 25.62$$

$$\Delta_3 = \frac{4.54 + 3.07}{2} \times 3.52 = 13.39$$

$$\Delta = (16.88 + 25.62 + 13.39) \times 0.90$$

$$\Delta_T = 22.37 m^3$$





Pared

$$(4.05 \times 0.80) + \left(\frac{0.70 + 0.80}{2} \times 0.90\right) \times 4 + (1.20 \times 0.80) \times 2 = 3.2 + 2.16 + 1.92 = 7.32$$

Soleras

$(0.90 \times 4) + (1.20 \times 2) = 3.60 + 2.40 = 6.0$ mts (el Resto de soleras se incluye en el Rubro soleras)

Grada

$4 \times 1.20 \times 0.30 = 1.44 m^2$ + $2 \times 0.80 \times 0.30 = 0.48$ $1.92 m^2$

Dise

$4 \times 1.20 \times 0.30 = 1.44 m^2$ + $2 \times 0.80 \times 0.30 = 0.48 = 1.92 m^2$

Proyección 2ª Planta

Hierro para paredes, gradas y Columnas.

Paredes

Eje 1 = 14.88

Fachada = 9.37+4.72 = 14.09

Eje 4 = 17.06

Eje D = 5.31

oficina = 5.87+5.77+4.12 = 15.76

Sanitarios + oficina = 3.89+3.32+3.63+3.19+8.75+4.51+1.20+1.69+5.85+2.70+1.56 = 40.23

Fachada lateral = 19.14

Eje A = 21.67

Longitud Total = 14.88+14.09+17.06+5.31+15.76+40.23+19.14+21.67 = 148.14 ml.

No 5/8 = 148.14/0.60 = 247 bastones.

247/6 x 1.1 = 46 varillas de 5/8"

Columnas

8 x 10 = 80

No 1" = 80 x 2.15/6 x 1.1 = 33 varillas de 1"

Gradas

ϕ 1/2 = 4+14+14/6 = 6 varillas

ϕ 3/8 = 7+1 = 7/6 x 1.1 = 2 varillas.