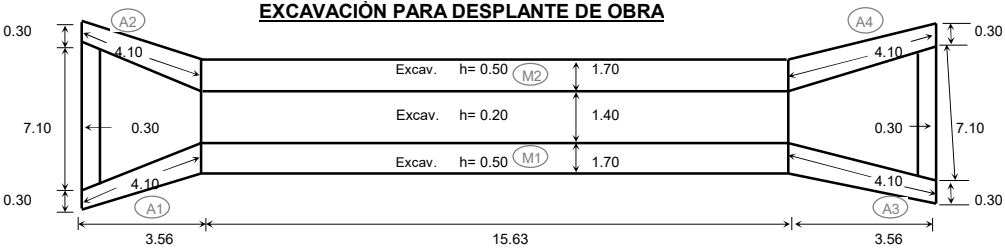


CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA : DE 3.00 X 2.10 X 15.63
ESTACION DE OBRA : 220+383.40 ES VIAJE NORMAL EN TANGENTE

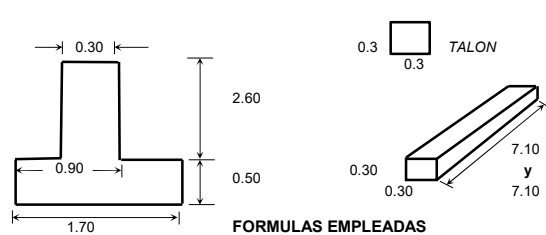


EN MUROS =		26.58		M3									
VM 1	=	15.63	X	1.70	X	0.50	=	13.29	M3				
VM2	=	15.63	X	1.70	X	0.50	=	13.29	M3				
EN ALEROS =		7.12		M3									
VA1	=	((1.70	+	0.30)	/	2.00)	X	3.56)	X	0.50	=	1.78	M3
VA2	=	((1.70	+	0.30)	/	2.00)	X	3.56)	X	0.50	=	1.78	M3
VA3	=	((1.70	+	0.30)	/	2.00)	X	3.56)	X	0.50	=	1.78	M3
VA4	=	((1.70	+	0.30)	/	2.00)	X	3.56)	X	0.50	=	1.78	M3
EN PLANTILLA =		10.42		M3									
VM	=	15.63	X	1.40	X	0.20	=	4.38	M3				
VI	=	((7.10	+	1.40	/	2.00)	X	3.56)	X	0.20	=	3.02	M3
VD	=	((7.10	+	1.40	/	2.00)	X	3.56)	X	0.20	=	3.02	M3
EN DENTELLONES =		1.28		M3									
VI	=	7.10	X	0.30	X	0.30	=	0.64	M3				
VD	=	7.10	X	0.30	X	0.30	=	0.64	M3				
VOLUMEN TOTAL =		26.58		+	7.12	+	10.42	+	1.28				
VOLUMEN TOTAL				=	45	M3							

CAMINO: MONTERREY - COLOMBIA
 TRAMO: LA GLORIA - COLOMBIA
 ALCANTARILLA DE LOSA : DE 3.00 X 2.10 X 15.63
 ESTACION DE OBRA : 220+383.40 ESVIAJE NORMAL EN TANGENTE

CONCRETO SIMPLE DE F'c = 200 KG/CM2

EN MUROS, ALEROS Y DENTELLONES

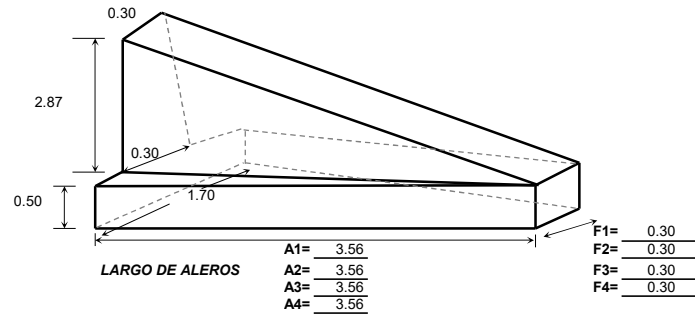


FORMULAS EMPLEADAS

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

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

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



LARGO DE ALEROS

A1= 3.56
 A2= 3.56
 A3= 3.56
 A4= 3.56

F1= 0.30
 F2= 0.30
 F3= 0.30
 F4= 0.30

EN MUROS = 53.77 M3

VM = ((1.70 X 0.50) + (2.60 X 0.30)) X 15.63 X 2.00 = 50.95 M3
 VTAL = 0.30 X 0.30 X 15.63 X 2.00 = 2.81 M3

EN ALEROS = 13.24 M3

VA1 = (((1.70 + 0.30) / 2.00) X 3.56) X 0.50 + ((3.56 X 2.87) / 2.00) X ((0.30 + 0.30 + 0.30) / 3.00) = 3.31 M3
 VA2 = (((1.70 + 0.30) / 2.00) X 3.56) X 0.50 + ((3.56 X 2.87) / 2.00) X ((0.30 + 0.30 + 0.30) / 3.00) = 3.31 M3
 VA3 = (((1.70 + 0.30) / 2.00) X 3.56) X 0.50 + ((3.56 X 2.87) / 2.00) X ((0.30 + 0.30 + 0.30) / 3.00) = 3.31 M3
 VA4 = (((1.70 + 0.30) / 2.00) X 3.56) X 0.50 + ((3.56 X 2.87) / 2.00) X ((0.30 + 0.30 + 0.30) / 3.00) = 3.31 M3

EN DENTELLONES = 1.28 M3

VI = 0.30 X 0.30 X 7.10 = 0.64 M3
 VD = 0.30 X 0.30 X 7.10 = 0.64 M3

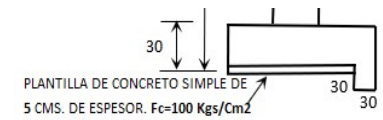
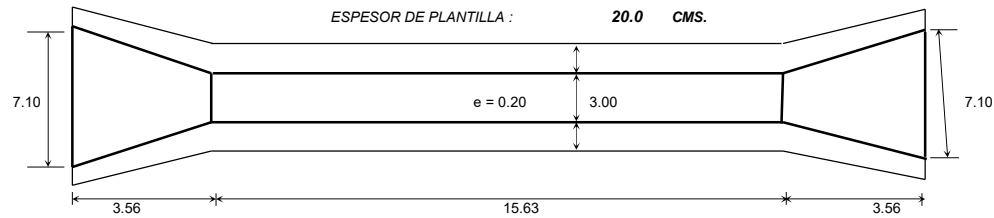
VOLUMEN TOTAL = 53.77 + 13.24 + 1.28

VOLUMEN TOTAL = 68.00 M3

CON DESCUENTO DE ACERO

CAMINO: MONTERREY - COLOMBIA
 TRAMO: LA GLORIA - COLOMBIA
 ALCANTARILLA DE LOSA : DE 3.00 X 2.10 X 15.63
 ESTACION DE OBRA : 7220+383.40 ESVIAJE NORMAL EN TANGENTE

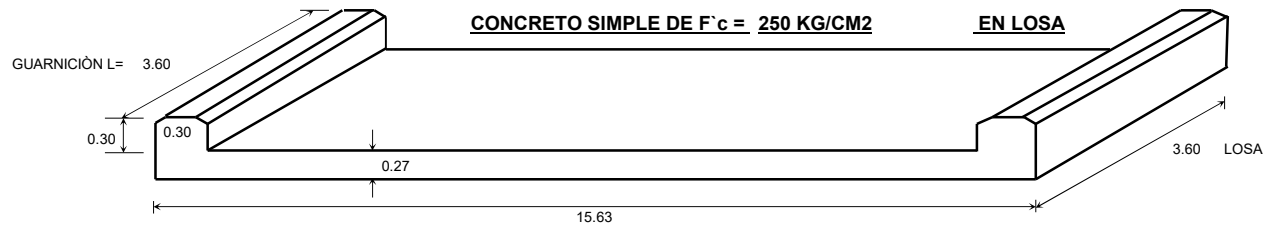
CONCRETO SIMPLE DE $F_c = 100 \text{ KGS/CM}^2$



EN PLANTILLA = 20.40 M3												
VAM	=	15.63	X	3.00	X	0.20	=	9.38	M3			
VPLA	=	22.74	X	1.70	X	0.05	X	2.00	=	3.87	M3	
VA1	=	((7.10	+	3.00)	/	2.00)	X	3.56)	X	0.20	=	3.59 M3
VA2	=	((7.10	+	3.00)	/	2.00)	X	3.56)	X	0.20	=	3.59 M3
VOLUMEN TOTAL = 9.38 + 3.87 + 3.59 + 3.59												
VOLUMEN TOTAL = 20.40 M3												

CAMINO: MONTERREY - COLOMBIA
 TRAMO: LA GLORIA - COLOMBIA

ALCANTARILLA DE LOSA : DE 3.00 X 2.10 X 15.63
 ESTACION DE OBRA : 220+383.40 ESVAJE NORMAL EN TANGENTE



EN LOSA = 15.19 M3									
V	=	15.63	X	3.60	X	0.27	=	15.19	M3

EN GUARNICIONES = 0.65 M3									
V	=	0.30	X	0.30	X	3.60	X	2.00	= 0.65 M3

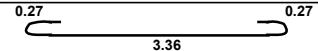
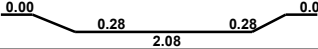
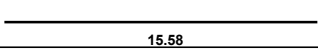
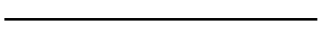
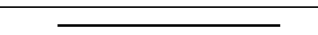
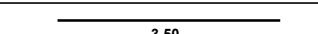
VOLUMEN TOTAL = 15.19 + 0.65

VOLUMEN TOTAL	=	15.84 M3	-	0.16	=	15.68 M3
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CON DESCUENTO DE ACERO

CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA : DE 3.00 X 2.10 X 15.63
ESTACION DE OBRA : 220+383.40 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		2.64	0.420	221
VARILLAS " C "	11	6		15.58	0.415	387
VARILLAS " D "	0	0		0.00	0.000	0
VARILLAS " E "	0	0		0.00	0.000	0
VARILLAS " F "	4	4		3.50	0.100	14

VARILLAS	"A"	74	X	3.90	X	2.260	=	656	KGS.
VARILLAS	"B"	37	X	2.64	X	2.260	=	221	KGS.
VARILLAS	"C"	11	X	15.58	X	2.260	=	387	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	3.50	X	1.000	=	14	KGS.

VARILLAS	"A"	656	KGS.
VARILLAS	"B"	221	KGS.
VARILLAS	"C"	387	KGS.
VARILLAS	"D"	0	KGS.
VARILLAS	"E"	0	KGS.
VARILLAS	"F"	14	KGS.

PESO TOTAL	1,278	KGS.
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CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA : DE 3.00 X 2.10 X 15.63
ESTACION DE OBRA : 220+383.40 ESVIAJE 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	2.64	X	2.260	=	221	KGS.
VARILLAS	"C"	11	X	15.58	X	2.260	=	387	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	3.50	X	1.000	=	14	KGS.

VARILLAS	"A"	656	KGS.
VARILLAS	"B"	221	KGS.
VARILLAS	"C"	387	KGS.
VARILLAS	"D"	0	KGS.
VARILLAS	"E"	0	KGS.
VARILLAS	"F"	14	KGS.

PESO TOTAL 1,278 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	2.64	0.03
C	6	0.000287	11	15.58	0.05
D	0	0.000000	0	0.00	0.00
E	0	0.000000	0	0.00	0.00
F	4	0.000127	4	3.50	0.00

0.16 POR LOSA

VOLUMEN DE ACERO EN MUROS 0.30 EN MUROS

VOLUMEN TOTAL DE DESCUENTO EN LOSA Y MUROS = 0.46 M3

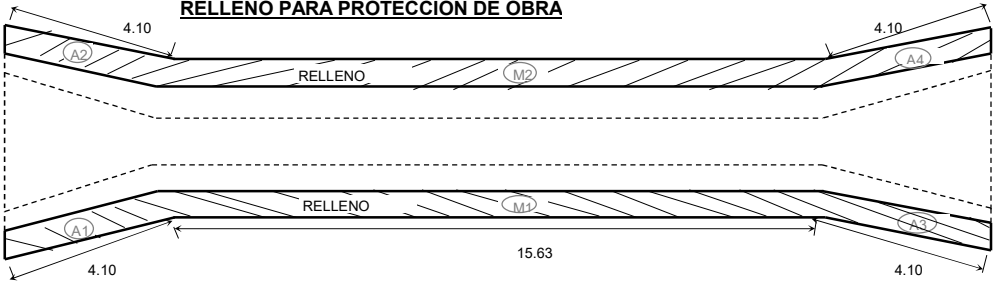
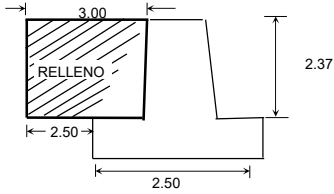
VAR. No.	DIAM.	PLGS.	AREA (CM2)	PESO (KG)
2.5	0.79	5/16"	0.49	0.384
3	0.95	3/8"	0.71	0.560
4	1.27	1/2"	1.27	1.000
5	1.59	5/8"	1.99	1.570
6	1.91	3/4"	2.87	2.260
7	2.22	7/8"	3.87	3.070
8	2.54	1"	5.07	4.000
9	2.86	1 1/8"	6.42	5.100
10	3.18	1 1/4"	7.94	6.300
11	3.49	1 3/8"	9.56	7.600
12	3.81	1 1/2"	11.40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

DENSIDAD DEL ACERO
7,860 KGS/M3

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

DE 3.00 X 2.10 X 15.63
ESVIAJE NORMAL EN TANGENTE

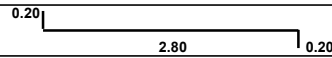
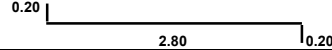
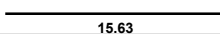
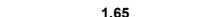
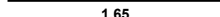
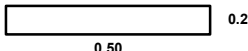
RELLENO PARA PROTECCIÓN DE OBRA



EN MUROS = 203.74 M3													
VM 1y2	=	((	(2.50	+	3.00)	/	2.00)	X	2.37)	X	(15.63)	X	(2.00) = 203.74 M3
EN ALEROS = 51.89 M3													
VA1	=	((	(4.10	X	2.37)	/	2.00)	X	(3.00	+	2.50	+	2.50) / 3.00) = 12.97 M3
VA2	=	((	(4.10	X	2.37)	/	2.00)	X	(3.00	+	2.50	+	2.50) / 3.00) = 12.97 M3
VA3	=	((	(4.10	X	2.37)	/	2.00)	X	(3.00	+	2.50	+	2.50) / 3.00) = 12.97 M3
VA4	=	((	(4.10	X	2.37)	/	2.00)	X	(3.00	+	2.50	+	2.50) / 3.00) = 12.97 M3
VOLUMEN TOTAL = 203.74 + 51.89													
VOLUMEN TOTAL = 256 M3													

CAMINO: MONTERREY - COLOMBIA
TRAMO: LA GLORIA - COLOMBIA
ALCANTARILLA DE LOSA : DE 3.00 X 2.10 X 15.63
ESTACION DE OBRA : 220+383.40 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		3.20	0.200	397.00
VARILLAS " B "	64	3		3.20	0.250	115.00
VARILLAS " C "	24	3		15.63	0.250	210.00
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	3.20	X	1.57	=	397	KGS.
VARILLAS	"B"	64	X	3.20	X	0.56	=	115	KGS.
VARILLAS	"C"	24	X	15.63	X	0.56	=	210	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"	397	KGS.
VARILLAS	"B"	115	KGS.
VARILLAS	"C"	210	KGS.
VARILLAS	"D"	105	KGS.
VARILLAS	"E"	130	KGS.
VARILLAS	"F"	149	KGS.
VARILLAS	"F"	62	KGS.

PESO TOTAL 1,168 X 2 = 2,336 KGS.