

**SIMONGAN
CONTROL OFFICE VOLUME CALCULATION**

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
	0.30	0.30	7.40	4.00	2.66	
	0.15	0.25	7.10	1.00	0.27	
	0.15	0.15	7.10	3.00	0.48	
	0.15	0.15	3.60	16.00	1.30	
	0.15	0.20	7.50	9.00	2.03	
	0.25	0.50	7.50	4.00	3.75	
	0.20	0.30	7.50	4.00	1.80	
	0.15	0.20	3.75	1.00	0.11	
	0.15	0.20	7.50	1.00	0.23	
	0.15	0.20	2.00	11.00	0.41	
	0.15	0.20	3.75	3.00	0.21	
	0.15	0.20	1.50	2.00	0.06	
	0.15	0.20	1.75	5.00	0.26	
	0.15	0.20	1.00	2.00	0.06	
	0.20	0.30	7.50	1.00	0.45	
	0.25	0.50	7.50	1.00	0.94	
	0.15	0.20	2.00	7.00	0.42	
	0.15	0.20	3.00	5.00	0.45	
	0.15	0.20	1.50	6.00	0.27	
	0.15	0.20	1.00	1.00	0.03	
	0.20	0.30	6.50	1.00	0.39	
	9.25	0.20	1.25	1.00	2.31	
	0.60	0.25	1.25	1.00	0.19	
	0.20	1.25	20.00	1.00	5.00	
	0.30	0.30	1.90	4.00	0.68	
	0.90	0.25	1.50	4.00	1.35	26.10

Name of work	Diameter (mm)	Each	Lenth (M)	Qty.	Weight (Kg/m)	Total (Kg)
STEEL BAR	16.00	8.00	7.50	4.00	1.58	379.44
	16.00	4.00	7.20	1.00	1.58	45.53
	16.00	11.00	7.60	4.00	1.58	528.68
	16.00	6.00	7.60	4.00	1.58	288.37
	16.00	5.00	7.60	1.00	1.58	60.08
	16.00	11.00	7.60	1.00	1.58	132.17
	16.00	5.00	6.60	1.00	1.58	52.17
	25.00	2.00	0.80	1.00	3.86	6.18
	25.00	2.00	0.80	1.00	3.86	6.18
	16.00	1.00	9.14	7.00	1.58	101.15
	16.00	1.00	8.20	7.00	1.58	90.75
	16.00	8.00	2.35	4.00	1.58	118.89
	16.00	11.00	3.24	4.00	1.58	225.38
	16.00	11.00	3.24	4.00	1.58	225.38
						2,260.35

Name of work	Diameter (mm)	Each	Lenth (M)	Qty.	Weight (Kg/m)	Total (Kg)
STEEL BAR	8.00	50.00	1.05	4.00	0.39	82.84
	8.00	48.00	0.65	1.00	0.39	12.31
	12.00	4.00	7.20	3.00	0.89	76.69
	8.00	48.00	0.45	3.00	0.39	25.56
	12.00	4.00	3.70	16.00	0.89	210.19
	8.00	25.00	0.45	16.00	0.39	71.01
	12.00	4.00	7.60	9.00	0.89	242.85
	8.00	51.00	0.55	9.00	0.39	99.59
	12.00	2.00	7.60	4.00	0.89	53.97
	8.00	51.00	1.35	4.00	0.39	108.64
	8.00	51.00	0.85	4.00	0.39	68.40
	12.00	4.00	3.85	1.00	0.89	13.67
	8.00	26.00	0.55	1.00	0.39	5.64
	12.00	4.00	7.60	1.00	0.89	26.98
	8.00	51.00	0.55	1.00	0.39	11.07
	12.00	4.00	2.10	11.00	0.89	82.01
	8.00	14.00	0.55	11.00	0.39	33.41
	12.00	4.00	3.85	3.00	0.89	41.01
	8.00	26.00	0.55	3.00	0.39	16.92
	12.00	4.00	1.60	2.00	0.89	11.36
	8.00	11.00	0.55	2.00	0.39	4.77
	12.00	4.00	1.85	5.00	0.89	32.84
	8.00	12.00	0.55	5.00	0.39	13.02
	12.00	4.00	1.10	2.00	0.89	7.81
	8.00	7.00	0.55	2.00	0.39	3.04
	8.00	51.00	0.85	1.00	0.39	17.10
	8.00	51.00	1.35	1.00	0.39	27.16
	12.00	4.00	2.10	7.00	0.89	52.19
	8.00	14.00	0.55	7.00	0.39	21.26
	12.00	4.00	3.10	5.00	0.89	55.03
	8.00	21.00	0.55	5.00	0.39	22.78
	12.00	4.00	1.60	6.00	0.89	34.08
	8.00	11.00	0.55	6.00	0.39	14.32
	12.00	4.00	1.10	1.00	0.89	3.91
	8.00	7.00	0.55	1.00	0.39	1.52
	8.00	44.00	0.85	1.00	0.39	14.75
	12.00	2.00	2.64	1.00	0.89	4.69
	12.00	2.00	0.50	1.00	0.89	0.89
	12.00	2.00	0.90	1.00	0.89	1.60
	8.00	1.00	1.85	1.00	0.39	0.73
	8.00	1.00	1.57	1.00	0.39	0.62
	8.00	1.00	1.37	1.00	0.39	0.54
	8.00	1.00	1.05	1.00	0.39	0.41
	8.00	1.00	0.81	1.00	0.39	0.32
	12.00	2.00	2.55	1.00	0.89	4.53
	12.00	2.00	0.50	1.00	0.89	0.89
	12.00	2.00	0.90	1.00	0.89	1.60
	8.00	1.00	1.57	1.00	0.39	0.62
	8.00	1.00	1.37	1.00	0.39	0.54
	8.00	1.00	1.05	1.00	0.39	0.41
	8.00	1.00	0.81	1.00	0.39	0.32
	10.00	1.00	2.20	7.00	0.62	9.49
	10.00	1.00	1.40	7.00	0.62	6.04
	10.00	1.00	1.60	7.00	0.62	6.90
	10.00	1.00	2.10	7.00	0.62	9.06
	10.00	7.00	0.80	19.00	0.62	65.58
	10.00	1.00	173.00	1.00	0.62	106.64
	8.00	13.00	1.05	4.00	0.39	21.54

Type of Foundation	Wide (m)	Height (m)	Lengt (m)	Sub-total (m3)	Total (m3)
Stone masonry F-1	0.55	0.80	5.00	2.20	8.80
	0.55	0.80	7.50	3.30	
	0.55	0.80	7.50	3.30	
F-2	0.55	0.80	5.00	2.20	3.25
	0.55	0.80	0.38	0.17	
	0.55	0.80	2.00	0.88	
F-4	0.55	0.80	7.50	3.30	7.26
	0.55	0.80	7.50	3.30	
	0.55	0.80	1.50	0.66	
F-5	0.55	0.80	10.00	4.40	5.72
	0.55	0.80	1.50	0.66	
	0.55	0.80	1.50	0.66	
F-6	0.55	0.80	5.00	2.20	5.50
	0.55	0.80	2.00	0.88	
	0.55	0.80	2.00	0.88	
	0.55	0.80	2.00	0.88	
	0.55	0.80	1.50	0.66	

Type of Foundation	Height (m)	Wide (m)	Each	Unit	Sub-total (m3)	Total (m3)
Brick block F-7	0.25	0.40	2.00	2.00	0.40	0.48
	0.25	0.40	1.00	2.00	0.20	
	0.20	0.30	1.00	2.00	0.12	
F-8	0.25	0.40	3.00	1.00	0.30	0.30
F-9	0.25	0.65	1.00	3.75	0.61	4.59
	0.25	0.65	1.00	1.50	0.24	
	0.25	0.65	1.00	7.00	1.14	
	0.25	0.65	1.00	7.50	1.22	
	0.25	0.65	1.00	2.00	0.33	
	0.25	0.65	1.00	6.50	1.06	

Type of Foundation	Wide (m)	Height (m)	Lengt (m)	Sub-total (m3)	Total (m3)
Dry stone masonry F-1	0.20	1.15	5.00	1.15	4.60
	0.20	1.15	7.50	1.73	
	0.20	1.15	7.50	1.73	
F-2	0.20	1.15	5.00	1.15	1.70
	0.20	1.15	0.38	0.09	
	0.20	1.15	2.00	0.46	
F-4	0.20	1.15	7.50	1.73	3.80
	0.20	1.15	7.50	1.73	
	0.20	1.15	1.50	0.35	
F-5	0.20	1.15	10.00	2.30	2.99
	0.20	1.15	1.50	0.35	
	0.20	1.15	1.50	0.35	
F-6	0.20	1.15	5.00	1.15	2.88
	0.20	1.15	2.00	0.46	
	0.20	1.15	2.00	0.46	
	0.20	1.15	2.00	0.46	
	0.20	1.15	1.50	0.35	

Earth cut	Wide (m)	Height (m)	Lengt (m)	Sub-total (m3)	Total (m3)	
F-1	1.40	0.90	5.00	6.30	25.20	
	1.40	0.90	7.50	9.45		
	1.40	0.90	7.50	9.45		
F-2	1.40	0.90	5.00	6.30	9.29	
	1.40	0.90	0.38	0.47		
	1.40	0.90	2.00	2.52		
F-4	1.40	0.90	7.50	9.45	20.79	
	1.40	0.90	7.50	9.45		
	1.40	0.90	1.50	1.89		
F-5	1.40	0.90	10.00	12.60	16.38	
	1.40	0.90	1.50	1.89		
	1.40	0.90	1.50	1.89		
F-6	1.40	0.90	5.00	6.30	15.75	
	1.40	0.90	2.00	2.52		
	1.40	0.90	2.00	2.52		
	1.40	0.90	2.00	2.52		
	1.40	0.90	1.50	1.89		
Earth cut	Wide (m)	Height (m)	Each	Unit	Sub-total (m3)	Total (m3)
F-7	0.55	0.40	2.00	2.00	0.88	1.02
	0.55	0.40	1.00	2.00	0.44	
	0.50	0.30	1.00	2.00	0.30	
F-8	0.55	0.40	3.00	1.00	0.66	0.66
F-9	0.55	0.65	1.00	3.75	1.34	10.10
	0.55	0.65	1.00	1.50	0.54	
	0.55	0.65	1.00	7.00	2.50	
	0.55	0.65	1.00	7.50	2.68	
	0.55	0.65	1.00	2.00	0.72	
	0.55	0.65	1.00	6.50	2.32	

Sand fill	Wide (m)	Height (m)	Lengt (m)	Sub-total (m3)	Total (m3)	
F-1	1.05	0.10	5.00	0.53	2.10	
	1.05	0.10	7.50	0.79		
	1.05	0.10	7.50	0.79		
F-2	1.05	0.10	5.00	0.53	0.77	
	1.05	0.10	0.38	0.04		
	1.05	0.10	2.00	0.21		
F-4	1.05	0.10	7.50	0.79	1.73	
	1.05	0.10	7.50	0.79		
	1.05	0.10	1.50	0.16		
F-5	1.05	0.10	10.00	1.05	1.37	
	1.05	0.10	1.50	0.16		
	1.05	0.10	1.50	0.16		
F-6	1.05	0.10	5.00	0.53	1.31	
	1.05	0.10	2.00	0.21		
	1.05	0.10	2.00	0.21		
	1.05	0.10	2.00	0.21		
	1.05	0.10	1.50	0.16		
F-7	0.35	0.10	2.00	2.00	0.14	0.14
	0.35	0.10	1.00	2.00	0.07	
	0.35	0.10	1.00	2.00	0.07	
F-8	0.35	0.10	3.00	1.00	0.11	0.11
F-9	0.35	0.10	1.00	3.75	0.13	0.99
	0.35	0.10	1.00	1.50	0.05	
	0.35	0.10	1.00	7.00	0.25	
	0.35	0.10	1.00	7.50	0.26	
	0.35	0.10	1.00	2.00	0.07	
	0.35	0.10	1.00	6.50	0.23	

Type of Truss	Dimension	Weight/m (kg)	Length (m)	Each	Sub-total (m ³)	Total (m ³)	
TRUSS K-1	50.50.5	3.74	3.15	4.00	47.15	166.54	
		3.74	5.00	4.00	74.85		
		3.74	1.05	2.00	7.86		
		3.74	1.40	4.00	20.96		
		3.74	2.10	2.00	15.72		
			1.00	X	166.54		166.54
TRUSS K-1'	50.50.5	3.74	3.15	4.00	47.15	180.25	
		3.74	5.00	4.00	74.85		
		3.74	1.05	2.00	7.86		
		3.74	1.40	4.00	20.96		
		PIPE D= 101.6 t=5.6	14.02	2.10	1.00		29.44
			1.00	X	180.25		180.25
TRUSS K-2	50.50.5	3.74	3.15	2.00	23.58	60.63	
		3.74	2.50	2.00	18.71		
		3.74	1.05	2.00	7.86		
		3.74	1.40	2.00	10.48		
			1.00	X	60.63		60.63
TRUSS K-3	60.60.6	5.65	6.08	4.00	137.46	465.41	
		5.65	10.60	2.00	119.82		
		5.65	0.92	4.00	20.80		
		5.65	1.80	4.00	40.69		
		5.65	1.96	4.00	44.31		
		5.65	2.48	4.00	56.07		
		PIPE D= 101.6 t=5.6	14.02	3.30	1.00		46.26
			1.00	X	465.41		465.41
TRUSS K-4	60.60.6	5.65	6.08	2.00	68.73	209.58	
		5.65	5.30	2.00	59.91		
		5.65	0.92	2.00	10.40		
		5.65	1.80	2.00	20.35		
		5.65	1.96	2.00	22.16		
		5.65	2.48	2.00	28.03		
			2.00	X	209.58		419.15
TRUSS K-5	60.60.6	5.65	3.75	2.00	42.39	172.50	
		5.65	1.05	2.00	11.87		
		5.65	2.10	2.00	23.74		
		5.65	1.48	2.00	16.73		
		5.65	2.08	2.00	23.51		
		5.65	4.80	2.00	54.26		
			2.00	X	172.50		345.00
TRUSS KS-1	70.70.7	7.69	0.72	1.00	5.54	20.04	
		7.69	0.93	1.00	7.12		
		7.69	0.96	1.00	7.39		
			14.00	X	20.04		280.56
TRUSS KS-2	70.70.7	7.69	0.78	1.00	5.96	16.42	
		7.69	0.60	1.00	4.62		
		7.69	0.76	1.00	5.85		
			15.00	X	16.42		248.37

Name of work	Dlmention	Weight/m (kg)	Lengt (m)	Each	Sub-total (m3)	Total (m3)
Steel purlin	150.50.2.3.2	7.28	1.70	2.00	24.77	
		7.28	6.50	2.00	94.70	
		7.28	5.30	2.00	77.22	
		7.28	15.30	1.00	111.46	
		7.28	7.30	1.00	53.18	
		7.28	1.00	1.00	7.28	
		7.28	3.00	1.00	21.85	
		7.28	5.00	1.00	36.42	
		7.28	7.00	1.00	50.99	
		7.28	9.30	4.00	270.99	
		7.28	7.20	4.00	209.80	
		7.28	5.00	4.00	145.70	
		7.28	3.00	4.00	87.42	
		7.28	1.00	4.00	29.14	
		7.28	9.50	2.00	138.41	
		7.28	8.00	2.00	116.56	
7.28	2.50	2.00	36.42	1,512.32		

ELECTRICAL BUILDING VOLUME CALCULATION

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
CONCRETE	0.15	0.15	3.80	14.00	1.20	
	0.15	0.20	2.00	9.00	0.54	
	0.15	0.20	1.40	4.00	0.17	
	0.15	0.20	5.00	4.00	0.60	
	0.15	0.20	3.00	4.00	0.36	
	0.15	0.15	5.00	2.00	0.23	
	0.15	0.15	3.00	2.00	0.14	
	0.15	0.20	4.00	8.00	0.96	
	0.15	0.20	2.00	6.00	0.36	
	0.15	0.15	4.00	3.00	0.27	
	0.15	0.15	2.00	2.00	0.09	4.91

Name of work	Diameter (mm)	Each	Lenth (M)	Qty.	Weight (Kg/m)	Total (Kg)
STEEL BAR	12.00	4.00	3.90	14.00	0.89	194.22
	6.00	26.00	0.45	14.00	0.22	36.42
	12.00	4.00	2.10	9.00	0.89	67.23
	6.00	14.00	0.55	9.00	0.22	15.41
	12.00	4.00	1.50	4.00	0.89	21.34
	6.00	10.00	0.55	4.00	0.22	4.89
	12.00	4.00	5.10	4.00	0.89	72.57
	6.00	24.00	0.55	4.00	0.22	11.74
	12.00	4.00	3.10	4.00	0.89	44.11
	6.00	21.00	0.55	4.00	0.22	10.27
	12.00	4.00	5.10	2.00	0.89	36.28
	6.00	34.00	0.45	2.00	0.22	6.80
	12.00	4.00	3.10	2.00	0.89	22.05
	6.00	21.00	0.45	2.00	0.22	4.20
	12.00	4.00	4.10	8.00	0.89	116.68
	6.00	27.00	0.55	8.00	0.22	26.41
	12.00	4.00	2.10	6.00	0.89	44.82
	6.00	14.00	0.55	6.00	0.22	10.27
	12.00	4.00	4.10	3.00	0.89	43.75
	6.00	27.00	0.45	3.00	0.22	8.10
12.00	4.00	2.10	2.00	0.89	14.94	
6.00	14.00	0.45	2.00	0.22	2.80	
						815.32

Name of work	Wide (m)	Height (m)	Each	Unit	Sub-total (m3)	Total (m3)
Earth cut	F-1	1.35	1.10	1.00	14.00	20.79
	F-2	1.35	1.10	1.00	3.00	4.46
	F-3	1.35	1.10	1.00	14.00	20.79
	F-4	1.35	1.10	1.00	4.00	5.94
	F-5	1.35	1.10	1.00	8.00	11.88
	F-6	0.55	0.65	1.00	6.00	2.15
						66.00

Name of work	Wide (m)	Height (m)	Each	Unit	Sub-total (m3)	Total (m3)
Dry stone masonry	F-1	1.05	0.20	1.00	14.00	2.94
	F-2	1.05	0.20	1.00	3.00	0.63
	F-3	1.05	0.20	1.00	14.00	2.94
	F-4	1.05	0.20	1.00	4.00	0.84
	F-5	1.05	0.20	1.00	8.00	1.68
	F-6	-	-	-	-	-

Name of work	Wide (m)	Height (m)	Each	Unit	Sub-total (m3)	Total (m3)
Sand fill	F-1	1.15	0.10	1.00	14.00	1.61
	F-2	1.15	0.10	1.00	3.00	0.35
	F-3	1.15	0.10	1.00	14.00	1.61
	F-4	1.15	0.10	1.00	4.00	0.46
	F-5	1.15	0.10	1.00	8.00	0.92
	F-6	0.35	0.10	1.00	6.00	0.21
						5.16

Name of work	Wide (m)	Height (m)	Each	Unit	Sub-total (m3)	Total (m3)
Stone masonry	F-1	0.63	0.80	1.00	14.00	7.00
	F-2	0.63	0.80	1.00	3.00	1.50
	F-3	0.63	0.80	1.00	14.00	7.00
	F-4	0.63	0.80	1.00	4.00	2.00
	F-5	0.63	0.80	1.00	8.00	4.00
	F-6	0.25	0.60	1.00	6.00	0.90
						21.50
						0.90

Earth fill	Wide (m)	Height (m)	Each	Stone m. (m3)	D. stone m. (m3)	Sand fill (m3)	Total (m3)
F-1	1.40	0.90	14.00	7.00	2.94	1.61	6.09
F-2	1.40	0.90	3.00	1.50	0.63	0.35	1.31
F-3	1.40	0.90	14.00	7.00	2.94	1.61	6.09
F-4	1.40	0.90	4.00	2.00	0.84	0.46	1.74
F-5	1.40	0.90	8.00	4.00	1.68	0.92	3.48
F-6	0.55	0.65	6.00	0.90	-	0.21	1.04
							19.74

Type of Truss	Dimention	Weight/m (kg)	Lengt (m)	Each	Sub-total (m3)	Total (m3)
TRUSS K-1	50.50.5	3.74	1.30	4.00	19.46	
		3.74	1.20	4.00	17.96	
		3.74	0.92	4.00	13.77	
		3.74	1.00	4.00	14.97	
		3.74	0.76	4.00	11.38	
		3.74	1.16	4.00	17.36	
	PIPE D= 101.6 t=5.6	14.02	1.70	1.00	23.83	118.74
			2.00	X	118.74	237.47

Type of Truss	Dimention	Weight/m (kg)	Wide (m)		Each	Sub-total (m3)	Total (m3)
TRUSS K-1 PLATE	8 mm	62.76	0.20	0.40	2.00	10.04	
		62.76	0.20	0.25	2.00	6.28	
		62.76	0.24	0.40	2.00	12.05	
		62.76	0.20	0.26	2.00	6.53	
		62.76	0.14	0.24	2.00	4.22	
	80.80.8	10.04	0.16	4.00	2.00	12.85	
	D = 22	2.98	0.40	2.00	4.00	9.54	61.50
				2.00	X	61.50	123.01

Type of Truss	Dimention	Weight/m (kg)	Lengt (m)	Each	Sub-total (m3)	Total (m3)
TRUSS K-2	50.50.5	3.74	1.30	4.00	19.46	
		3.74	1.20	4.00	17.96	
		3.74	0.92	4.00	13.77	
		3.74	1.00	4.00	14.97	
		3.74	0.76	4.00	11.38	
		3.74	1.16	4.00	17.36	
		3.74	1.70	2.00	12.72	107.62
				1.00	X	107.62

Type of Truss	Dimension	Weight/m (kg)	Wide (m)		Each	Sub-total (m3)	Total (m3)	
TRUSS K-2 PLATE	8 mm	62.76	0.20	0.40	2.00	10.04		
		62.76	0.20	0.25	2.00	6.28		
		62.76	0.24	0.40	2.00	12.05		
		62.76	0.20	0.26	2.00	6.53		
		62.76	0.14	0.24	2.00	4.22		
	80.80.8	10.04	0.16	4.00	1.00	6.43		
	D = 22	2.98	0.40	2.00	4.00	9.54		55.08
			1.00	X		55.08		55.08

Type of Truss	Dimension	Weight/m (kg)	Length (m)	Each	Sub-total (m3)	Total (m3)
TRUSS K-3	50.50.5	3.74	1.30	2.00	9.73	
		3.74	1.20	2.00	8.98	
		3.74	0.92	2.00	6.89	
		3.74	1.00	2.00	7.48	
		3.74	0.76	2.00	5.69	
	3.74	1.16	1.00	4.34	43.11	
			2.00	X	43.11	86.22

Type of Truss	Dimension	Weight/m (kg)	Wide (m)		Each	Sub-total (m3)	Total (m3)	
TRUSS K-3 PLATE	8 mm	62.76	0.20	0.40	2.00	10.04		
		62.76	0.20	0.25	2.00	6.28		
		62.76	0.24	0.40	2.00	12.05		
		62.76	0.20	0.26	2.00	6.53		
		62.76	0.14	0.24	2.00	4.22		
	80.80.8	10.04	0.16	4.00	1.00	6.43		
	D = 22	2.98	0.40	2.00	4.00	9.54		55.08
			2.00	X		55.08		110.15

Type of Truss	Dimension	Weight/m (kg)	Length (m)	Each	Sub-total (m3)	Total (m3)
TRUSS KS	70.70.7	7.69	0.56	1.00	4.31	
		7.69	0.44	1.00	3.38	
		7.69	0.63	1.00	4.81	
		12.00	X	12.50	149.96	

Type of Truss	Dimension	Weight/m (kg)	Wide (m)		Each	Sub-total (m3)	Total (m3)	
TRUSS KS PLATE	8 mm	62.76	0.14	0.16	2.00	2.81		
		62.76	0.10	0.20	2.00	2.51		
		62.76	0.32	0.20	2.00	8.03		
	D = 12	0.89	0.13	2.00	1.00	0.22		13.58
			12.00	X		13.58		162.92

STORAGE BUILDING VOLUME CALCULATION

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
Concrete	0.25	0.30	4.35	8.00	2.61	
	1.50	0.15	4.35	2.00	1.96	
	0.15	0.25	3.35	1.00	0.13	
	0.15	0.20	1.58	1.00	0.05	
	0.20	0.40	3.35	4.00	1.07	
	0.20	0.40	3.30	2.00	0.53	
	0.15	0.20	1.50	1.00	0.05	
	0.20	0.20	3.25	4.00	0.52	
	0.15	0.20	3.25	1.00	0.10	
	0.20	0.25	3.25	4.00	0.65	
	0.20	0.25	3.30	2.00	0.33	
	0.15	0.25	3.35	1.00	0.13	
	0.20	0.30	10.00	1.00	0.60	
	0.15	0.25	3.50	1.00	0.13	
	0.25	0.45	7.00	4.00	3.15	
	0.15	0.25	3.50	1.00	0.13	
	0.20	0.20	1.08	14.00	0.60	
	0.15	0.20	3.50	1.00	0.11	
	0.15	0.20	1.50	2.00	0.09	
	0.20	0.25	7.00	4.00	1.40	
0.12	11.95	8.95	1.00	12.83		
0.10	0.40	42.60	1.00	1.70		
0.12	3.62	2.00	1.00	0.87		
0.12	3.47	2.00	1.00	0.83		
						30.56

Name of work	Diameter (mm)	Each	Lenth (M)	Qty.	Weight (Kg/m)	Total (Kg)
Steel bar	16.00	6.00	4.45	8.00	1.58	337.70
	16.00	4.00	4.45	2.00	1.58	56.28
	16.00	5.00	3.45	1.00	1.58	27.27
	16.00	4.00	1.60	1.00	1.58	10.12
	16.00	8.00	3.40	2.00	1.58	86.01
	16.00	4.00	1.60	1.00	1.58	10.12
	16.00	4.00	3.45	1.00	1.58	21.82
	16.00	4.00	3.40	2.00	1.58	43.00
	16.00	5.00	3.45	1.00	1.58	27.27
	16.00	5.00	10.10	1.00	1.58	79.84
	16.00	4.00	3.60	1.00	1.58	22.77
	16.00	10.00	7.10	4.00	1.58	449.00
	16.00	4.00	7.10	4.00	1.58	179.60

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
Earth cut	1.20	0.90	42.00	1.00	45.36	
	0.35	0.40	6.85	1.00	0.96	
	1.20	1.25	1.20	14.00	25.20	71.52
Earth fill	0.68	0.70	42.00	1.00	19.99	
	0.07	0.20	6.85	1.00	0.10	
	1.00	0.94	1.20	14.00	15.79	35.88
Sand fill	1.00	0.10	42.00	1.00	4.20	
	0.50	0.10	6.85	1.00	0.34	
	0.30	0.10	14.00	1.00	0.42	4.96
Dry stone masonry	1.10	0.20	42.00	1.00	9.24	9.24

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
Stone masonry	0.55	0.80	42.00	1.00	18.48	19.36
	0.30	0.43	6.80	1.00	0.88	
Brick masonry	0.30	0.15	14.00	1.00	0.63	0.63

Name of work	Diameter (mm)	Each	Lenth (M)	Qty.	Weight (Kg/m)	Total (Kg)
Steel bar	8.00	30.00	0.95	8.00	0.39	89.94
	8.00	30.00	0.45	2.00	0.39	10.65
	8.00	23.00	0.65	1.00	0.39	5.90
	8.00	11.00	0.55	1.00	0.39	2.39
	12.00	8.00	3.45	4.00	0.89	97.99
	8.00	23.00	1.05	4.00	0.39	38.11
	8.00	23.00	1.05	2.00	0.39	19.05
	8.00	11.00	0.55	1.00	0.39	2.39
	12.00	4.00	3.35	4.00	0.89	47.58
	8.00	22.00	0.65	4.00	0.39	22.56
	8.00	23.00	0.55	1.00	0.39	4.99
	12.00	4.00	3.45	4.00	0.89	49.00
	8.00	23.00	0.75	4.00	0.39	27.22
	8.00	23.00	0.75	2.00	0.39	13.61
	8.00	23.00	0.65	1.00	0.39	5.90
	8.00	67.00	0.85	1.00	0.39	22.47
	8.00	24.00	0.65	1.00	0.39	6.15
	12.00	2.00	7.10	4.00	0.89	50.42
	8.00	47.00	1.25	4.00	0.39	92.71
	12.00	4.00	3.60	1.00	0.89	12.78
	8.00	24.00	0.65	1.00	0.39	6.15
	12.00	5.00	1.18	14.00	0.89	73.01
	8.00	8.00	0.65	14.00	0.39	28.72
	12.00	4.00	3.60	1.00	0.89	12.78
	8.00	24.00	0.55	1.00	0.39	5.21
	12.00	4.00	1.60	2.00	0.89	11.36
	8.00	11.00	0.55	2.00	0.39	4.77
	8.00	47.00	0.75	4.00	0.39	55.62
	10.00	82.00	9.25	1.00	0.62	467.53
	6.00	82.00	9.25	1.00	0.22	168.31
	10.00	82.00	2.03	2.00	0.62	204.70
	10.00	82.00	1.85	1.00	0.62	93.51
	12.00	41.00	3.62	1.00	0.89	131.74
	12.00	41.00	3.62	1.00	0.89	131.74
	10.00	62.00	12.20	1.00	0.62	466.24
	6.00	62.00	12.20	1.00	0.22	167.85
	10.00	62.00	1.98	2.00	0.62	150.95
	10.00	62.00	1.70	2.00	0.62	129.94
	12.00	25.00	2.05	1.00	0.89	45.49
	12.00	25.00	2.05	1.00	0.89	45.49
	12.00	82.00	4.05	2.00	0.89	589.55
	12.00	3.00	12.20	2.00	0.89	64.97
	12.00	62.00	4.05	2.00	0.89	445.76
	12.00	3.00	9.25	2.00	0.89	49.26
	12.00	82.00	0.89	2.00	0.89	129.55
	12.00	6.00	12.20	2.00	0.89	129.95
	12.00	62.00	0.89	2.00	0.89	97.96
	12.00	6.00	9.25	2.00	0.89	98.52
						4,628.43

OFFICE EQUIPMENT & MAINTENANCE STORAGE VOLUME CALCULATION

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
CONCRETE	0.30	0.30	4.35	16.00	6.26	
	0.25	0.45	5.00	14.00	7.88	
	0.20	0.25	5.00	14.00	3.50	
	0.15	0.15	5.00	1.00	0.11	
	0.25	0.45	6.50	8.00	5.85	
	0.15	0.15	6.50	1.00	0.15	
	0.15	0.15	4.35	7.00	0.69	
	0.20	0.30	5.00	7.00	2.10	
	0.15	0.20	5.00	1.00	0.15	
	0.40	0.10	74.30	1.00	2.97	
	0.40	0.10	17.30	1.00	0.69	
	37.15	8.65	0.12	1.00	38.56	
	29.50	1.50	0.12	1.00	5.31	
	0.20	0.25	6.50	8.00	2.60	
	0.15	0.20	2.00	1.00	0.06	
0.20	0.20	1.08	36.00	1.55		
0.20	0.20	1.50	12.00	0.72		
						79.15

Name of work	Diameter (mm)	Each	Lenth (M)	Qty.	Weight (Kg/m)	Total (Kg)
STEEL BAR	16.00	12.00	4.45	16.00	1.58	1,350.79
	16.00	9.00	5.10	14.00	1.58	1,015.94
	16.00	4.00	5.10	1.00	1.58	32.25
	16.00	9.00	6.60	8.00	1.58	751.28
	16.00	4.00	6.60	1.00	1.58	41.74
	16.00	4.00	4.45	7.00	1.58	196.99
	16.00	6.00	5.10	7.00	1.58	338.65
	16.00	4.00	5.10	1.00	1.58	32.25
	16.00	4.00	2.10	1.00	1.58	13.28

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
EARTH CUT	1.20	0.90	103.00	1.00	111.24	
	0.35	0.40	51.50	1.00	7.21	
	1.20	1.25	1.20	24.00	43.20	161.65
EARTH FILL	0.68	0.70	103.00	1.00	49.03	
	0.07	0.20	51.50	1.00	0.72	
	1.00	0.94	1.20	24.00	27.07	76.82
SAND FILL	1.00	0.10	103.00	1.00	10.30	
	0.20	0.10	51.50	1.00	1.03	
	1.20	0.10	1.20	24.00	3.46	14.79
DRY STONE MASONRY	1.10	0.20	103.00	1.00	22.66	22.66
STONE MASONRY	0.55	0.80	103.00	1.00	45.32	45.32
BRICK BLOCK	0.30	0.15	26.00	1.00	1.17	
	0.30	0.65	25.05	1.00	4.88	6.05

Name of work	Diameter (mm)	Each	Lenth (M)	Qty.	Weight (Kg/m)	Total (Kg)
STEEL BAR	8.00	30.00	1.05	16.00	0.39	198.82
	12.00	2.00	5.10	14.00	0.89	126.75
	8.00	34.00	1.25	14.00	0.39	234.72
	12.00	4.00	5.10	14.00	0.89	253.50
	8.00	34.00	0.75	14.00	0.39	140.83
	8.00	34.00	0.45	1.00	0.39	6.04
	12.00	2.00	6.60	8.00	0.89	93.73
	8.00	44.00	1.25	8.00	0.39	173.58
	8.00	44.00	0.45	1.00	0.39	7.81
	8.00	30.00	0.45	7.00	0.39	37.28
	8.00	34.00	0.85	7.00	0.39	79.81
	8.00	34.00	0.55	1.00	0.39	7.38
	12.00	4.00	6.50	8.00	0.89	184.62
	8.00	44.00	0.75	8.00	0.39	104.15
	8.00	14.00	0.55	1.00	0.39	3.04
	10.00	248.00	8.70	1.00	0.62	1,329.93
	10.00	248.00	8.70	1.00	0.62	1,329.93
	10.00	248.00	1.93	2.00	0.62	588.53
	10.00	248.00	1.65	1.00	0.62	252.23
	10.00	58.00	37.20	1.00	0.62	1,329.93
	6.00	58.00	37.20	1.00	0.22	478.77
	10.00	58.00	1.73	2.00	0.62	123.34
	10.00	58.00	1.25	13.00	0.62	580.95
	10.00	197.00	1.55	1.00	0.62	188.22
	12.00	197.00	1.55	1.00	0.89	271.03
	12.00	11.00	29.55	1.00	0.89	288.52
	10.00	11.00	29.55	1.00	0.62	200.36
						8,613.78

CONTROL HOUSE 1 IN SIMONGAN WEIR

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
Concrete	0.25	0.25	3.25	4.00	0.81	4.74
	0.15	0.15	3.25	2.00	0.15	
	0.20	0.25	6.45	4.00	1.29	
	0.20	0.40	6.45	4.00	2.06	
	0.20	0.20	3.60	2.00	0.29	
	0.20	0.20	1.80	2.00	0.14	

Name of work	Steel bar Diameter	Each	Lengt	Qty	Weight Kg/m	Total Weight
STEEL BAR	16.00	3.35	4.00	4.00	1.58	84.63
	16.00	6.55	4.00	4.00	1.58	165.48
	16.00	6.55	4.00	9.00	1.58	372.32
						622.43
STEEL BAR	12.00	3.35	2.00	4.00	0.89	23.79
	8.00	0.85	4.00	33.00	0.39	44.26
	8.00	0.45	4.00	22.00	0.39	15.62
	8.00	0.75	4.00	44.00	0.39	52.07
	8.00	1.05	4.00	44.00	0.39	72.90
	12.00	3.70	2.00	4.00	0.89	26.27
	8.00	0.65	2.00	25.00	0.39	12.82
	12.00	1.90	2.00	4.00	0.89	13.49
	8.00	0.65	2.00	13.00	0.39	6.67
						267.90

CONTROL HOUSE 2 IN SIMONGAN WEIR

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
	0.25	0.25	3.25	6.00	1.22	7.36
	0.15	0.15	3.25	4.00	0.29	
	0.20	0.25	6.48	4.00	1.30	
	0.20	0.25	6.60	3.00	0.99	
	0.20	0.40	6.48	4.00	2.07	
	0.20	0.40	6.60	2.00	1.06	
	0.20	0.20	3.60	2.00	0.29	
	0.20	0.20	1.80	2.00	0.14	

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
STEEL BAR	16.00	3.35	4.00	6.00	1.58	126.95
	16.00	6.58	4.00	4.00	1.58	166.11
	16.00	6.70	4.00	3.00	1.58	126.95
	16.00	6.58	9.00	4.00	1.58	373.74
	16.00	6.70	9.00	2.00	1.58	190.42
						984.17
STEEL BAR	12.00	3.35	4.00	4.00	0.89	47.58
	8.00	0.85	33.00	6.00	0.39	66.39
	8.00	0.45	22.00	4.00	0.39	15.62
	8.00	0.75	44.00	4.00	0.39	52.07
	8.00	0.75	45.00	3.00	0.39	39.94
	8.00	1.05	44.00	4.00	0.39	72.90
	8.00	1.05	44.00	2.00	0.39	36.45
	12.00	3.70	2.00	2.00	0.89	13.14
	8.00	0.65	2.00	2.00	0.39	1.03
	12.00	1.90	2.00	2.00	0.89	6.75
	8.00	0.65	2.00	2.00	0.39	1.03
						352.89

SECURITY HUT VOLUME

Name of work	Height (M)	Wide (M)	Lenth (M)	Qty.	Subtotal (M3)	Total (M3)
CONCRETE	0.15	0.15	3.35	7.00	0.53	
	0.15	0.20	17.00	1.00	0.51	
	0.15	0.20	17.00	1.00	0.51	1.55

Name of work	Steel bar Diameter	Each	Lengt	Qty	Weight Kg/m	Total Weight
STEEL BAR	12.00	3.45	7.00	4.00	0.89	85.74
	8.00	0.45	7.00	23.00	0.39	28.58
	12.00	3.55	4.00	4.00	0.89	50.42
	12.00	1.55	2.00	4.00	0.89	11.01
	8.00	0.55	4.00	24.00	0.39	20.83
	8.00	0.55	2.00	11.00	0.39	4.77
	12.00	3.55	4.00	4.00	0.89	50.42
	12.00	1.55	2.00	4.00	0.89	11.01
	8.00	0.55	4.00	24.00	0.39	20.83
	8.00	0.55	4.00	11.00	0.39	9.55
						293.15

Name of work	W (M)	H (M)	Each	Sub-total (M3)	Volume (M3)
EARTH CUT	1.80	1.05	16.03	30.29	30.29
EARTH FILL	1.20	0.80	16.03	15.38	15.38
SAND FILL	0.10	1.05	16.03	1.68	1.68
DRY MASONRY	0.15	1.15	16.03	2.76	2.76
STONE MASONRY	0.55	0.80	16.03	7.05	7.05
BRICK BLOCK	0.30	0.45	3.60	0.49	0.49

TYPE OF WORK : BOX CULVERT

LOCATION :

: Weir Management Complex

CALCULATION		RESULT
CONCRETE (TYPE-CI)		
$A = 3.7 \times 3.11 - 3.0 \times 2.26 + 0.2 \times 0.2 + 2 \times 4$	$= 4.807$	
$L = 4.000 : \sin(68.0^\circ)$	$= 4.314$	
$V = 4.807 \times 4.314 + 0.35 \times 0.35 : 2 \times 3.11 \times 4$	$= 21.499 \text{ m}^3$	21.499 m ³
FORM		
$A \text{ OUTSIDE} = 3.11 \times 4.314 \times 2$	$= 26.833$	
$A \text{ INSIDE} = 2.26 \times 4.314 \times 2 + 3.0 \times 4.314$	$= 32.441$	
TOTAL	$= 59.274$	59.274 m ²
CONCRETE (TYPE-CI)		
1. $A = 1.0 \times 1.0$	$= 1.000$	
2. $A = (0.1 + 3.61) \times 2.8 : 2$	$= 5.194$	
3. $A = 3.99 \times 3.61 - 3.236 \times 2.260 + 0.2 \times 0.2 : 2 \times 4$	$= 7.171$	
4. $A = (1.886 + 3.610) \times 1.9 :$	$= 5.221$	
TOTAL	$= 18.586$	
$V = 18.586 \times 0.350$	$= 6.505$	6.505 m ³
FORM		
$A \text{ FRONT} = 18.586 \text{ m}^2$	$= 18.586$	
$A \text{ BACK} = 18.586 \text{ m}^2$	$= 18.586$	
$A \text{ SIDE} = 1.0 \times 0.35 + 1.886 \times 0.35$	$= 1.010$	
TOTAL	$= 38.182$	38.182 m ²

TYPE OF WORK : BOX CULVERT

LOCATION :

CALCULATION		RESULT
CONCRETE (TYPE -C1)		
1. $A = 1.0 \times 0.444$	= 0.444	
2. $A = (0.1 + 3.610) \times 2.816 : 2$	= 6.491	
3. $A = 3.99 \times 3.610 - 3.236 \times 2.260 + 0.2 \times 0.2 : 2 \times 4$	= 7.171	
4. $A = (1.886 + 3.610) \times 2.816 : 2$	= 6.491	
5. $A = 1.0 \times 0.444$	= 0.444	
TOTAL		
		= 21.041
$V = 21.041 \times 0.35$	= 7.364	7.364 m ³
FORM		
A FRONT	= 21.041	
A BACK	= 21.041	
A SIDE = $1.0 \times 0.35 \times 2$	= 0.700	
TOTAL		
		= 42.782
		42.782 m ²
TOTAL A,B,C		
CONCRETE = $21.499 + 6.505 + 7.364$	= 35.368	35.368 m ³
FORM = $59.274 + 38.182 + 42.782$	= 140.238	140.238 m ²
SUPPORTING		
$V = 2.26 \times 3.0 \times 4.314$	= 29.249 m ³	29.249 m ³
SCAFFOLDING		
SECTION A-A		
$A = 3.610 \times 4.314 \times 2$	= 3.142	
SECTION B-B		
$A = 9.347 \times 3.610 + (9.377 - 3.99) \times 3.610$	= 53.262	

TYPE OF WORK : BOX CULVERT
 LOCATION :

CALCULATION		RESULT
SECTION C-C		
$A = 10.590 \times 3.610 + (10.59 - 3.99) \times 3.610$	$= 62.056$	
TOTAL	$= 115.318$	115.318 m²
LEVELING CONCRETE		
TYPE E		
$A = (3.99 + 0.1 \times 2) \times 0.1$	$= 0.419$	
$V = 0.419 \times 4.314$	$= 1.808$	1.808 m³
FORM		
$(3.99 + 0.20) \times 0.1 \times 2$	$= 0.838$	
$(4.70 + 0.20) \times 0.1 \times 2$	$= 0.980$	
TOTAL	$= 1.818$	1.818 m²
SURFACE (A,T,B)		
$t_{ave} = (0.1 + 0.15) : 2$	$= 0.125$	
$L_{ave} = (10.59 + 9.397) : 2$	$= 9.994$	
$a = (0.085 + 0.125) \times 2.0 : 2 \times 2$	$= 0.419$	
$V = 0.42 \times 9.994$	$= 4.197$	4.197 m³
$W = 4.197 \times 2.30 \text{ t/m}^3$	$= 9.653$	9.653 t

TYPE OF WORK : BOX CULVERT

LOCATION :
:

CALCULATION		RESULT
$A = (9.5 + 4.5) \times 3.0 : 2 + 2.0 \times 4.5 + (8.0 + 4.5)$		
$\times 3.0 : 2$	$= 48.75 \text{ m}^2$	
$V = 48.750 \times 3.710$	$= 180.863$	180.863 m ³
REINFORCING BAR		
[BOX CULVERT SECTION]		
D16 (W = 1.58 kg/m)		
$L_1 = 3.52 \text{ m/Bar} \times 4 \text{ Bar} \times 2$	$= 28.16 \text{ m/m}$	
$L_2 = (1.76 + 1.45 + 30 \times 0.016) \times 4 \times 8 \text{ Bar}$	$= 118.08 \text{ m/m}$	
$L_3 = 2.905 \times 8 \text{ Bar}$	$= 23.24 \text{ m/m}$	
$L_4 = 1.00 \text{ m/Bar} \times 42 \text{ Bar} \times 2$	$= 84.00 \text{ m/m}$	
$W_1 = 253.48 \text{ m/m} \times 1.58 \text{ kg/m} = 400.50 \text{ kg/m}$	$= 0.401 \text{ t/m}$	
D13 (W = 1.04 kg/m)		
$L_5 = (0.85 + 15 \times 0.013 \times 2) \times 4 \text{ Bar} \times 2$	$= 9.92 \text{ m/m}$	
$W_2 = 9.92 \text{ m/m} \times 1.04 \text{ kg/m} = 10.32 \text{ kg/m}$	$= 0.010 \text{ t/m}$	
$\Sigma W_1 = 0.411 \text{ t/m} \times 5.10$	$= 2.096 \text{ t}$	
[WING WALL SECTION]		
D16 (W = 1.58 kg/m)		
$L_1 = 10.41 \times 3 \text{ Bars} \times 2$	$= 62.46 \text{ m/m}$	
$L_2 = (5.205 + 0.80) \times 1/2 \times 10 \times 2 \times 2$	$= 120.10 \text{ m/m}$	
$L_3 = 3.00 \times 2 \text{ Bars} \times 2 \times 2$	$= 24.00 \text{ m/m}$	
$L_4 = 1.35 \times 9 \text{ Bars} \times 2 \times 2$	$= 48.60 \text{ m/m}$	

TYPE OF WORK : BOX CULVERT FOR REVETMENT
 LOCATION : RIGHT SIDE

CALCULATION		RESULT
GRAVEL BEDDING		
1. REVETMENT		
$A = (3.7 + 3.8) \times 0.3 / 2$	= 1.125	
$V = 1.125 \times (4.5 + 3.4) / 2$	= 4.444	
2. BASE CONCRETE		
$V = 0.8 \text{ m}^3 / 10.0 \text{ m} \times 3.4 \text{ m}$	= 0.272	
3. TOP CONCRETE		
$V = 0.540 \text{ m}^3 / 10.0 \text{ m} \times 4.5 \text{ m}$	= 0.243	
TOTAL	= 4.959	4.959 m³
WET STONE MASONRY		
$A = (4.2 + 3.8) \times 0.3 / 2$	= 1.2	
$V = 1.2 \times (4.5 + 3.4) / 2$	= 4.74	4.740 m ³
CEMENT MORTAR POINTING		
$A = 4.2 \times (4.5 + 3.4) / 2$	= 16.59	16.590 m ³
CONCRETE TYPE C1		
1. BASE CONCRETE		
$W = 3.15 \text{ m}^3 / 10.0 \text{ m} \times 3.606$	= 1.136	
2. TOP CONCRETE		
$W = 5.90 \text{ m}^3 / 10.0 \text{ m} \times 4.794$	= 2.828	
3. PARTITION WALL (A)		
$W = 1.362 \text{ m}^3 / 10.0 \text{ m} \times 3.493$	= 0.476	4.440 m ³

TYPE OF WORK : BOX CULVERT FOR REVETMENT
 LOCATION : RIGHT SIDE

CALCULATION		RESULT
FORM		
1. BASE CONCRETE		
$A = 13.240 \text{ m}^2 / 10.0 \text{ m} \times 3.606$	$= 4.774$	
2. TOP CONCRETE		
$A = 26.0 \text{ m}^3 / 10.0 \text{ m} \times 4.794$	$= 12.464$	
3. PARTITION WALL (A)		
$A = (3.818 + 3.168) \times 0.65 / 2 \times 2$	$= 4.541$	
TOTAL	$= 21.779$	21.779 m²
DEFORMED REINFORCING BAR		
1. BASE CONCRETE		
$W = 0.101 \text{ tf} / 10.0 \text{ m} \times 3.606$	$= 0.036$	0.036 tf
2. TOP CONCRETE		
$W = 0.162 \text{ tf} / 10.0 \text{ m} \times 4.50$	$= 0.073$	0.073 tf
3. PARTITION WALL		
$W = 0.093 \text{ tf} / 10.0 \text{ m} \times 3.493$	$= 0.032$	0.032 tf
JOINT FILLER		
1. BASE CONCRETE		
$A = 0.315 \text{ m}^2 / \text{place} \times 1$	$= 0.315$	0.315 m²
2. TOP CONCRETE		
$A = 4.95 \text{ m}^2 / 10.0 \text{ m} \times 4.5$	$= 2.228$	2.228 m²
3. PARTITION WALL		
$A = 3.250 \text{ m}^2 / 10.0 \text{ m} \times 3.493$	$= 1.135$	1.135 m²

TYPE OF WORK : BOX CULVERT FOR REVETMENT
 LOCATION : RIGHT SIDE

CALCULATION		RESULT
WEEP HOLE		
PVC PIPE ϕ 50		
n = 2		
l = 0.65		
L = 2 x 0.65	= 1.300	1.300 m
FILTER CLOTH		
A = 0.64 m ² / place x 2	= 1.28	1.280 m ²
GRAVEL BEDDING		
1. REVETMENT		
A = (2.6 + 2.9) x 0.3 / 2	= 0.825	
V = 0.825 x 3.45	= 2.846	
2. BASE CONCRETE		
V = 0.800 m ³ / 10.0 m x 3.864	= 0.309	
3. GRAVITY WALL		
A = (1.3 + 1.4) x 0.1 / 2	= 0.135	
V = 0.135 x 3.535	= 0.477	
TOTAL	= 3.602	3.602 m ³
WET STONE MASONRY		
A = (3.111 + 2.121) x 0.35 / 2	= 0.916	
V = 0.916 x 3.45	= 3.16	3.160 m ³

TYPE OF WORK : BOX CULVERT FOR REVETMENT
 LOCATION : RIGHT SIDE

CALCULATION		RESULT
GRAVITY WALL		
$A = (0.4 + 1.175) \times 1.550$	= 2.441	
$V = 2.441 \times 3.533$	= 8.624	8.624 m ³
CEMENT MORTAR POINTING		
$L_1 = 3.111$		
$A_1 = 3.111 \times 3.45$	= 10.733	
$L_2 = 1.0 + 0.4$	= 1.4	
$A_2 = 1.4 \times 3.533$	= 4.946	
$A = A_1 + A_2$	= 15.679	15.679 m ²
CONCRETE TYPE C1		
1. BASE CONCRETE		
$V = 3.150 \text{ m}^3 / 10.0 \text{ m} \times 3.864$	= 1.217	
2. PARTITION WALL		
$A = (2.461 + 3.111) \times 0.65 / 2$	= 1.811	
$V = 1.811 \times 0.3$	= 0.543	
FORM		1.760 m ²
1. BASE CONCRETE		
$V = 13.240 \text{ m}^3 / 10.0 \text{ m} \times 3.864$	= 5.116	
2. PARTITION WALL		
$A = (2.461 + 3.111) \times 0.65 + 2 \times 2$	= 3.622	
TOTAL	= 8.738	8.738 m²

TYPE OF WORK : BOX CULVERT FOR REVETMENT
 LOCATION : LEFT SIDE

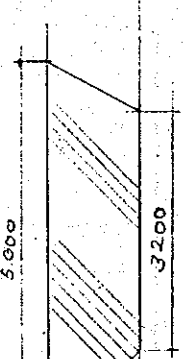


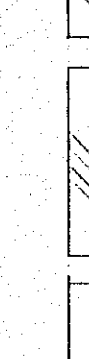
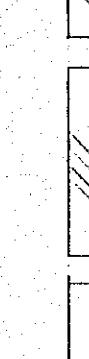
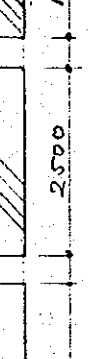
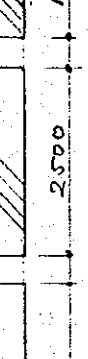
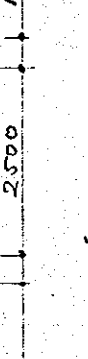
CALCULATION	RESULT
STRUCTURAL EXCAVATION	
$A = \{(0.8+2.2) \times 0.9 / 2 + 1.1 \times 1.1 / 2 + 0.9 \times 1.1\}$ $\times 2 + (5.0+2.8) \times 1.2 / 2$	= 10.57
$L = (3.0+2.0) / 2$	= 2.50
$V = 10.57 \times 2.50$	= 26.425
	26.425 m ³
BACKFILL WITH SELECTED SOIL	
$A = (1.9+0.5) \times 1.4 / 2 \times 2 + (3.0+2.0) \times 0.5$ $/ 2 + 2.0 \times 0.7$	= 4.33
$V = 4.33 \times (3.0+2.0) / 2$	= 10.825
	10.825 m ³
GRAVEL BEDDING	
1. REVETMENT	
$A = 0.3 \times 3.1 + 0.3 \times 0.3 / 2$	= 0.975
$L_1 = (2.1+1.3) / 2$	= 1.700
$L_2 = (4.0+4.2) / 2$	= 4.100
$V = 0.450 \times 3.168 \times 2 / 10$	= 0.285
2. TOP CONCRETE	
$V = 0.540 \times (1.474 + 4.560) / 10$	= 0.326
2. BASE CONCRETE	
$V = 0.800 \times (2.698 + 3.794) / 10$	= 0.519
3. PARTITION WALL	
$V = 0.450 \times 3.168 \times 2 / 10$	= 0.285
TOTAL	= 6.785
	6.785 m ³

TYPE OF WORK : BOX CULVERT FOR REVETMENT
 LOCATION : LEFT SIDE

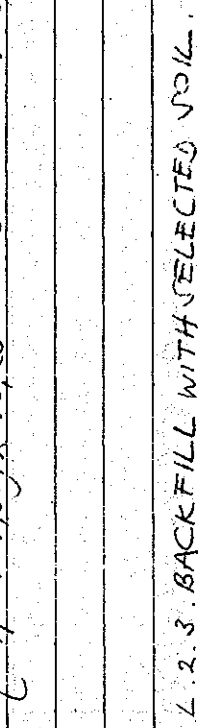
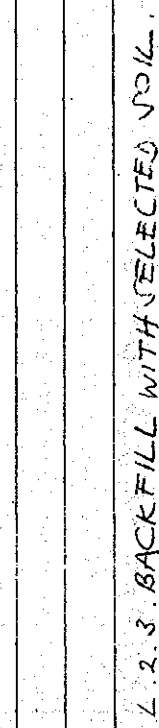
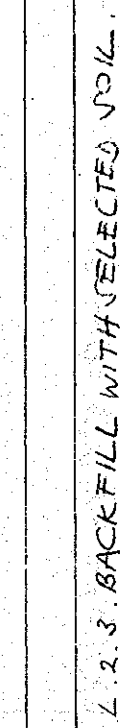
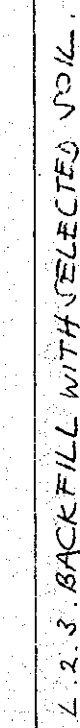
CALCULATION		RESULT
WET STONE MASONRY		
$A = (3.4 + 3.8) \times 0.35 / 2$	= 1.26	
$V = 1.26 \times (1.7 + 4.10)$	= 7.308	7.308 m ³
CEMENT MORTAR POINTING		
$A = 3.800 \times (1.7 + 4.1)$	= 22.04	22.040 m ²
DEFORMED REINFORCING BAR		
1. BASE CONCRETE		
$W = 0.101 \text{ tf} / 10.0 \text{ m} \times (2.698 + 4.0)$	= 0.068	0.068 tf
2. TOP CONCRETE		
$W = 0.162 \text{ tf} / 10.0 \text{ m} \times (1.474 + 4.56)$	= 0.098	0.098 tf
3. PARTITION WALL		
$W = 0.093 \text{ tf} / 10.0 \text{ m} \times 3.493 \times 2$	= 0.065	0.065 tf
CONCRETE TYPE C1		
1. BASE CONCRETE		
$V = 3.150 \text{ m}^3 / 10.0 \text{ m} \times (2.698 + 4.0)$	= 2.110	
2. TOP CONCRETE		
$V = 5.900 \text{ m}^3 / 10.0 \text{ m} \times (1.474 + 4.560)$	= 3.560	
3. PARTITION WALL		
$A = (3.168 + 3.818) \times 0.65 / 2$	= 2.270	
$V = 2.270 \times 0.3 \times 2$	= 1.362	
TOTAL		7.032 m³

TYPE OF WORK : BOX CULVERT FOR REVETMENT
 LOCATION : LEFT SIDE

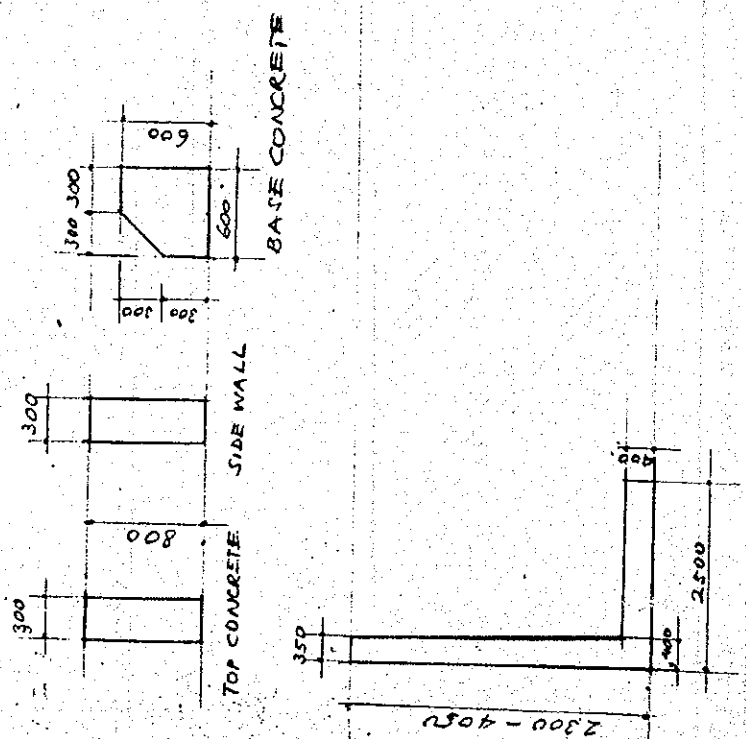
CALCULATION		RESULT
FORM		
1. BASE CONCRETE		
$A = 13.240 \text{ m}^2 / 10.0 \text{ m} \times (2.698 + 4.0)$	$= 8.868$	
2. TOP CONCRETE		
$A = 26.0 \text{ m}^2 / 10.0 \text{ m} \times (1.474 + 4.560)$	$= 15.688$	
3. PARTITION WALL		
$A = (3.168 + 3.818) \times 0.65 / 2 \times 2$	$= 4.541$	
TOTAL	$= 29.097$	29.097 m²
JOINT FILLER		
1. BASE CONCRETE		
$A = 0.315 \text{ m}^2 / \text{place} \times 2$	$= 0.63$	0.630 m²
2. TOP CONCRETE		
$A = 4.95 \text{ m}^2 / 10.0 \text{ m} \times (1.474 + 4.56)$	$= 2.987$	2.987 m²
3. PARTITION WALL		
$A = 3.250 \text{ m}^2 / 10.0 \text{ m} \times 3.493 \times 2$	$= 2.270$	2.270 m²
WEEP HOLE		
PVC PIPE ϕ 50		
$n = 3$		
$l = 0.65 \text{ m}$		
$L = 3 \times 0.65$	$= 1.950$	1.950 m
FILTER CLOTH		
$A = 0.64 \text{ m}^2 / \text{place} \times 3$	$= 1.92$	1.920 m²

TYPE OF WORK:	L. 2. ASSEMBLING WORK	CALCULATION	RESULT
LOCATION:	SIMONGAN WEIR	L. 2.1 STRUCTURAL EXCAVATION.	
L. 2.1		$15,00 + 3,20 / 2 * 1,25 + 0,63 * 1,25 // * 13,50 = 79,80$	
SECT. D-D		$150 + 2,75 + 2,50 + 1,50 // * 0,65 + 0,325 * 0,65 // * 7,50$	
		$+ 0,325 * 0,65 // * 8,25$	
		$0,35 * 0,30 // + 0,35 * 0,175 // * 75,00 = 12,50$	
SECT. A - A		$150 * 1,50 // * 0,65 + 0,325 * 0,65 // * 7,50$	
		$+ 0,325 * 0,65 // * 3,00 = 13,20$	
SECT. B - B		Total	149,00m ³
SECT. C - C			



2

TYPE OF WORK:	L 2 ASSEMBLING WORK	CALCULATION	RESULT
LOCATION:	SIMONGAN WEIR		
L 2.2		L 2.2. EARTH FILL $(3,75 \times 5,50) \times 16,20 = 33,900$	33,900m ³
L 2.3		L 2.3. BACKFILL WITH SELECTED SOIL. $(0,325 \times 0,65) \times (7,50 + 0,25) = 3,40$ $(0,35 \times 0,175) \times 7,50 = 4,60$ $(0,325 \times 0,65) \times (7,50 + 3,00) = 2,20$ $(0,50 + 1,75) / 2 \times 1,25 \times 13,50 = 19,30$ $(0,60 + 1,20) / 2 \times 1,00 \times 2,60 = 2,50$ $(0,5 + 0,8) \times 0,40 \times 3,00 + (0,5 + 0,8) \times 0,40 \times 2,60 = 3,00$	32,50m ³
L 2.4		L 2.4 RUBBLE STONE BEDDING $(0,15 \times 3,20) \times 15,50 = 7,50$	7,50m ³
L 2.5		L 2.5. BACK FILL WITH GRAVEL. $(1,00 \times 1,25) + (0,50 \times 3,35) \times 13,50 = 32,80$	32,80m ³

TYPE OF WORK: LOCATION:	L2 ASSEMBLING WORK SIMONGAN WEIR.	CALCULATION	RESULT
L. 2. 6		L. 2. 6 LEVELING CONCRETE TYPE E $21,00 \times 9,00 \times 0,15 = 28,40$ $3,65 \times 9,50 \times 0,15 = 5,20$ $1,00 \times 12,00 \times 0,15 = 1,80$ $4,35 \times 7,40 \times 0,15 = 4,80$ $3,65 \times 10,80 \times 0,15 = 5,90$	
		Total	460014
		L. 2. 7 CONCRETE TYPE C1 INCLUDING FORMWORK $(0,30 \times 0,80) \times 2,60 = 0,65$ $(0,30 \times 0,80) \times (6,90 + 0,60) \times 2 = 3,60$ $((0,30 + 0,60) / 2 \times 0,30 + (0,30 \times 0,60)) \times 2,60 = 0,55$	
		$((2,30 + 4,45) / 2 \times (0,35 + 0,40) / 2) \times 3,625 \times 2 = 6,25$ $(2,10 \times 0,40) \times 3,625 \times 2 = 4,41$	
		$(0,35 + 0,40) \times 0 \times 3,65 \times 3,00 \times 2 = 8,213$	
		$(2,10 \times 0,40) \times 3,00 \times 2 = 5,040$	
		TOTAL = 28.713	28.713m ³

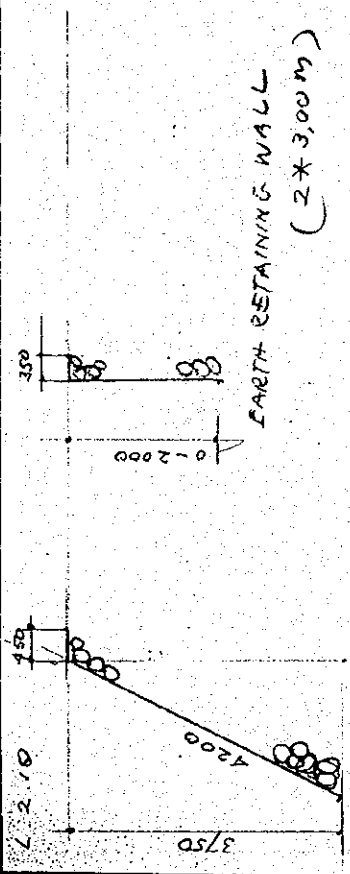


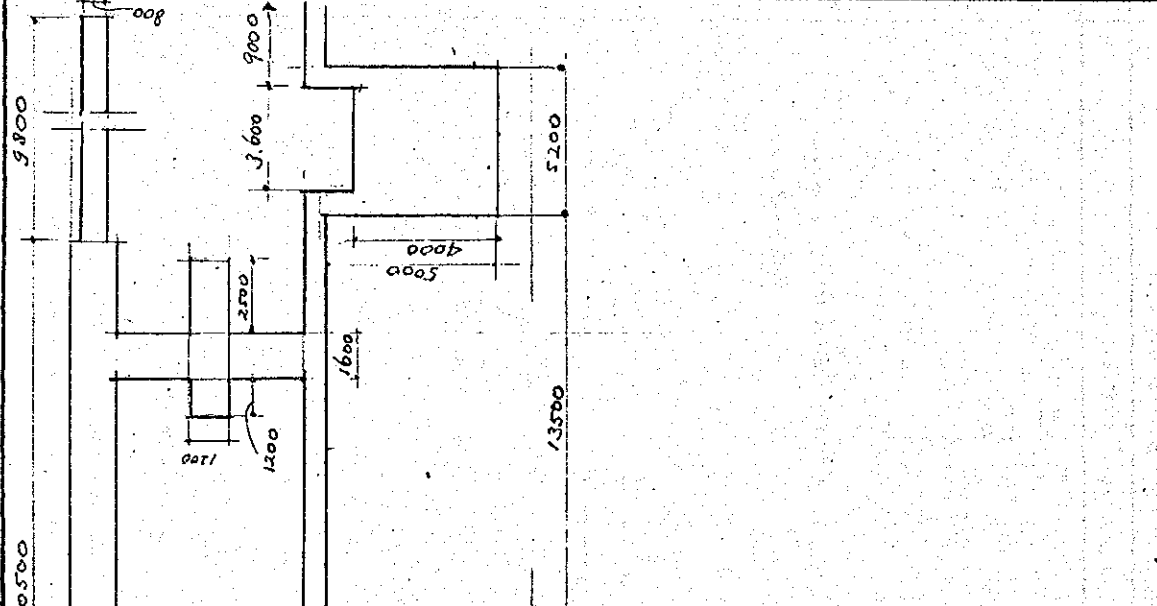
TYPE OF WORK:	2.2 ASSEMBLING WORK		RESULT
LOCATION:	SIMONIAN WEIR		CALCULATION
	<p>2.2.8 DEFORMED REINFORCING BARS.</p> <p>$\phi 13$ $12 \times 2,60 \times 1,04 = 32,76$</p> <p>$2 \times 6 \times 7,50 \times 1,04 = 93,60$</p> <p>$\phi 10$ $10 \times 1,90 \times 0,617 = 11,75$</p> <p>$10 \times 1,95 \times 0,617 = 12,10$</p> <p>$2 \times 26 \times 1,90 \times 0,617 = 61,00$</p> <p>$\phi 13$ $10 \times 7,50 \times 1,04 = 78,00$</p> <p>$26 \times 2,60 \times 1,04 = 70,30$</p> <p>$\phi 16$ $10 \times 8,35 \times 1,58 \times 2 = 263,90$</p> <p>$10 \times 1,90 \times 1,58 \times 2 = 60,00$</p> <p>$\phi 13$ $12 \times 6,35 \times 1,04 \times 2 = 158,50$</p> <p>$2 \times 10 \times 5,60 \times 1,04 \times 2 = 233,00$</p> <p>$2 \times 6 \times 4,20 \times 1,04 \times 2 = 107,20$</p> <p>$2 \times 6,00 \times 1,04 \times 2 = 25,00$</p> <p>$\phi 16$ $2 \times 20 \times 2,40 \times 1,58 \times 2 = 303,40$</p> <p>$\phi 13$ $2 \times 11 \times 5,60 \times 1,04 \times 2 = 256,20$</p> <p>$2 \times 12 \times 3,40 \times 1,04 \times 2 = 119,80$</p> <p>Total</p> <p>188630kg</p>		

TYPE OF WORK:	L 2 ASSEMBLING WORK	CALCULATION	RESULT
LOCATION:	SIMONGAN WEIR WET STONE MASONRY	L 2.9 WET STONE MASONRY	
		AREA OF LEVELING CONCRETE $2,100 \times 9,00 = 18,900 \text{ M}^2$ $3,65 \times 9,50 = 34,775 \text{ M}^2$ $1,00 \times 12,00 = 12,00 \text{ M}^2$ $9,35 \times 7,40 = 32,20 \text{ M}^2$ $3,65 \times 10,80 = 39,40 \text{ M}^2$ $307,30 \text{ M}^2$	
		WET STONE MASONRY FOR PRESERVATION FLOOR $((38,20 \times 20,90) - 307,30 - (7,90 \times 27,90)) \times 0,25 = 67,30$	
		LEAVING WALL $((0,45 + 1,30) / 2 \times 4,05 + (0,80 \times 2,00)) \times 13,50 = 69,50$	
		RETAINING WALL $((0,35 + 1,60) / 2 \times 2,00 \times 3,00 / 2) + ((1,60 + 1,75) / 2 \times 0,30 \times 3,00) \times 2 = 9,00$	
		Total $145,80 \text{ M}^2$	$145,80 \text{ M}^2$

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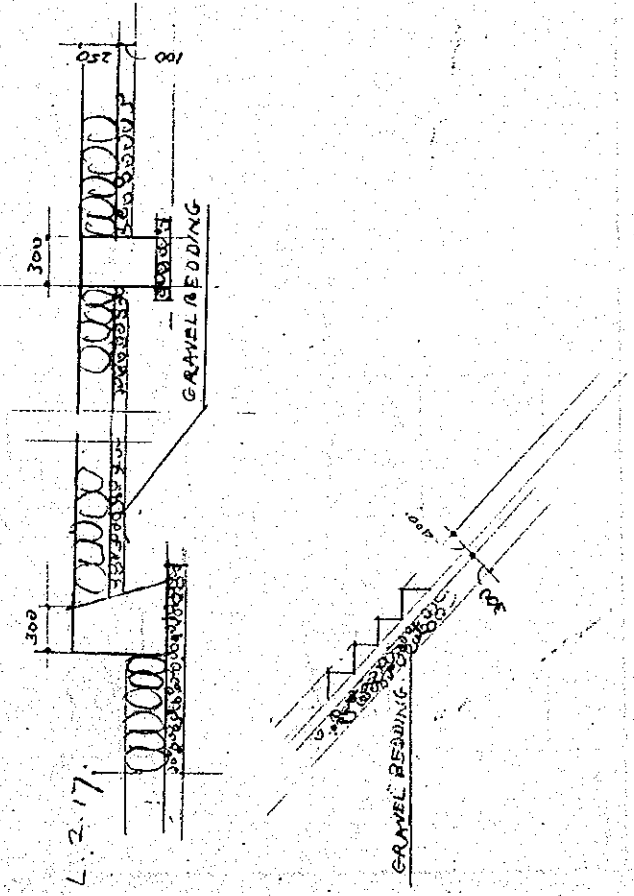
TYPE OF WORK:	L 2 ASSEMBLING WORK	RESULT
LOCATION:	L 2.10. CEMENT MORTAR POINTING ON THE SURFACE OF MASONRY.	
L 2.10	$(420 + 0.45) \times 13.50 = 62.80$ $(2.00 + 0.35) \times 3.00/2 \times 2 = 7.20$	70.00m
	Total	
	L 2.11 JOINT FILLER, 10MM THICK (ELASTIC MATERIAL)	
	$(0.40 \times 3.60) + (0.37 \times 2.60) = 3.20$ $(0.35 \times 3.75) \times 2 + (0.35 \times 3.00) \times 2 = 4.30$	6.50m ²
	Total	
	L 2.12 STEEL FENCE (GALVANIZED), H = 110cm	
	$(2.75 + 6.75) \times 2 = 19.00$ $(2.00 + 2.30 + 4.70) \times 2 = 13.00$ $12.80 + 4.40 + 5.80 = 23.00$	52.00m
	Total	



TYPE OF WORK :	CALCULATION		RESULT
LOCATION :	L.2.13. ASSEMBLING BLOCKS INTO ORIGINAL		
	SHAPE INCLUDING SCAFFOLDING		
		$(1,60 \times 20,50) + (2,80 \times 9,80)$	= 40,60
		$(6,20 \times 1,60) + (1,20 \times 3,70)$	= 14,50
		$(7,70 + 13,50 + 1,00) \times 9,80$	= 17,80
		$(9,00 \times 5,20)$	= 20,80
		$(1,00 + 9,00) \times 0,80$	= 8,00
			101,70
		$(2 \times 20,50) + 1,60 + (2 \times 9,80) + 0,80 = 63,00 \text{ m}'$	
		$(2 \times 6,20) + (2 \times 3,70) + (2 \times 1,20) = 23,20 \text{ m}'$	
		$(2 \times 7,70) + (2 \times 13,50) + 0,80 = 43,20 \text{ m}'$	
	$4,00 + 5,20 + 3,60$	= 12,80 m'	
	$2 \times 9,00$	= 18,00 m'	
	$9,25 \times 15,20 \text{ m}' = 67,60$		
	Total	778,00 m ²	

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TYPE OF WORK:	CALCULATION	RESULT
LOCATION:	L 2.14. JOINTING BLOCKS WITH NON-SHRINKAGE MORTAR	
L 2.14. & L 2.15.	NON MORTAL SHRINKAGE: $175 \times 0,02 = 3,50$	3,50 m ³
L 2.15.	NON MORTAL SHRINKAGE FOR 18 BLOCK = $0,02 m^3$ DRILLING HOLE (DIA 45 mm) IN THE 1 BLOCK = $4,00 m^3$	
L 2.17.	L 2.15 DRILLING HOLE (Ø 45 mm) IN THE BLOCK ANCHORING WITH STEEL DEFORMED BAR (Ø 16) AND FILLING THE HOLE WITH NON-SHRINKAGE MORTAR $175 \times 4,00 m = 700 m^3$	700 m ³
L 2.17.	L 2.17. GRAVEL BEDDING $138,20 \times 20,40 - 307,30 - (7,40 \times 27,40) \times 0,10 = 2690$ $6,30 \times 2,60 \times 9,50 = 7,50$	34,40 m ³
Total	Total	34,40 m ³



TYPE OF WORK:	CALCULATION	RESULT
LOCATION:	L 2 18 CONCRETE TYPE D INCLUDING FORMWORK	
L 2 18	$\left(\frac{0.30 + 0.50}{2} \times 9.60 \right) \times (12.00 + 3 \times 3.00) = 5,350.$	
	$(0.30 \times 0.50) \times 9.60 = 14.50$	
	$\left(\frac{0.70 \times 0.40}{2} \right) \times (0.366 \times 0.50) + (8.00 \times 0.366 - 0.57) \times 2.60 = 7.50.$	
	$(0.50 \times 7.00 \times 7.50) = 26.50$	
	$(0.50 \times 3.00 \times 10.00) = 15.00$	
	Total	69.00m ³

