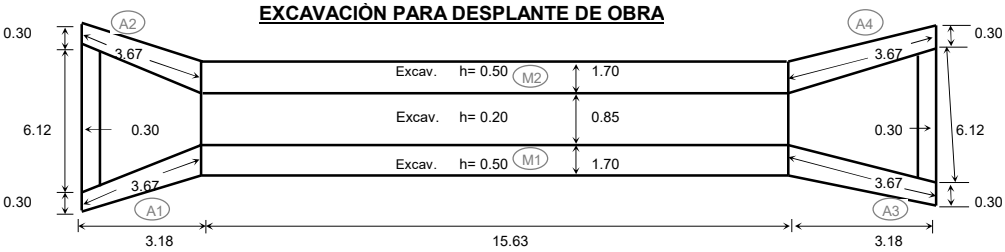


CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA : DE 2.45 X 1.85 X 15.63
ESTACION DE OBRA : 215+933.3 ESVIAJE NORMAL EN TANGENTE

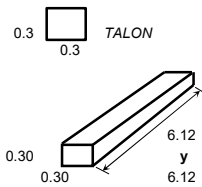
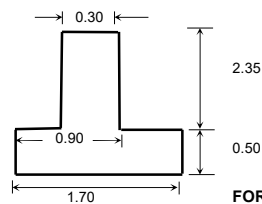


EN MUROS =		26.58	M3	
VM 1	=	15.63	X	1.70
VM 2	=	15.63	X	1.70
EN ALEROS =		6.36	M3	
VA 1	=	((1.70	+	0.30)
VA 2	=	((1.70	+	0.30)
VA 3	=	((1.70	+	0.30)
VA 4	=	((1.70	+	0.30)
EN PLANTILLA =		7.10	M3	
VM	=	15.63	X	0.85
VI	=	((6.12	+	0.85
VD	=	((6.12	+	0.85
EN DENTELLONES =		1.10	M3	
VI	=	6.12	X	0.30
VD	=	6.12	X	0.30
VOLUMEN TOTAL =		26.58	+	6.36
VOLUMEN TOTAL		=		41 M3

CAMINO: MONTERREY - COLOMBIA
 TRAMO: LA GLORIA - COLOMBIA
 ALCANTARILLA DE LOSA : DE 2.45 X 1.85 X 15.63
 ESTACION DE OBRA : 215+933.3 ESVAIJE NORMAL EN TANGENTE

CONCRETO SIMPLE DE F'c = 200 KG/CM2

EN MUROS, ALEROS Y DENTELLONES

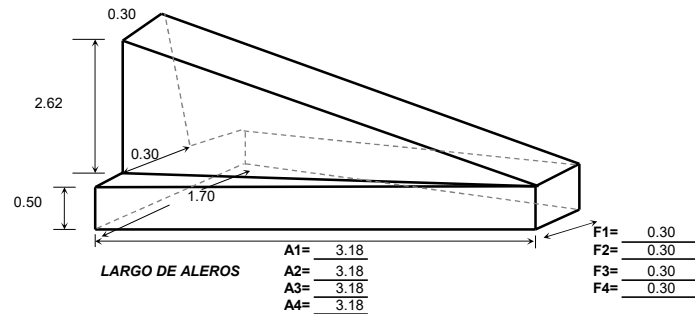


FORMULAS EMPLEADAS

CUBO: $V = L \times L \times L$

RECTANGULO: $V = (b \times h) \times H$

TRIANGULO: $V = (b \times h) / 2 \times H$



EN MUROS = 51.42 M3

$$\begin{aligned} VM &= ((1.70 \times 0.50) + (2.35 \times 0.30)) \times 15.63 \times 2.00 = 48.61 \text{ M3} \\ VTAL &= 0.30 \times 0.30 \times 2.00 = 2.81 \text{ M3} \end{aligned}$$

EN ALEROS = 11.36 M3

$$\begin{aligned} VA1 &= (((1.70 + 0.30) / 2.00) \times 3.18) \times 0.50 + ((3.18 \times 2.62) / 2.00) \times ((0.30 + 0.30 + 0.30) / 3.00) = 2.84 \text{ M3} \\ VA2 &= (((1.70 + 0.30) / 2.00) \times 3.18) \times 0.50 + ((3.18 \times 2.62) / 2.00) \times ((0.30 + 0.30 + 0.30) / 3.00) = 2.84 \text{ M3} \\ VA3 &= (((1.70 + 0.30) / 2.00) \times 3.18) \times 0.50 + ((3.18 \times 2.62) / 2.00) \times ((0.30 + 0.30 + 0.30) / 3.00) = 2.84 \text{ M3} \\ VA4 &= (((1.70 + 0.30) / 2.00) \times 3.18) \times 0.50 + ((3.18 \times 2.62) / 2.00) \times ((0.30 + 0.30 + 0.30) / 3.00) = 2.84 \text{ M3} \end{aligned}$$

EN DENTELLONES = 1.10 M3

$$\begin{aligned} VI &= 0.30 \times 0.30 \times 6.12 = 0.55 \text{ M3} \\ VD &= 0.30 \times 0.30 \times 6.12 = 0.55 \text{ M3} \end{aligned}$$

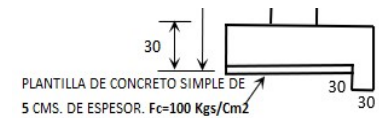
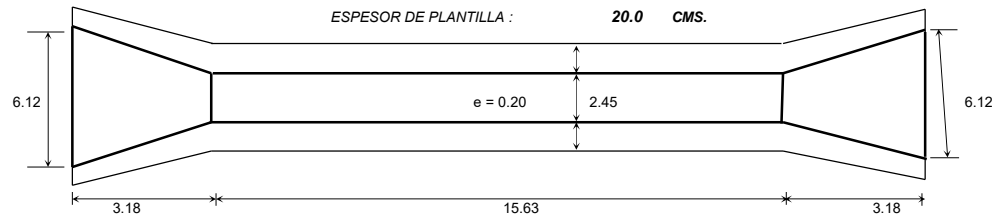
$$\text{VOLUMEN TOTAL} = 51.42 + 11.36 + 1.10$$

$$\text{VOLUMEN TOTAL} = 63.62 \text{ M3}$$

CON DESCUENTO DE ACERO

CAMINO: MONTERREY - COLOMBIA
 TRAMO: LA GLORIA - COLOMBIA
 ALCANTARILLA DE LOSA : DE 2.45 X 1.85 X 15.63
 ESTACION DE OBRA : 215+933.3 ESVIAJE NORMAL EN TANGENTE

CONCRETO SIMPLE DE $F_c = 100 \text{ KGS/CM}^2$

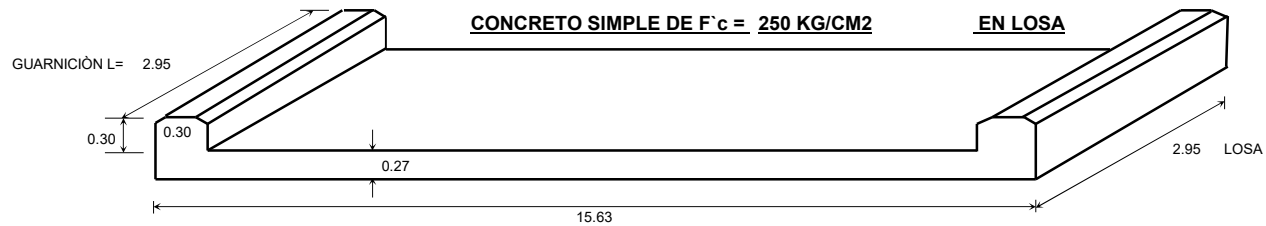


EN PLANTILLA = 16.90 M3										
VAM	=	15.63	X	2.45	X	0.20	=	7.66	M3	
VPLA	=	21.99	X	1.70	X	0.05	X	2.00	=	3.74 M3
VA1	=	((6.12	+	2.45)	/	2.00)	X	3.18)	X	0.20 = 2.73 M3
VA2	=	((6.12	+	2.45)	/	2.00)	X	3.18)	X	0.20 = 2.73 M3
VOLUMEN TOTAL = 7.66 + 3.74 + 2.73 + 2.73										
VOLUMEN TOTAL = 16.90 M3										

CAMINO: MONTERREY - COLOMBIA
 TRAMO: LA GLORIA - COLOMBIA

ALCANTARILLA DE LOSA :
 ESTACION DE OBRA : 215+933.3

DE 2.45 X 1.85 X 15.63
 ESVAJE NORMAL EN TANGENTE
 CONCRETO SIMPLE DE F'c = 250 KG/CM2 EN LOSA



EN LOSA = 12.45 M3

V = 15.63 X 2.95 X 0.27 = 12.45 M3

EN GUARNICIONES = 0.53 M3

V = 0.30 X 0.30 X 2.95 X 2.00 = 0.53 M3

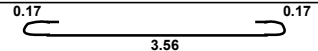
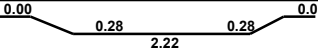
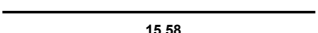
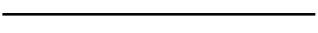
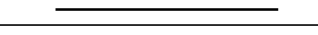
VOLUMEN TOTAL = 12.45 + 0.53

VOLUMEN TOTAL = 12.98 M3 - 0.16 = 12.83 M3

CON DESCUENTO DE ACERO

CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA : DE 2.45 X 1.85 X 15.63
ESTACION DE OBRA : 215+933.3 ESVAJE NORMAL EN TANGENTE

ACERO DE REFUERZO PARA LOSA

LISTA DE VARILLAS Y PESOS						
DESIGNACION	NUMERO	DIAMETRO	CROQUIS	LONGITUD	ESPACIO	PESO (KG)
VARILLAS " A "	74	6		3.90	0.140 Y 0.280	656
VARILLAS " B "	37	6		2.78	0.420	232
VARILLAS " C "	9	6		15.58	0.415	317
VARILLAS " D "	0	0		0.00	0.000	0
VARILLAS " E "	0	0		0.00	0.000	0
VARILLAS " F "	4	4		2.90	0.100	12

VARILLAS	"A"	74	X	3.90	X	2.260	=	656	KGS.
VARILLAS	"B"	37	X	2.78	X	2.260	=	232	KGS.
VARILLAS	"C"	9	X	15.58	X	2.260	=	317	KGS.
VARILLAS	"D"	0	X	0.00	X	0.000	=	0	KGS.
VARILLAS	"E"	0	X	0.00	X	0.000	=	0	KGS.
VARILLAS	"F"	4	X	2.90	X	1.000	=	12	KGS.

VARILLAS	"A"	656	KGS.
VARILLAS	"B"	232	KGS.
VARILLAS	"C"	317	KGS.
VARILLAS	"D"	0	KGS.
VARILLAS	"E"	0	KGS.
VARILLAS	"F"	12	KGS.

PESO TOTAL 1,217 KGS.

CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA : DE 2.45 X 1.85 X 15.63
ESTACION DE OBRA : 215+933.3 ES VIAJE NORMAL EN TANGENTE

DESCUENTO DE ACERO DE REFUERZO A CONCRETO SIMPLE EN LOSA DE 250 KG/CM2

VARILLAS	"A"	74	X	3.90	X	2.260	=	656	KGS.
VARILLAS	"B"	37	X	2.78	X	2.260	=	232	KGS.
VARILLAS	"C"	9	X	15.58	X	2.260	=	317	KGS.
VARILLAS	"D"	0	X	0.00	X	0.000	=	0	KGS.
VARILLAS	"E"	0	X	0.00	X	0.000	=	0	KGS.
VARILLAS	"F"	4	X	2.90	X	1.000	=	12	KGS.

VARILLAS	"A"	656	KGS.
VARILLAS	"B"	232	KGS.
VARILLAS	"C"	317	KGS.
VARILLAS	"D"	0	KGS.
VARILLAS	"E"	0	KGS.
VARILLAS	"F"	12	KGS.

PESO TOTAL 1,217 KGS.

Tipo de varillas	Diametro	Area de Acero en (m2)	Numero de Varillas	Longitud (m)	Volumen (m3)
A	6	0.000287	74	3.90	0.08
B	6	0.000287	37	2.78	0.03
C	6	0.000287	9	15.58	0.04
D	0	0.000000	0	0.00	0.00
E	0	0.000000	0	0.00	0.00
F	4	0.000127	4	2.90	0.00

0.16 POR LOSA

VOLUMEN DE ACERO EN MUROS 0.28 EN MUROS

VOLUMEN TOTAL DE DESCUENTO EN LOSA Y MUROS = 0.44 M3

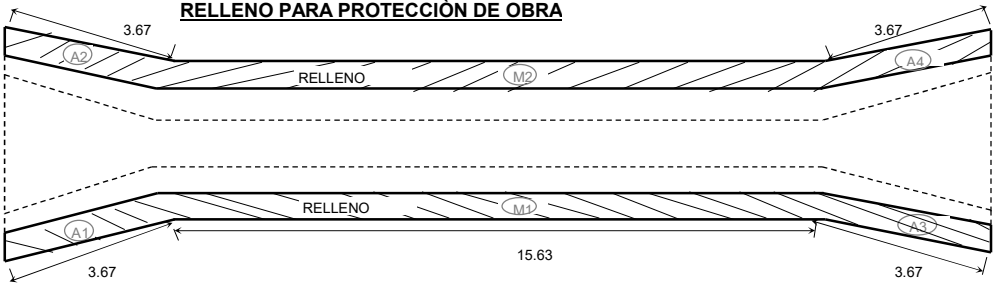
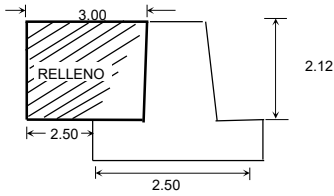
VAR. No.	DIAM.	PLGS.	AREA (CM2)	PESO (KG)
2.5	0.79	5/16"	0.49	0.384
3	0.95	3/8"	0.71	0.560
4	1.27	1/2"	1.27	1.000
5	1.59	5/8"	1.99	1.570
6	1.91	3/4"	2.87	2.260
7	2.22	7/8"	3.87	3.070
8	2.54	1"	5.07	4.000
9	2.86	1 1/8"	6.42	5.100
10	3.18	1 1/4"	7.94	6.300
11	3.49	1 3/8"	9.56	7.600
12	3.81	1 1/2"	11.40	9.000

DENSIDAD DEL ACERO
7,860 KGS/M3

CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA :
ESTACION DE OBRA :

DE 2.45 X 1.85 X 15.63
ESVIAJE NORMAL EN TANGENTE

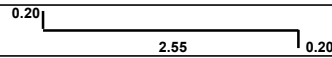
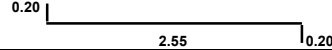
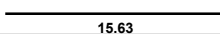
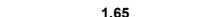
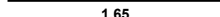
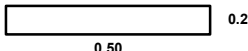
RELLENO PARA PROTECCIÓN DE OBRA



EN MUROS =		182.25	M3
VM 1y2	=	((2.50 + 3.00) / 2.00) X 2.12 X (15.63) X (2.00)	= 182.25 M3
EN ALEROS =		41.52	M3
VA1	=	((3.67 X 2.12) / 2.00) X (3.00 + 2.50 + 2.50) / 3.00	= 10.38 M3
VA2	=	((3.67 X 2.12) / 2.00) X (3.00 + 2.50 + 2.50) / 3.00	= 10.38 M3
VA3	=	((3.67 X 2.12) / 2.00) X (3.00 + 2.50 + 2.50) / 3.00	= 10.38 M3
VA4	=	((3.67 X 2.12) / 2.00) X (3.00 + 2.50 + 2.50) / 3.00	= 10.38 M3
VOLUMEN TOTAL =		182.25 + 41.52	
VOLUMEN TOTAL		= 224	M3

CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA : DE 2.45 X 1.85 X 15.63
ESTACION DE OBRA : 215+933.3 ESVAJE NORMAL EN TANGENTE

ACERO DE REFUERZO EN MURO

LISTA DE VARILLAS Y PESOS						
DESIGNACION	NUMERO	DIAMETRO	CROQUIS	LONGITUD	ESPACIO	PESO (KG)
VARILLAS " A "	79	5		2.95	0.200	366.00
VARILLAS " B "	64	3		2.95	0.250	106.00
VARILLAS " C "	22	3		15.63	0.250	193.00
VARILLAS " D "	64	4		1.65	0.250	105.00
VARILLAS " E "	79	4		1.65	0.200	130
VARILLAS " F "	17	3		15.63	0.250	149
VARILLAS " G "	79	3		1.40	0.200	62

VARILLAS	"A"	79	X	2.95	X	1.57	=	366	KGS.
VARILLAS	"B"	64	X	2.95	X	0.56	=	106	KGS.
VARILLAS	"C"	22	X	15.63	X	0.56	=	193	KGS.
VARILLAS	"D"	64	X	1.65	X	1.00	=	105	KGS.
VARILLAS	"E"	79	X	1.65	X	1.00	=	130	KGS.
VARILLAS	"F"	17	X	15.63	X	0.56	=	149	KGS.
VARILLAS	"G"	79	X	1.40	X	0.56	=	62	KGS.

VARILLAS	"A"	366	KGS.
VARILLAS	"B"	106	KGS.
VARILLAS	"C"	193	KGS.
VARILLAS	"D"	105	KGS.
VARILLAS	"E"	130	KGS.
VARILLAS	"F"	149	KGS.
VARILLAS	"F"	62	KGS.

PESO TOTAL 1,111 X 2 = 2,222 KGS.