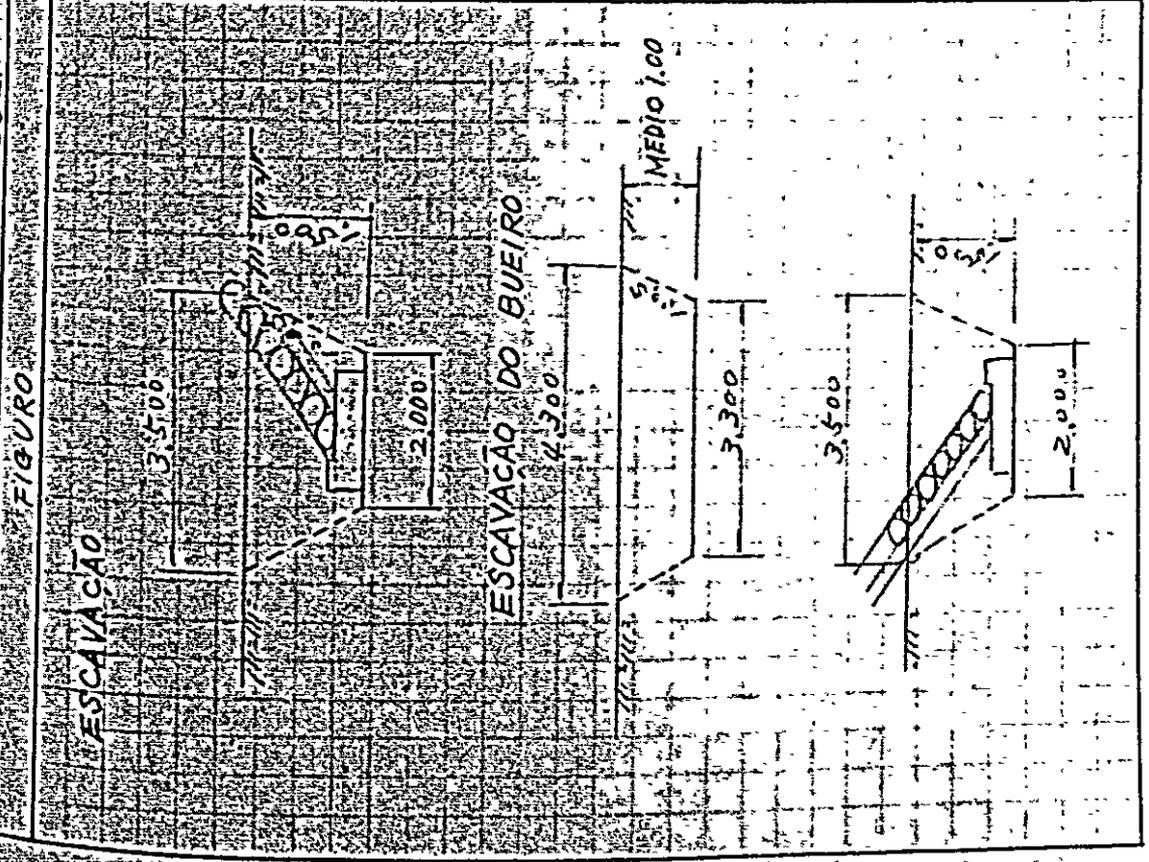


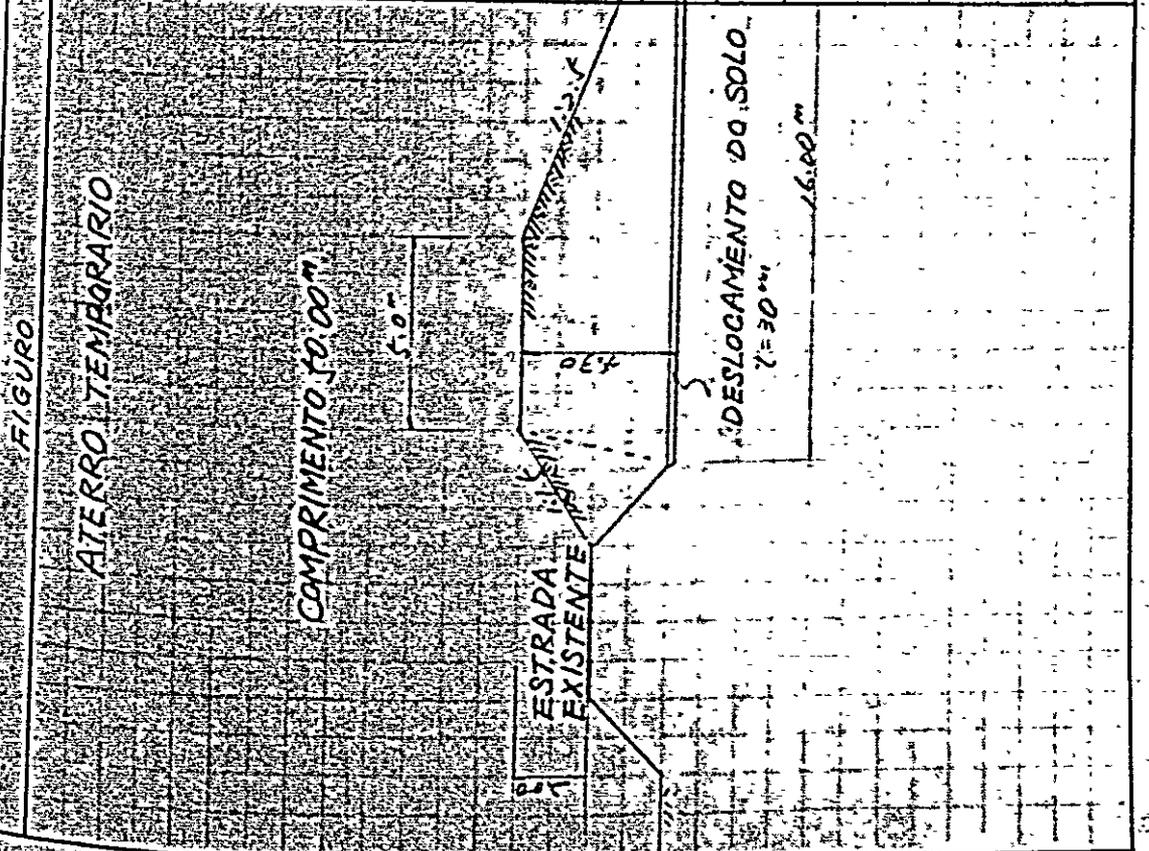
CALCULO DO SOLO

NOME	DIVISAO	CALCULO	QUANT.
ESCAVAÇÃO DO BASE		$(2,0 \times 3,5) \frac{1}{2} \times 1,5 \times 43,91 =$	593,6
ESCAVAÇÃO DO BUEIRO		$(3,3 + 4,3) \frac{1}{2} \times 1,00 \times (4,0 + 2,0) =$	136,8
ESCAVAÇÃO DO BASE		$(3,0 + 3,5) \frac{1}{2} \times 1,5 \times 80,0 =$	330,0
TOTAL			1060,4



3.9 ATERRO TEMPORARIO

NOME	DIVISÃO	CALCULO	QUANT.
DESTOCAMENTO		$0,30 \times 14,00 \times 50,00 =$	240,00
ATERRO EXTERNO		$0,5 \times (5,0 + 16,00) \times 2,30 \times 50,00 =$	257,50
		$0,5 \times 4,31 \times 2,5 \times 50,00 =$	268,75
	TOTAL		766,25

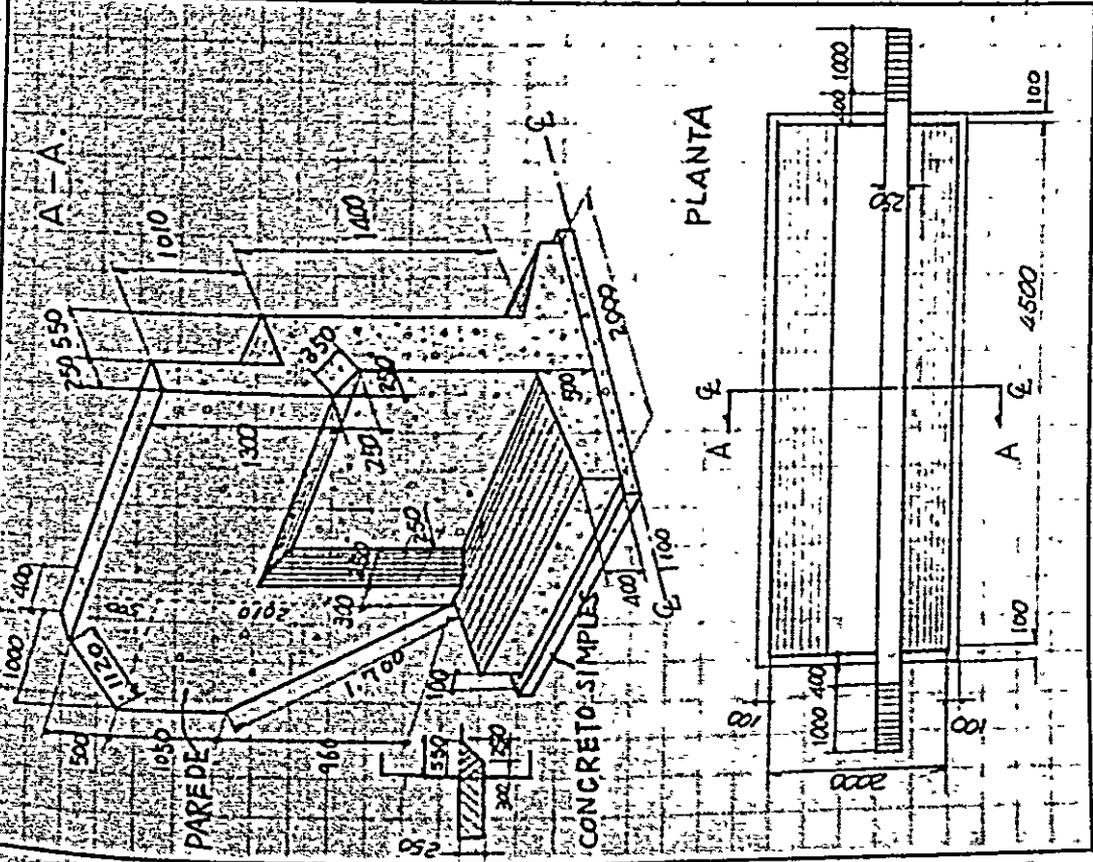


2.10 PONTE DE CONCRETO ARMADO

CONCRETO SIMPLES	m ³	2.068			
CONCRETO ARMADO		41.237			
CONCRETO ASFALTO		2.354			
ARGAMASSA	m ²	0.016			
FORMAS	m ²	2.176			
CONCRETO SIMPLES		84.60		φ 3/8"	278.50
BASE					
PONTE		107.27		φ 1/2"	147.10
FERRAGEM		4.975		φ 5/8"	3.217.86
BORRACHA (300x200x12)		4 UN.		φ 1"	622.60
ANGORA (φ 1" L=400)		4 UN.		φ 1/8"	709.86
ELASTICO (t=20)	m ²	5.93			
TUBO PARA DRENAGEM (φ 100 L=500)		4 UN.			
TUBO DE FERRO (φ 2")	kg	100.47 (18.92)			
(φ 1 1/2")	"	73.60 (18.92)			
PEDRA	m ³	0.54			

BASE

FIGURO



NOME	DIVISÃO	CALCULO	QUANT.
CONCRETO SIMPLES		$(4.70 \times 2.20 \times 0.10) \times 2$	
TOTAL		$=$	2.068
CONCRETO ARMADO		$(2.00 \times 0.40 + 2.00 + 0.55) \times 2$	
BASE		$(0.10) \times 4.50 = 4.176$	
PAREDE		$0.55 \times 1.40 \times 4.50 = 3.465$	
PAREDE		$\frac{1.30 + 1.55}{2} \times 0.25 \times 4.50 = 1.602$	
PAREDE		$\left\{ \left(\frac{0.40 + 1.40}{2} \times 0.50 + \frac{1.05 + 2.01}{2} \times 1.40 \right) \times 0.25 + \left(\frac{0.30 + 0.55}{2} \times 0.25 \times 0.96 \right) \right\} \times 2 = 1.500$	
TOTAL		$(4.176 + 3.465 + 1.602 + 1.500) \times 2 =$	21.486

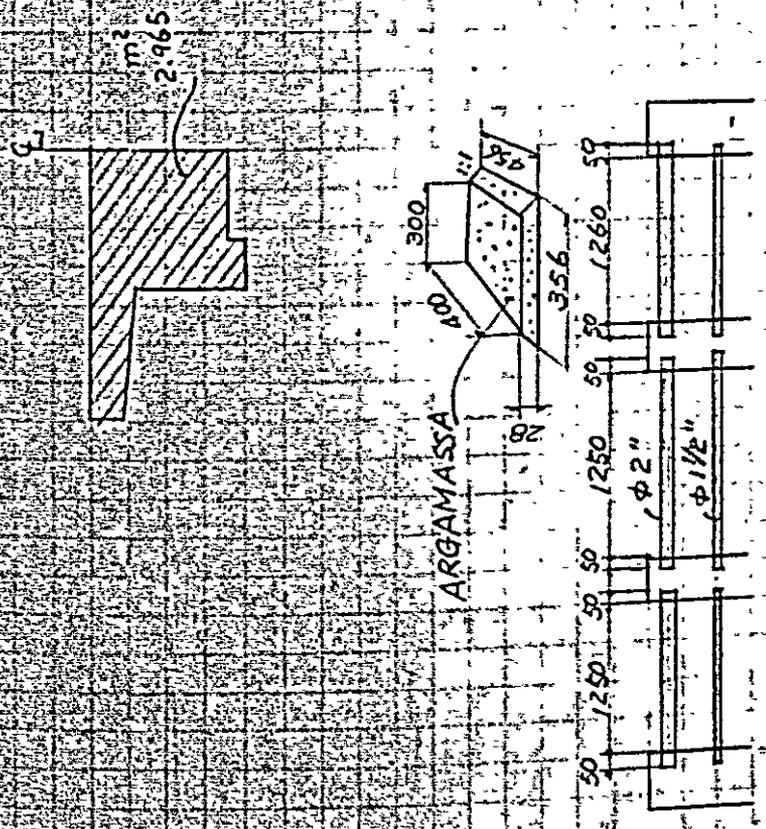
BASE

FIGURO	NOME	DIVISÃO	CALCULO	QUANT.
	FORMAS	CONCRETO SIMPLES	$(4.70 \times 2 + 2.20 \times 2) \times 0.10 \times 2$	
		TOTAL	=	2.76
		FRONTAL	$(1.01 + 1.40 + 0.40) \times 4.50 + \frac{(0.40 + 1.40)}{2} \times 0.50 + \frac{1.05 + 2.01}{2} \times 1.40 \times 2$	
			= 17.83	
		POSTERIOR	$(1.30 + 0.35 + 0.86 + 0.40) \times 4.50 + \frac{1.05 + 2.01}{2} \times 1.40 + (0.35 - 0.25) \times 0.96 \times 2$	
			= 18.47	
		LADO	$\{ 0.25 \times (1.12 + 1.05 + 1.70) + (0.35 \times 0.96) + (1.40 \times 0.55 + (2.00 \times 0.40) +$	

FIGURA	NOME	DIVISÃO	CALCULO	QUANT
			$0.90 = 0.475$	
		TOTAL		19 751
	FORMA			
	PRATO		$0.15 + 0.15 + (0.30 + 1.18 + 0.68 + 0.25)$	
	VIGA		$+ 1.57 + 0.25 + 0.68 + 0.68 + 1.18 + 0.30$	
			$= 84.20$	
	VIGA TRANSVERSAL		$(0.66 + 0.58 + 0.25) \times 2.05$	
			$\times 2 + (0.58 + 0.25) \times 2 \times 2.05$	
			$= 9.51$	
	HAND RAIL		$0.25 \times 0.90 \times 4 \times 4 + 0.15 \times 0.90 \times 4 \times 12$	
		$= 10.08$		
FRONTAL		$(0.105 + 1.633) \times 2 = 3.48$		

NOME	DIVISÃO	CALCULO	QUANT.
	TOTAL		107,27 m ²
JUNTA ELASTICO L=20"	2 UN	$(\frac{0.15+0.24}{2} \times 1.175 \times 2) + 0.45 \times 0.92 \times 2 + 2.05 \times 0.82$	5,93 m ²
BORRACHA	300 x 200 x 12		4 UN
ANCORA	Φ" L=400		4 UN
ARGAMASSA		$(0.30 \times 0.40 + 0.356 \times 0.456) \times \frac{1}{2} \times 0.028 \times 4$	0,016 m ³
TUBO DE PVC		Φ 3.94" (10cm) L = 500	4 UN
TUBO DE FERRO Φ 2"		$\frac{18}{m} \times (1.35 \times 6 + 1.36) \times 2$	18,92 m ³ 100,47
"	Φ 1 1/2"	$\frac{8}{m} \times 18.92$	18,92 m ³ 7,360
PEDRA		0.30 x 0.20 x 4.50 x 2 UN	0,54 m ³

FIGURO



17) TABELAS DE QUANTIDADE

DIVISÃO PONTO	CONCRETO SIMPLES	CONCRETO SEGUNDO	FORMAS (FRONTAL)	FORMAS (POSTERIOR) CON. SIMPLS. CON. SEGUNDO	FORMAS PARA FORMAS PARA OUTRO FORMAS	TERRAGEM
PAREDE DE ENTRADA	70628	8839	110,55	148,06	6,74	5.893,78
ENTRADA	58316	3141	129,29	68,44	0,90	3.992,16
CAIXA DE BOMBA USUAL	15.590	4.985	250,13	178,44	2,82	3.61 7.694,52
TUBO DE DESCARGA USUAL	19.851	1.656	37,04	35,88	1,38	1.372,57
CAIXA DE ELEVACÃO	50.735	1.782	127,85	158,36	1,82	(F) 2,66 (P) 2,66 4.231,87
TUBO DE DESCARGA	11.009	7.810	135,98	116,09	7,39	1,64 7.218,93
PAREDE DE SAIDA	11.571	1.861	21,40	32,40	0,98	1,21 788,43
TOTAL	947.670	30.667	812,24	815,67	22,01	5,32 8,54 31.142,26

2) CALCULO DO QUANTIDADE DE

FIGURO	NOME DE ENTRADA	DIVISAO	CALCULO	QUANT.
<p>CONCRETO ESQUERDA 172,54 DIREITA 178,54 TOTAL 351,08</p>	PAREDE DE ENTRADA	CONCRETO	$\frac{(2200 + 0.400)}{2} \times 1.500 + \frac{0.400 \times 1.900}{2}$	
			$0.700 + \frac{(0.300 + 0.400)}{2} \times 1.900$	
			41.000×0.400	70,828
		TOTAL		70,828
		CONCRETO SIMPLES		0,654
				0,180
		TOTAL		0,834
		FORNIA (FRONTAL)		110,55
		SUB TOTAL		110,55
		(PRESTIÇOS)		
			$\frac{(0.200 + 0.400)}{2} \times 1.500 + \frac{(0.400 \times 1.900)}{2}$	
			$0.700 + \frac{(0.300 + 0.400)}{2} \times 1.900 +$	
			$0.400 \times 0.400 \times 2$	4,12
			$(3.506 + 0.300) \times 0.700$	110,73
			$(0.100 + 0.600) \times 0.700$	36,05

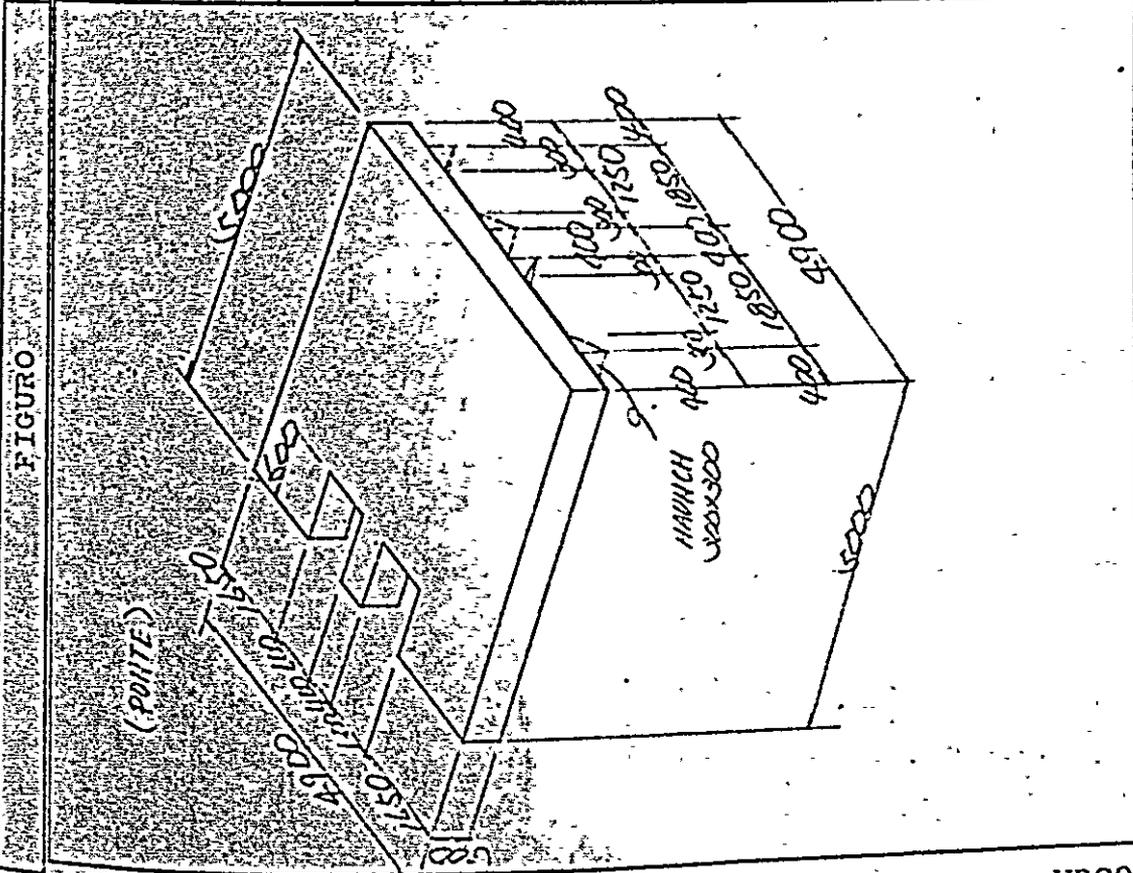
FIGURO	NOME	DIVISAO	CALCULO	QUAN.
			$0.500 \times 0.400 \times 2$	0.40
		TOTAL		142.06
		FORMAS PARA CON. SIMPLES	$(0.100 + 0.100) \times (10.700 + 0.200)$	
			$(0.200 + 0.200) \times 0.100 \times 2$	6.74
		TOTAL		
	TOTAL			
	CONCRETO			20.525
	CONCRETO SIMPLES			8.205
	FORMAS FERRAMENTAL			
	FORMAS			116.50
	FORMAS PARA			142.06
	CON. SIMPLES			1.74

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.	
<p>(PAREDE LADO)</p>		SUB TOTAL		14	
		OUTRO FORMAS	$0,300 \times 2 \times 0,900$		2
		TOTAL			16
		TRABAS PARA			
		CON. SIMPLES	$(1,250 + 3,426) \times 0,100 \times 2$		0,90
		TOTAL			0,90
		2 PAREDE (LADO)	CONCRETO	$0,300 \times 0,300 \times \frac{1}{2} \times (3,300 + 3,426)$	
				$0,300 \times 3,450 \times 0,400$	
				$\frac{(3,300 + 3,450)}{2} \times 3,750 \times 0,900$	
				$0,150 \times 0,100 \times 3,300$	
		SUB TOTAL	$10,685 \times 2$	21,370	
	(CENTRO)		$\frac{3,141}{4} \times 0,400^2 \times 3,300 \times \frac{1}{2}$	0,207	
			$0,300 \times 3,250 \times 0,400$	0,400	
			$\frac{(3,300 + 3,450)}{2} \times 3,750 \times 0,400$	5,100	
			$0,150 \times 0,100 \times 3,300 \times 2$	0,000	

%

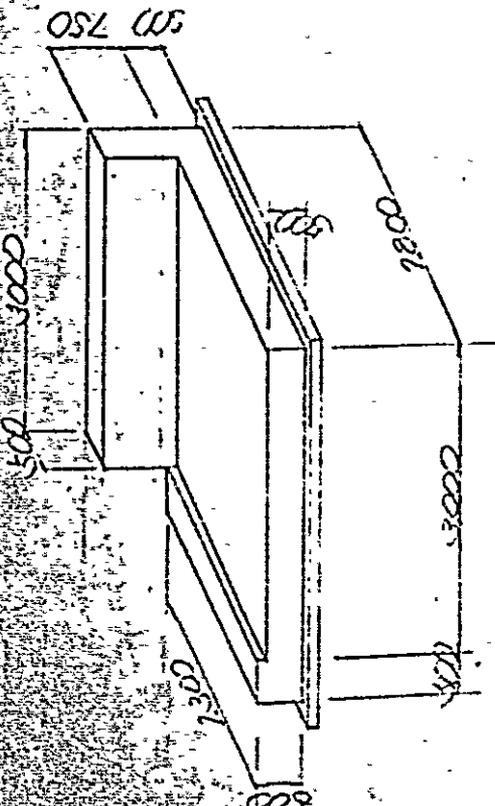
FIGURO	NOME	DIVISÃO	CALCULO	QUAN	
			$0.100 \times 0.100 \times \frac{1}{2} \times (3.100 + 3.500) \times 2$	0.587	
		SUB TOTAL		10.873	
		TOTAL		32.263	
		PARFEDS (CENTRAL)		$0.400 \times 1.300 \times 0.100 \times 2$	1.040
		(LADO)		$3.000 \times 3.300 + \frac{(3.000 + 3.500) \times 3.750}{2}$	7.549
				$0.150 \times 8.000 \times 2$	2.400
				$0.300 \times 1.2 \times (3.300 + 3.426)$	7.95
				$0.300 \times 0.500 \times \frac{1}{2} \times 2$	0.300
				0.300×5.000	1.500
			SUB TOTAL	27.46 x 2	54.92
		FORMAS (POSTERIAS)	$3.300 \times 3.250 + \frac{(3.300 + 3.500) \times 3.750}{2}$	76.10	
		SUB TOTAL	26.10 x 2	52.20	
		FORMAS (CENTRO)	$2 \times 3.100 \times 0.200 \times 3.300$	0.15	
			$3.000 \times 3.100 + \frac{(3.000 + 3.500) \times 3.750}{2}$		

FIGURA	NOME	DIVISÃO	CALCULO	QUAN.	
			3.750×2	7.500	
			$(0.150 + 0.100 \times 2) \times 3.300 \times 2$	2.311	
			$0.300 \times 1/2 \times (3.100 + 3.426) \times 2$	5.54	
			$0.300 \times 0.300 \times 1/2 \times 1.1 \times 2.7$	0.27	
			$- 0.300 \times (5.000 - 0.600) \times 2.7$	2.64	
		SUB TOTAL		146.12	
	PONTE	CONCRETO		$15.000 \times 4.900 \times 0.300$	2.250
				$0.300 \times 0.300 \times 1/2 \times 5.000 \times 2$	1.500
				$0.300 \times 0.300 \times 1/2 \times 4.400 \times 2$	0.396
				$- 2.600 \times 0.600 \times 0.300 \times 2$	0.216
		SUB TOTAL		2.28	
	FORMAS (FRONTAL)		$(5.000 \times 1.7 + 2.900) \times 0.300$	4.47	
			$1.600 \times 3 \times 0.300 \times 2.7$	1.13	



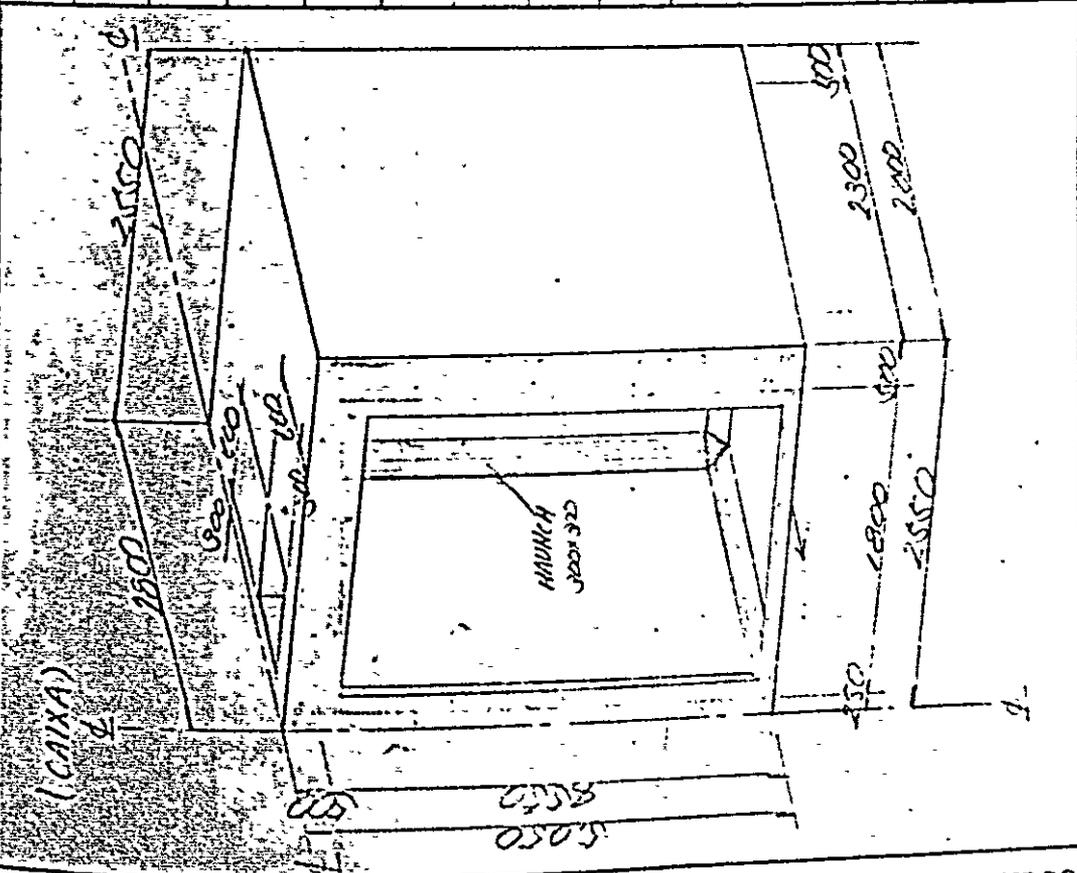
FIGURO	NO:ME	DIVISÃO	CALCULO	QUAN.
			$5.600 \times 1,250 \times 2$	12.500
			$0.600 \times 0.300 \times 2$	0.36
			$0.600 \times 0.300 \times 2$	0.36
			$(0.300 \times \sqrt{2} \times 5.600 + 0.300 \times 0.300 \times 1.2) \times 2$	4.33
			$5.300 \times \sqrt{2} \times 4.400 \times 2$	3.73
			$0.300 \times 0.300 \times 1/2 \times 4$	0.18
		SUB TOTAL		26.29
	ENTRADA TOTAL	CONCRETO	$18.073 + 2.263 + 7.980$	55.211
		CONCRETO SIMPLES	3.141	5.141
		FORMAS (CENTRAL)	$1.86 + 54.12 = 46.12 + 26.29$	129.29
		FORMAS (PRETERIOR)	$4.24 + 52.20$	66.44
		FORMAS FRACA		
		OUTRO SIMPLS	0.90	0.90
		OUTRO FORMAS	2.08	2.08

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.	
<p style="text-align: center;">CAIXA DE CASA DE BOMBA)</p>	CAIXA DE BOMBA	CASA DE CONCRETO	$5100 \times 8300 \times 0.500$	21.76	
	1. BASE		$\frac{(0.800 + 1.300) \times 0.500 \times 5.100}{2}$	2.070	
		SUB TOTAL		23.84	
		CONCRETO SIMPLES		4.055	
			$7100 + 0.800 \times 0.100$		
			$- 3.000 \times 0.600 \times 0.100$	- 2.150	
		TOTAL		3.875	
		FARMAS			
		(PASTERIAS)		$(0.500 + 0.500 + 0.500) \times 5.100$	7.65
				$(8.300 + 1.500) \times 0.500$	5.90
				$\frac{(0.800 + 1.300) \times 0.500 \times 2}{2}$	1.05
		SUB TOTAL		14.10	
		OUTRO		$0.500 \times 12 \times 5.100$	3.61
		FARMAS PIPA		$(7.600 + 0.850) + 5.300 \times 0.100$	1.20

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.	
<p>CAIXA DE BOMBA CENTRIFUGAL</p> 			$(11.700 \times 0.05) \times 0.100$	0.58	
		SUB TOTAL		1.012	
		CONCRETO	$2.000 \times 2.200 \times 0.500$		4.200
			$3.000 \times 0.500 \times 0.750$		1.125
			$0.600 \times 0.500 \times 2.500$		0.750
		SUB TOTAL			6.075
		CONCRETO			
		SMPLS	$(3.500 + 0.200) \times (2.500 + 0.100) \times 0.10$		1.111
		SUB TOTAL			1.110
		FORMAS (FRONTAL)	CALCULADO EM PAREDE		
			$(3.000 + 0.500 + 0.500) \times 1.250$		5.000
			$(0.600 + 0.500) \times 2.500$		2.530
			$0.600 \times 0.500 \times 2.7$		0.810

FIGURO	NONE	DIVISÃO	CALCULO	QUAN.	
<p>(MUNICHI)</p> <p>SEÇÃO DE CAIXA DE BOMBA CENTRIFUGAL</p> <p> $A = 0,078 \text{ m}^2$ $R_1 = 0,50$ $R_2 = 1,00$ </p>		FORMAS (FRONTAL)	$2,700 \times (0,950 \times 2 + 1,200) \times 2 =$	24,52	
			$3,950 \times 1,200 \times 2 =$	9,48	
			$1,500 \times 4 \times 0,500 =$	3,00	
			$10,300 \times \sqrt{2} \times (4,700 \times 4 + 1,200 \times 2 + 3,950 \times 2) \times 2 =$	24,69	
			$0,078 \text{ m}^2 \times 4 \times 2 =$	0,62	
		SUB TOTAL	FORMAS (POSTERIOR)	$(5,500 + 2,500) \times 5,050 =$	123,53
				$(12,550 \times 5,050) - (1,200 \times 9,550 + 10,300 \times 2,900 \times \frac{1}{2} \times 2) \times 2 =$	9,74
			SUB TOTAL	$210,141 \times 0,500 \times 0,500 \times 2 =$	10,51
				$=$	14,77

FIGURO



NOBRE	DIVISÃO	CALCULO	QUAN.
	FORMAS		
	(POSTERIOR)	$(2.300 + 2.000) \times 6.300$	33,39
		$1.300 \times (6.300 - 0.100)$	14,26
		$2 \times 2.141 \times 0.125 \times 0.500$	0,39
	SUB TOTAL		48,04
		$2.800 \times 2.550 \times 5.050$	
		$- 2.300 \times 1.800 \times 2.550$	
		$- 2.600 \times 0.600 \times 0.500$	
		$0.300 \times 0.300 \times \frac{1}{2} \times (2.300 - 0.600) \times 2$	
		$0.300 \times 0.300 \times \frac{1}{2} \times (1.800 - 0.600) \times 2$	
		$0.300 \times 0.300 \times \frac{1}{2} \times (2.550 - 0.600) \times 2$	
		$\frac{1}{3} \times 1^3 = \frac{1}{3} \times 0.300^3 \times 8$	
		$- 0.300 \times 0.300 \times \frac{1}{2} \times 0.600$	
	SUB TOTAL	$2 \text{ UFE} - 128,18 \times 2$	36,536

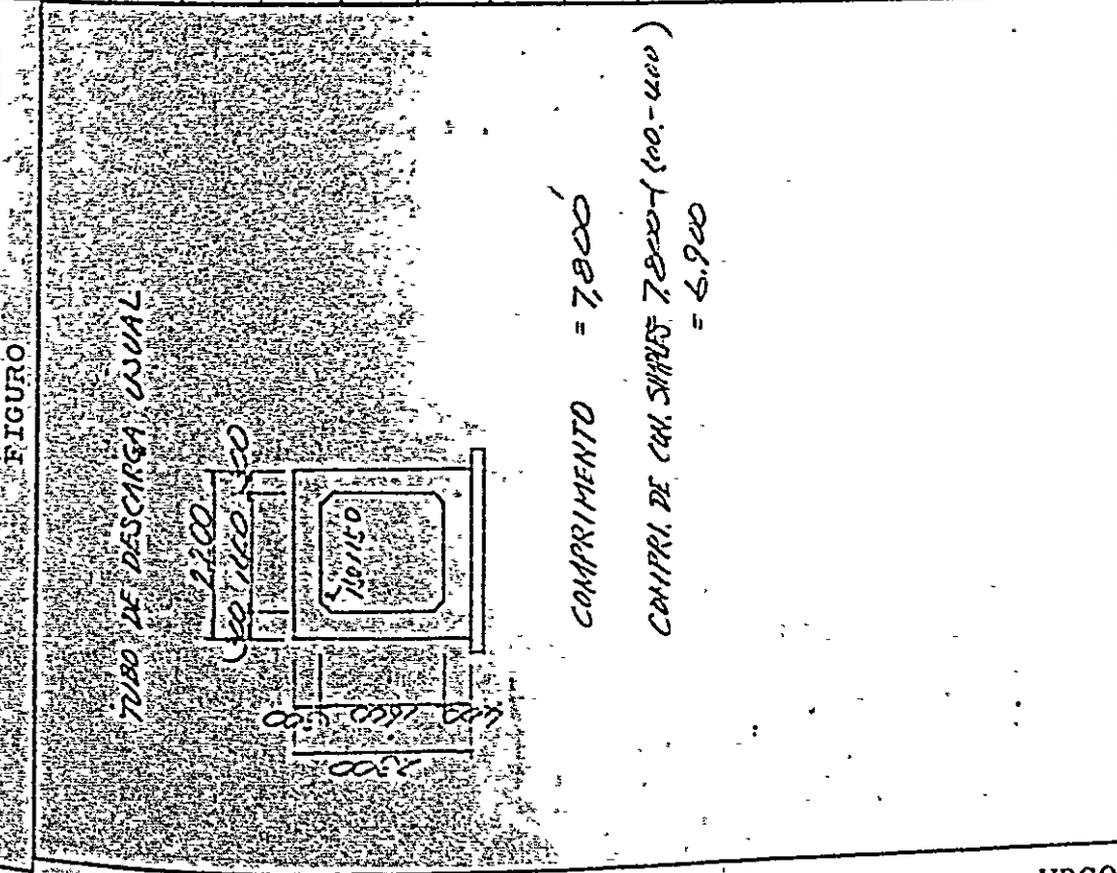
No.

JIRCO

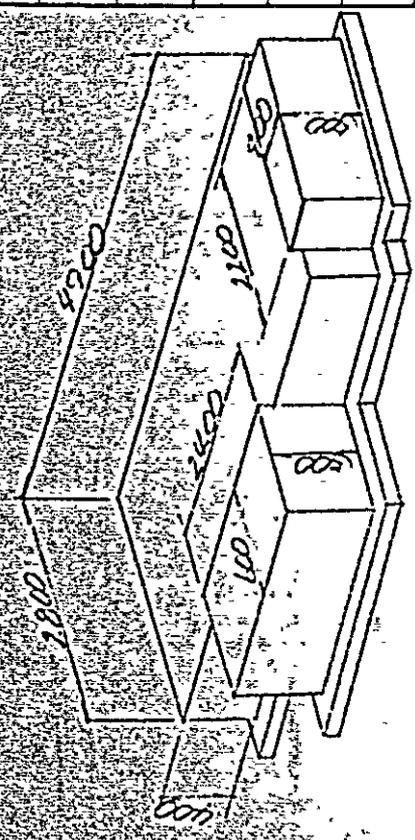
030

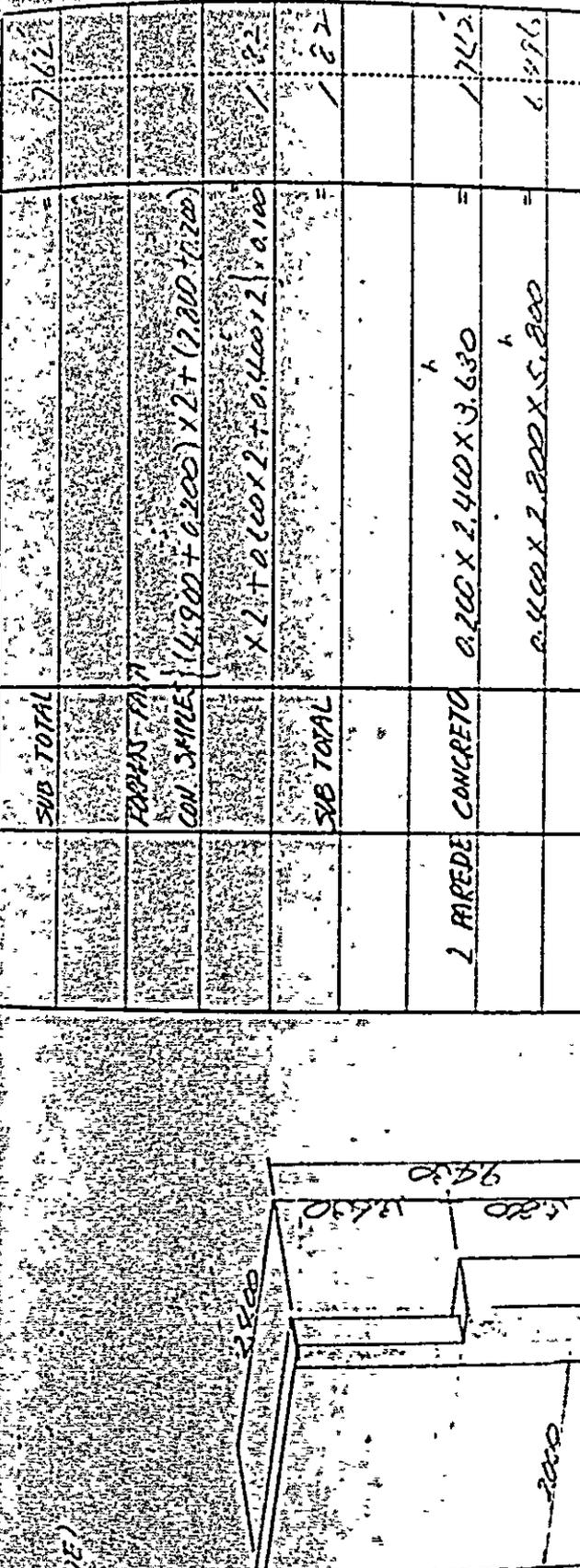
FIGURO	NOME	DIVISÃO	CALCULO	QUANT.
			$2.000 \times 0.100 \times 1.650$	0,44
		SUB. TOTAL		37,098
		FORMAS (FRONTAL)	$(2.550 - 0.600) \times (1.800 - 0.600) \times 2$	18,76
			$(2.550 - 0.600) \times (2.500 - 0.600) \times 2$	26,36
			$(1.800 - 0.600) \times (2.300 - 0.600) \times 2$	4,08
			$0.300 \sqrt{2} \times (2.300 - 0.600) \times 2$	5,77
			$0.300 \sqrt{2} \times (1.800 - 0.600) \times 2$	2,07
			$0.300 \sqrt{2} \times (2.550 - 0.600) \times 2$	10,41
			$0.078 \text{ m}^2 \times 16$	1,25
			$(0.300 \sqrt{2} \times 0.600 + 0.300 \sqrt{2} \times 0.600) \times 2$	0,15
		SUBTOTAL		74,25
		FORMAS (POSTERIOR)	$(2.800 + 2.550 \times 2) \times 5.050$	37,16
			2.800×4.900	10,72
			0.100×1.650	0,17

TIPO DE DESCARGA USUAL	NOME	DIVISAO	CALCULO	QUAN.
		CONCRETO	$(2,300 \times 3,200) - (1,100 \times 1,100)$	
			7,800	1/556
			$0,150 \times 1,500 \times 2$	1/556
		TOTAL		1/556
		CON. SAIRES	$(2,300 + 0,100) \times 6,900 \times 0,100$	1/556
		TOTAL		1/556
		FORMAS (FRONTAL)	$1,500 \times 9 \times 7,200$	3/052
			$0,150 \times 1,5 \times 47 \times 7,200$	6/52
		TOTAL		3/052
		FORMAS (POSTERIOR)	$2,300 \times 7,200 \times 2$	3/052
		TOTAL		3/052

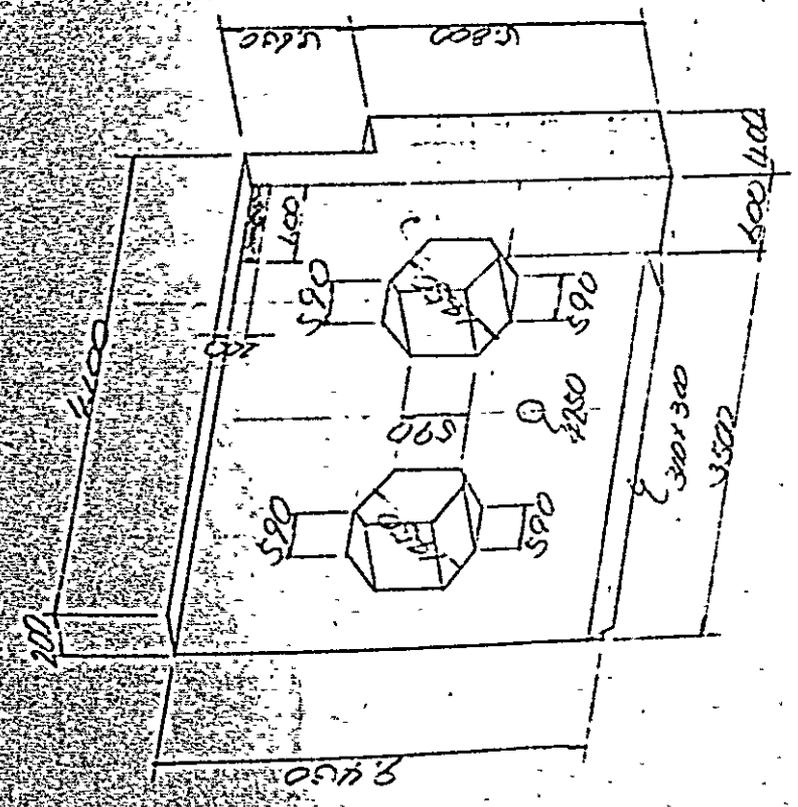


FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
CAIXA DE ELEVAÇÃO	CAIXA DE ELEVAÇÃO			
	1. BASE	CONCRETO	$2.800 \times 0.900 \times 0.400 =$	1.536
			$0.600 \times 2.400 \times 0.500 =$	0.720
			$0.400 \times 1.200 \times 0.500 =$	0.120
		SUB TOTAL		1.680
		CONCRETO SIMPLES	$(2.800 + 0.200) \times (4.900 + 0.200) \times 0.100 =$	1.536
			$(2.400 + 0.200) \times 0.600 \times 0.100 =$	0.144
			$(1.200 + 0.200) \times 0.400 \times 0.100 =$	0.096
		SUB TOTAL		1.776
		FORMAS (POSTERIOR)		
			$(4.900 + 2.800) \times 0.900 - 2.400 =$	1.200
			$(2.800 - 2.200) \times 0.400 =$	0.240
			$(0.600 \times 2 + 2.400) \times 0.500 =$	1.300
			$(0.400 \times 2 + 2.100) \times 0.500 =$	1.500



FIGURO	NOME	DIVISAO	CALCULO	QUAN.
 <p>(PAREDE)</p>		SUB TOTAL		762
		FORMAS (FRONTAL)	$(1.900 + 0.200) \times 2 + (2.200 - 0.200) \times 2 + 0.400 \times 2 + 0.400 \times 2 = 12.200$	
		SUB TOTAL		12.200
		2 PAREDE CONCRETO		$0.200 \times 2.400 \times 3.630 = 1.712$
				$0.400 \times 2.200 \times 5.200 = 4.576$
		SUB TOTAL		$0.300 \times 0.300 \times \frac{1}{2} \times (2.000 - 0.300) = 0.227$
				4.803
		FORMAS (FRONTAL)		$2.000 \times (9.450 - 0.300) = 18.26$
				$0.300 \times \frac{1}{2} \times (2.000 - 0.300) = 0.227$
		SUB TOTAL		18.487

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
(PAREDE)		FORMAS (POSTAL)	$2.800 \times 5.800 + 1.400 \times 3.600 =$	24,75
			$400 \times 5.200 \times 2 =$	4,14
			$0.200 \times 3.600 \times 2 =$	1,44
		SUB TOTAL		30,33
		CONCRETO	$0.200 \times 4.100 \times 5.630 =$	2,97
			$0.400 \times 4.100 \times 5.800 =$	1,70
			$0.300 \times 0.300 \times \frac{1}{2} \times (3.500 - 0.300) =$ $3,24 \times 0.250^2 \times 0.400 =$ $4.224 \times 0.590^2 \times 0.400 \times 2 =$	0,164
		SUB TOTAL		4,83
		FORMAS (FRONTAL)	$3.500 \times (1.430 - 0.300) =$	3,16
			$0.600 \times (1.430 - 0.200) =$	0,55
			$0.300 \times \sqrt{2} \times (3.500 - 0.300) =$	1,01



FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
		SUB TOTAL		3726
		FORMAS (POSTERIOR)	$(5200 + 3630) \times 4110$	3866
			$0.510 \times 8 \times 0.400 \times 21$	372
			$0.150 \times 2 \times 3.141 \times 0.125 \times 0.400$	0.31
			$0.300 \times 0.300 \times 1/2$	0.25
		SUB TOTAL		4230
		CONCRETO	$0.200 \times 2.400 \times 3.630$	174
			$0.400 \times 2.800 \times 5.800$	647
			$1.600 \times 1.500 \times 0.400$	192
			$0.150 \times 0.150 \times 1/2 \times 0.400 \times 4$	0.11
	SUB TOTAL		732	
	FORMAS (FRONTAL)	$2000 \times 9430 - 0.700$	1861	

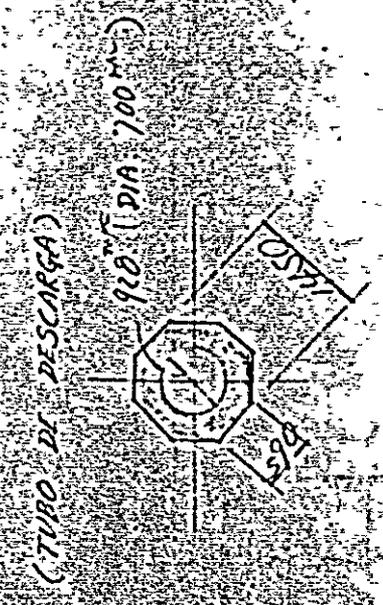
PARTE DE

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
			$0,300 \times 1,300 \times 1,1 (0,300 + 0,300) =$	0,126
		SUB TOTAL		0,126
		FORMAS (FRONTAL)	$0,500 \times (1,430 - 0,300) =$	0,376
			$0,600 \times (1,430 - 0,200) =$	0,554
			$0,350 \times 1,2 \times (1,350 - 0,350) =$	0,31
			$0,900 \times 0,4 \times 0,4 =$	0,144
			$0,150 \times 1,2 \times 0,4 \times 0,4 =$	0,036
		SUB TOTAL		0,606
		POSTERIOR	$0,630 \times 1,4 \times 0,2 + 0,520 \times 1,0 \times 0,50 \times 2 =$	1,476
			$0,400 \times 1,3 \times 0,50 + 0,900 \times 1,200 =$	1,172
			$0,600 \times 2,200 \times 2 + 0,300 \times 1,700 =$	4,50
			$1,900 \times 0,100 \times 2 + 1,900 \times 0,100 =$	0,38

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
<p>PRATO PARA TRABALHO</p>		SUB TOTAL		444,122
		CONCRETO	$0,100 \times 2,000 \times 0,200$	0
			$\frac{2,141}{9} \times 0,100 \times 0,200$	0
<p>BASE DE PORTÃO DE FERRO</p>		SUB TOTAL		0,235
		FORMAS		
		POSTERIORES	$2,000 \times 0,100 - 0,200 \times 0,200$	1,80
			$2 \times 3,141 \times 0,150 \times 0,100$	0,96
				1,86
	BASE DE PORTÃO	CONCRETO	$0,350 \times 0,600 \times 2,000$	0,42
			$0,300 \times 0,300 \times \frac{1}{2} \times 12,000 - 0,300$	0,17
				0,17
	FORMAS (FRONTAL)		$0,200 \times 2,000 + 0,300 \times \sqrt{2} \times (2,000 - 0,300)$	1,12
		SUB TOTAL		1,12

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
<p>(PORTÃO)</p> <p>FORMAS (ALZANTAL)</p> <p>1600</p> <p>200</p> <p>3600</p>	PORTÃO	CONCRETO	$0,2100 \times 0,100 \times 3,600 \times 2$	0,288
			$- 0,250 \times 0,100 \times 3,600 \times 2$	0,360
			$0,150 \times 0,100 \times 1,600$	0,240
		SUB TOTAL		0,288
		FORMAS (ALZANTAL)	$0,100 - 0,0250 \times 2,250 - 0,100$	
			$0,250 - 0,200 \times 1,3,100 \times 2$	7,20
			$- 0,150 \times 0,100 \times 2$	- 0,03
			$0,100 \times 7,000$	0,70
		SUB TOTAL		7,87

FIGURO



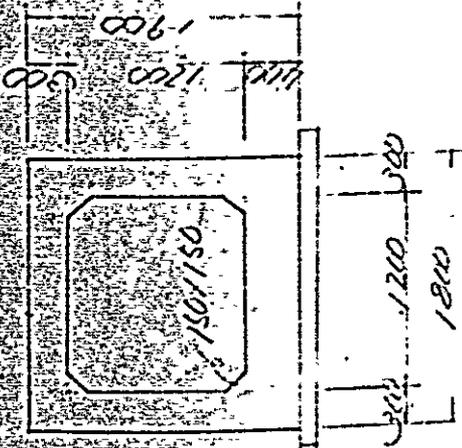
(TUBO DE DESCARGA USUAL)

NOME	DIVISÃO	CALCULO	QUANT.
CONCRETO 1.º SEGUNDO	CONCRETO	$4,228 \times 2 \times 0,590 \times 0,400 / 2$	1,356
		$\frac{3,711}{4} \times (0,250^2 - 0,590^2) \times 10,400$	0,013
	SUB. TOTAL		1,356
FORMAS (FRONTAL)	FORMAS (FRONTAL)	$4,228 \times (0,590 + 0,590) \times \frac{0,400}{2}$	
		$0,928 \times \left(1,2 + \frac{0,400}{2} \right) \times (0,300 + 0,150)$	2,66
	SUB. TOTAL		2,66
FORMAS (POSTERIOR)	FORMAS (POSTERIOR)	0 MESMO	2,66
CAIXA DE ELEVACÃO	ELEVACÃO	TOTAL	
		$6,648 + 8,315 + 5,372 + 13,720$	
		$+ 13,119 + 0,232 + 0,677 + 6,708$	
		1,282	1,282
CONCRETO SIMPLES	CONCRETO SIMPLES	1,356	1,356
CONCRETO SEGUNDO	CONCRETO SEGUNDO	$19,92 + 38,86 + 20,80 + 40,6$	
		$+ 1,12 + 7,37$	
		$7,62 + 31,04 + 42,80 + 36,82$	
		$+ 44,42 + 1,66$	
FORMAS PARA	FORMAS PARA	1,32	1,32
CON. SIMPLES	CON. SIMPLES		2,66
FORMAS PARA	FORMAS PARA		2,66
CON. SEGUNDO	CON. SEGUNDO	(PO) 2,66	2,66

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
	TUBO DE DESCARGA			
	1 TUBO	CONCRETO	$1,200 \times 1,200 - 1,100 \times 1,100 =$	
		FERRAS	$0,150 \times 0,150 \times (1,2 \times 4) \times 35,300 =$	77,463
		SUB TOTAL		77,463
		CONCRETO		
		SIMPRES	$(1,200 \times 0,60) \times 0,10 \times 133,000 =$	9,600
		SUB TOTAL		9,600
		FERRAS		
		(FRONTAL)	$(3,900 \times 3 - 0,150 \times 4) \times 35,300 =$	125,40
		SUB TOTAL		125,40
		FERRAS		
		POSTERIOR	$0,900 \times 0,300 \times 2 =$	1,25,40
		SUB TOTAL		1,25,40

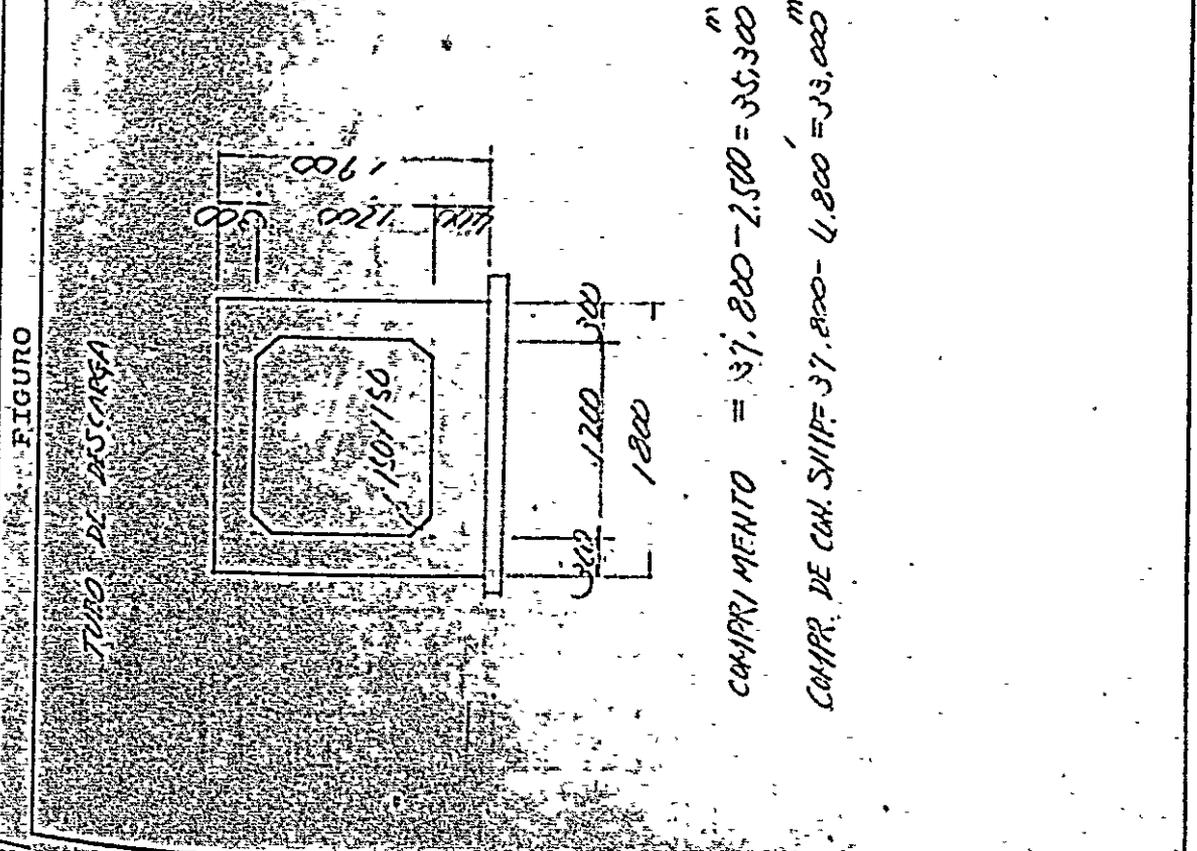
FIGURO

TUBO DE DESCARGA



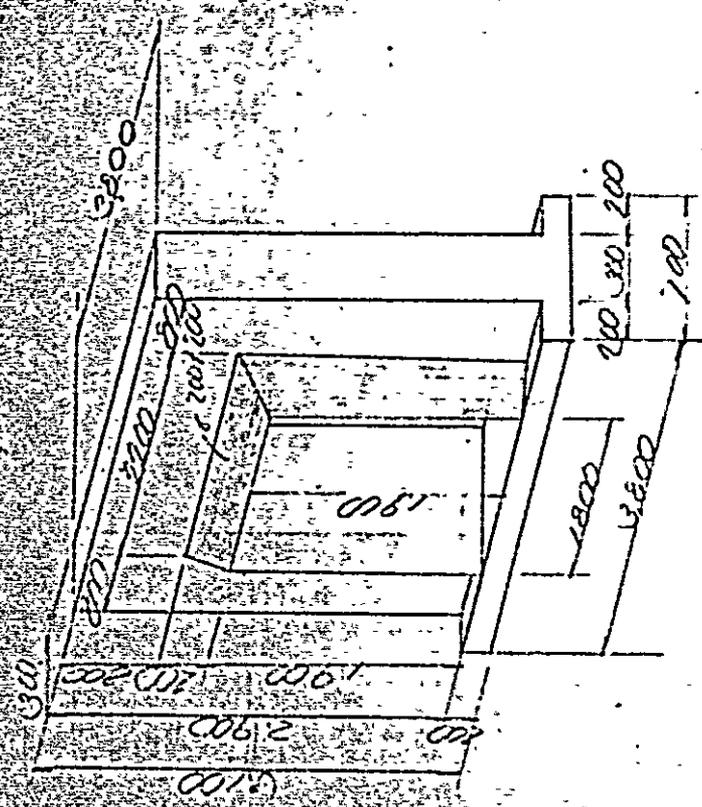
COMPRIMENTO = $37,800 - 2,500 = 35,300^m$
 COMPR. DE CON. SIMP = $37,800 - 4,200 = 33,600^m$

NOME	DIVISÃO	CALCULO	QUAN.
700 DE DESCARGA			
1. TUBO	CONCRETO	$6,910 \times 1,200 = 8,292 \times 2$	
		$0,150 \times 0,150 \times \frac{1}{2} \times 4 \times 35,300$	71,423
	SUB TOTAL		71,423
	CONCRETO		
	SIMPLES	$11,200 \times 200 \times 0,150 \times 33,000 =$	8,800
	SUB TOTAL		8,800
	FORMAS		
	(FRONTAL)	$(8,800 \times 2) - (0,150 \times 4) \times 35,300$	125,40
	SUB TOTAL		125,40
	FORMAS		
	POSTERIOR	$1,900 \times 33,000 \times 2$	125,40
	SUB TOTAL		125,40



FIGURO

(WATER STOP)

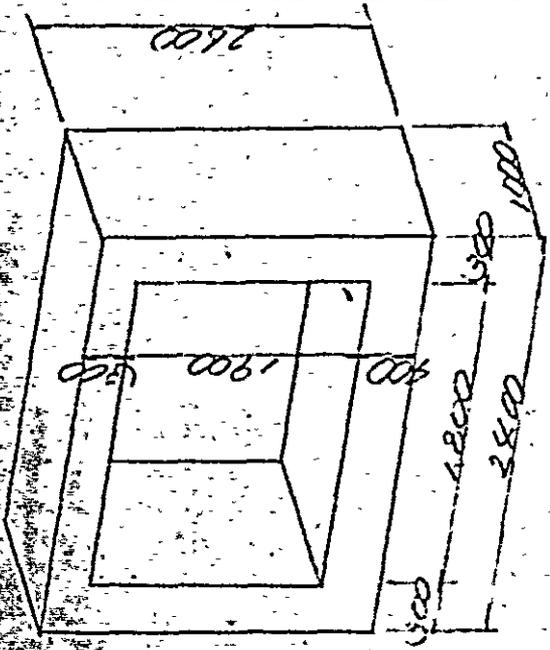


NO. DE	DIVISÃO	CALCULO	QUAN.
	FORMAS PARA		
	CONCRETO	$100 \times (3.200 - 4.900) \times 2 =$	5,36
	SUB TOTAL		5,36
2	WATER STOP CONCRETO	$0.200 \times 0.700 \times 3.200 =$	0,537
		$0.300 \times 2.900 \times 0.200 =$	0,396
		$- 1.800 \times 1.900 \times 0.0500 =$	- 1,926
		$0.200 \times 0.200 \times \frac{1}{2} \times (1.900 + 1.800) \times 4 =$	0,160
		$0.200 \times 0.200 \times \frac{1}{2} \times (1.800 + 1.900) \times 2 =$	0,055
	SUB TOTAL		5,052
	FORMAS		
	POSTERIORES	$(3.200 \times 2 + 0.700 \times 2) \times 0.200 =$	1,70
		$0.200 \times 3.800 \times 2 + 2.000 \times 0.200 \times$	
		$4 + 0.300 \times 2.900 \times 2 =$	14,00
		$0.200 \times \frac{1}{2} \times (1.900 + 0.100) \times 4 =$	2,24
		$0.200 \times \frac{1}{2} \times (1.800 + 0.100) \times 2 =$	1,12

NOME	DIVISÃO	CALCULO	QUAN.
	SUB TOTAL		1971
3 JUNTA	CONCRETO	$(2.600 \times 2.400 - 1.900 \times 1.200) \times 1,100$	2.926
	SUB TOTAL		2.926
	FORMAS (POSTERIAS)	$1.900 \times 2.600 \times 2$	5.300
		$(0.300 + 0.400) \times 2.400 \times 2$	3.360
		$0.300 \times 1.900 \times 4$	2.280
	SUB TOTAL		10.866

FIGURO

(JUNTA)



FIGURO

FIGURO	NOME	DIVISÃO	CALCULO	QUANT.
		FORMAS (FRONTAL)	$2.900 \times 5 \times 2.500$	675
			$0.150 \times 1/2 \times 2.500 \times 4$	211
			$1.000 \times 1.200 + 0.500 \times 1.200$	150
			$0.500 \times 0.50 \times 1/2 \times 4$	0,05
		SUB-TOTAL		1072
		FORMAS (PASTERIZAS)	$3.200 \times (5.200 - 1.200) + 5.200 \times 500$	1762
			$0.300 \times 2.200 \times 2 + 2.500 \times 0.400 \times 2$	332
			$0.600 \times 0.400 \times 2$	0,40
			$0.150 \times 0.150 \times 1/2 \times 12 + 0.200 \times 0.200 \times 1/2 \times 2$	
			$\times 1/2 \times 2$	0,06
			$1.600 \times 0.400 \times 2$	1,0
			$1.500 \times 2.200 \times 2$	540
			$0.150 \times 0.150 \times 1/2 \times 2$	0,07
			$0.150 \times 1/2 \times 1.500$	0,32

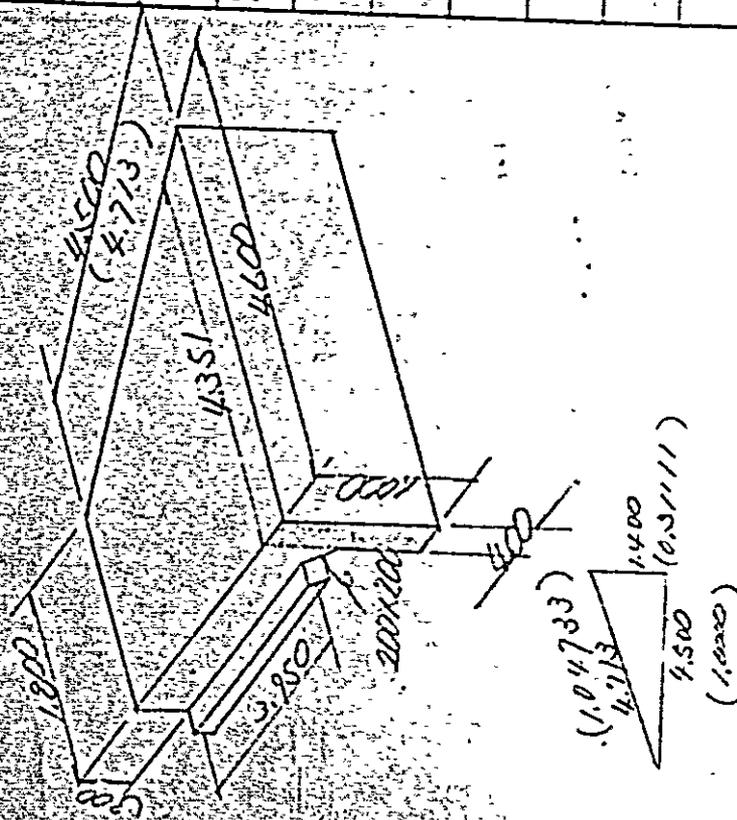
...

FIGURO

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
			$10.700 - 0.150 \times 1.800$	89
			$0.150 \times 1.800 \times 2$	0,50
			$(2.200 - 0.150) \times 2.000 \times 2$	89
		SUB TOTAL		4012
		OUTRO		
		FORMAS	$0.200 \times 13 \times 5.800$	1
		SUB TOTAL		1
		FORMAS PA COM-SIMPLES		
			$(2.050 - 2.000) \times 0.100 \times 2$	2
		SUB TOTAL		0,1

FIGURO

(APRON)

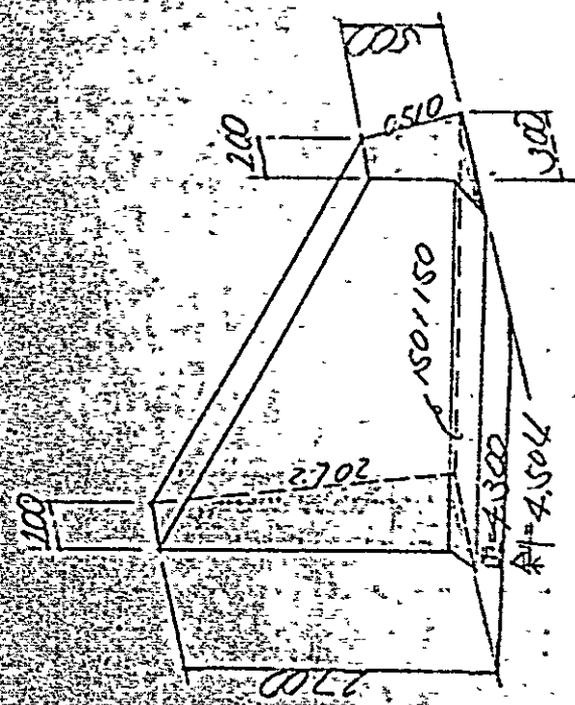


NOME	DIVISÃO	CALCULO	QUAN.
Z. APRON	CONCRETO	$(1200 - 4.600) \times 1/119500 \times$	
		0.000	$2,520$
		$(4.351 + 4.600) \times 1/2 \times 0.400 \times 10700$	$1,253$
		$0.200 \times 0.200 \times 1/2 \times 4.289$	$0,036$
	SUB TOTAL		$(4,809)$
	CON. SIMPLIES	$(1200 - 0.200) \times (4.250 + 0.200) \times 1/2 \times$	
		0.950×0.100	$1,761$
	SUB TOTAL		$1,761$
	FORMS (FRONTAL)	0.300×4.600	$1,38$
	SUB TOTAL		$1,38$
		$(4.000 \times 104733) \times 6.300 \times 1/2$	$1,58$
		$0.100 \times 0.200 \times 1/2 \times 2$	$0,04$
		0.700×4.600	$1,22$

FIGURA	NOME	DIVISÃO	CALCULO	QUAN.
			0.200×4.229	2.115
		SUB-TOTAL		5.02
		FORMAS PR. CONV. SIMPLES	$(3.950 \times 10.4733) \times 0.10012$	0.083
			$0.200 \times \sqrt{2} \times 0.100 \times 2T$	0.083
		SUB-TOTAL		0.166
		OUTRO		
		FORMAS	$0.200 \times \sqrt{2} \times 4.229$	1.21
		SUB-TOTAL		1.21
	3. PAREDE			
		CONCRETO	$(0.200 + 0.300) \times \frac{1}{2} \times 2.700 + (0.200 + 0.300) \times \frac{1}{2} \times 6.500 \times \frac{1}{2} \times 4.300$	1.750
			$0.150 \times 0.150 \times \frac{1}{2} \times 4.300$	0.085
		SUB-TOTAL	$1.768 \times 2T$	0.536

FIGURO

(PAREDE)



FIGURO	NOME	DIVISÃO	CALCULO	QUAN.	
	FORMAS (FRONTAL)		$(2.700 - 0.150) \times 6.500 \times \frac{1}{2}$	6.553	
			4.502	0.96	
			$0.150 \times 12 \times 4.504$	0.01	
			$0.150 \times 0.150 \times 12$	0.01	
		SUB TOTAL	7.504.2	15.00	
		FORMAS (POSTERIOR)		$(2.700 + 0.610) \times 12 \times 4.504 \times \frac{1}{2}$	15.47
		SUB TOTAL		15.47	
	4. PAREDE CONCRETO			$(1.500 + 1.562) \times \frac{1}{2} \times 0.200 \times 0.500$	0.153
				$(1.200 + 1.324) \times \frac{1}{2} \times 0.400 \times 1.000$	0.555
				$0.150 \times 0.150 \times 12 \times 0.209$	0.007
		SUB TOTAL	0.660.2	1.322	
	FORMAS (FRONTAL)			$(0.500 - 0.150) \times 0.209$	0.007

FIGURO

FIGURO	NOME	DIVISÃO	CÁLCULO	QUAN.
			$0,150 \times 1,2 \times 0,209 + 0,150 \times 0,151 \times 1/2 =$	0,005
			$1,500 \times 0,500 + 0,300 \times 1,200 =$	1,1
		SUB TOTAL		1,105
		(POSTERIOR)	$(1,000 - 0,300) \times 1,200 = 1,000 \times 1,400 =$	1,400
			$1,324 \times 1,000 + 0,200 \times 0,500 =$	1,42
			$(1,562 - 0,200) + (1,562 - 0,300) \times 1/2 \times 1,000 =$	0,61
		SUB TOTAL	3,3212	6,661
	PARE DE SAÍDA	CONCRETO CON.	$1,026 + 0,659 + 3,536 + 1,320 =$	11,541
		SIMPLES FORMAS	0,100 + 1,711	1,811
		(FRONTAL) FORMAS	$0,28 + 1,38 + 1,500 + 1,200 =$	4,36
		(POSTERIOR) FORMAS PARA CON. SIMPLES	$0,27 + 8,02 + 1,447 + 6,64 =$	16,37
		OUTRO FORMAS	0,10 + 0,86	0,96
			1,21	1,21

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
	WATER STOP			
	6-150	ENTRADA	1.10 x 2.10 x 2	11.00
		CAIXA DE	CASA DE BOMBA	
			505 x 2 + 450 x 2	79.00
		TUBO DE	DESCARGA USAL	
			1.95 x 2 + 1.90 x 2 =	7.70
		CAIXA DE	ELEVAÇÃO	
			1.95 x 2 + 1.90 x 2 =	7.70
		TUBO DE	DESCARGA	
			1.55 x 2 + 1.50 x 2 =	6.10
		TUBO DE	DESCARGA	
			1.55 x 2 + 1.50 x 2 =	6.10
		SAIDA	2.75 x 2 + 1.50	7.00
		TOTAL		64.90

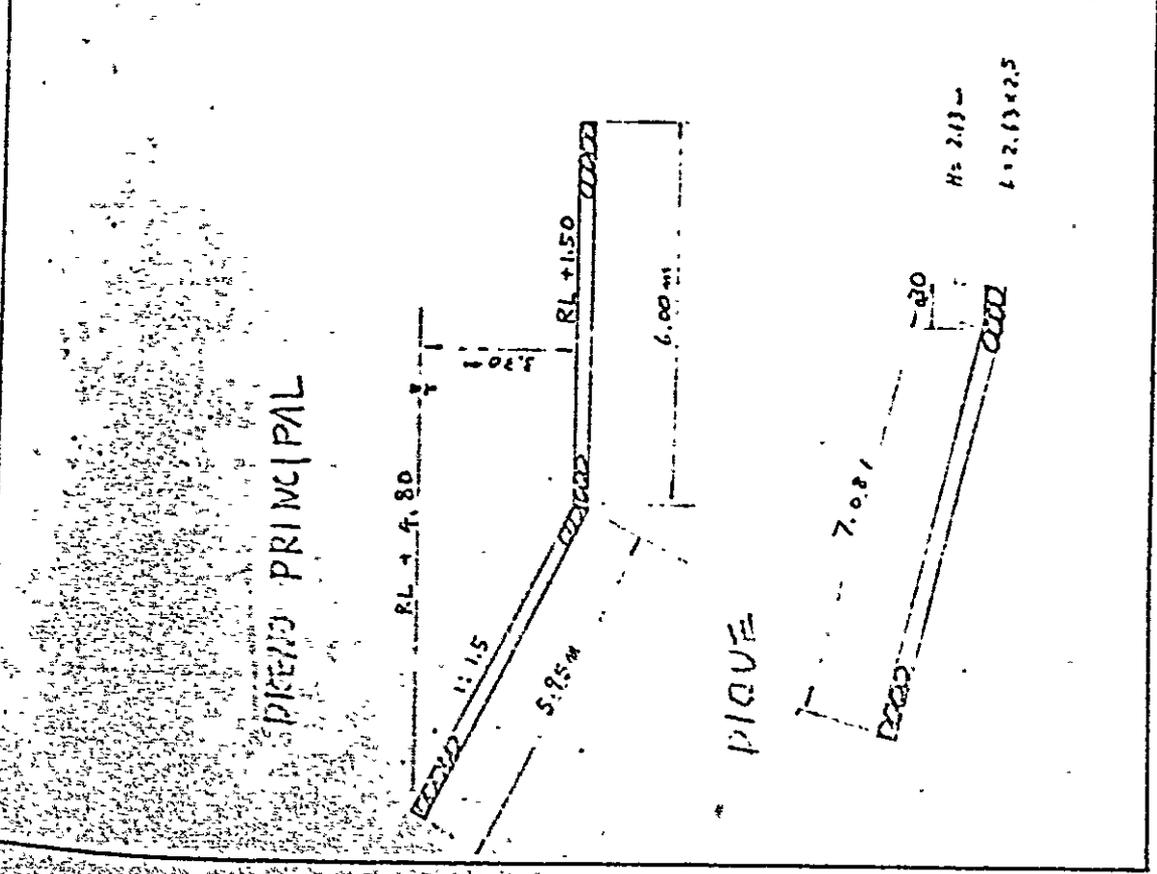
FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
	SHEET PILE DE FERRO			
	TIPO E 1=5 m	ENTRADA		120
		TURO DE DESLARGA		90
		SAIDA		140
		TARE DE DO SAIDA		170
		TOTAL		52 U.M.
	AREIA		0.322 x 6.300 x (30.708 - 2.000) =	2.712
		TOTAL		2.712

FIGURO

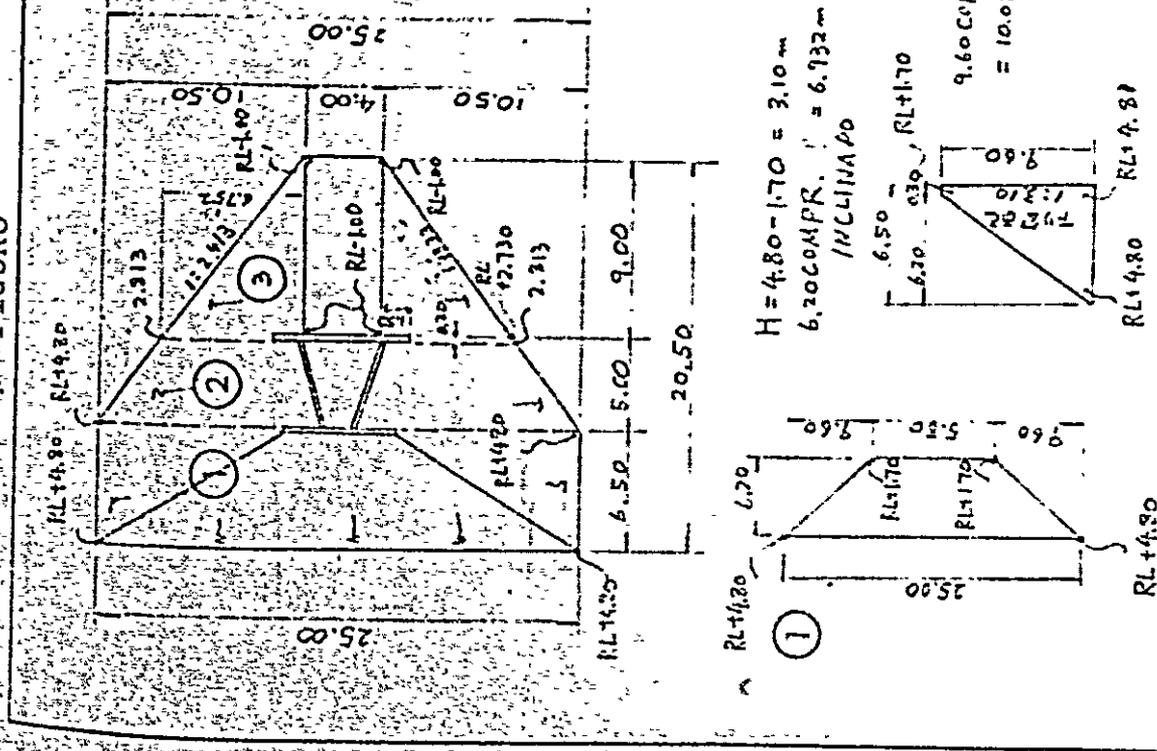
FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
	WFF HOLE			
	Ø 50 L = 40			13 UN.
	BIOMBA		1.60 x 3.60	2 UN.
	ESCALADA	ENTRADA	15 x 2 UN	30
		CAIXA DE REFE. S.A.F.	15 x 2 UN	30
		CAIXA DE ELEVASSÃO	30	30
		TOTAL		90 UN.
	TAMPO	ENTRADA	Ø 70 x 0.700	2
	Ø = 3.2	CAIXA DE REFRESCAS	"	2
		TOTAL		4 UN.

FIGURO

NOME	DIVISÃO	CALCULO	QUAN.
TAMPO	CAIXA DE ELEVACAO	1,200 X 2,100	3 UN
ESCALADA	CAIXA DE ELEVACAO		1 UN
PROTEÇÃO DE PEDRA	PRENHO PRINCIPAL	$(5.95 + 6.00) \times 25.00$	298 m ² 75
	PIQUE	$(7.081 + 0.30) \times 25.00$	184 m ² 53



FIGURO



NOME	DIVISÃO	CALCULO	QUANT.
	SAÍDA		
	ÁREA ①	$1) (25.00 + 5.30) \times \frac{1}{2} \times 6.932$ $= 106.75 \text{ m}^2$	
		$2) (6.20 \times 10.088 \times \frac{1}{2} + 0.30 \times 10.088) \times 2 = 198.82 \text{ m}^2$	
	SUB TOTAL	$106.75 + 198.82 = 305.57$	
	ÁREA ②	$6.752 \text{ COMPR. INCLINADO} (1:3.13)$ $= 7.714$	
		$1) 9.00 \times 7.714 \times \frac{1}{2} \times 2$ $= 69.43 \text{ m}^2$	
		$2) 4.00 \times 9.00 = 36.00$	
		$3) L = 9.10 \div 1.333 - 1.50 = 5.327$ $M = 5.327 \div 2.413 = 2.208$	
		$\text{COM PR. INCLINADO} = 5.766$	

NO.	DIST.	DIST. MEDIA	ESCAVAÇÃO		ENCHIMENTO		SEÇÃO		SEÇÃO		SEÇÃO		SEÇÃO	
			COMPRI.	QUANT. AREA	COMPRI.	QUANT. AREA	COMPRI.	QUANT. AREA	COMPRI.	QUANT. AREA	COMPRI.	QUANT. AREA	COMPRI.	QUANT. AREA
+ 77.10	2.60	1.40	63.05	29.57	57.97	21.11								
SUB TOTAL				176.52		119.70								
+ 77.10		1.05	63.65	21.20	57.97	20.87								
+ 74.20	2.10	1.05	59.28	67.94	54.20	51.71								
SUB TOTAL				128.44		117.72								
+ 24.20		15.85	21.66	363.31	16.58	212.79								
+ 55.90	31.70	15.85	21.66	363.31	16.58	212.79								
SUB TOTAL				181.62		575.58								
+ 55.90		2.00	49.28	78.56	44.20	28.20								
+ 59.90	9.60	2.00	49.28	78.56	18.35	31.70								
SUB TOTAL				197.12		125.10								
+ 59.90		2.50	52.80	132.11	21.20	53.00								
+ 64.90	5.00	0.75	52.80	39.10	5.03	3.77								
+ 66.90	1.50	0.75	52.80	39.10	0.0	0.00								
SUB TOTAL				211.70		56.77								
TOTAL				246.67		596.25								

156

2012 ESTRADA BR 228503

NO.	DIST.	DISTR. MEDIA	ESCALAÇÃO		ATERRO		LASTRO DE PEDERA		ASFALTO		QUANT.	
			SECAO COMPR.	QUANT. AREA	SECAO COMPR.	QUANT. AREA	SECAO COMPR.	QUANT. AREA	SECAO COMPR.	QUANT. AREA	SECAO COMPR.	QUANT. AREA
Nº 0	50,00	35,00	3,10	15,50	-	-	-	-	-	-	-	-
Nº 1	50,00	50,00	1,98	99,00	70,10	3505,00	-	-	-	-	-	-
Nº 2	51,00	50,00	1,40	70,00	20,40	1020,00	-	-	-	-	-	-
Nº 3	51,00	50,00	34,60	1730,00	-	-	-	-	-	-	-	-
Nº 4	50,00	50,00	45,76	2288,00	-	-	-	-	-	-	-	-
Nº 5	50,00	50,00	5,70	285,00	-	-	-	-	-	-	-	-
Nº 6	57,00	50,00	7,55	377,50	0,20	10,00	-	-	-	-	-	-
Nº 7	50,00	50,00	1,50	75,00	28,40	1420,00	-	-	-	-	-	-
Nº 8	50,00	50,00	1,50	75,00	16,58	829,00	-	-	-	-	-	-
Nº 9 (E.P.)	50,00	38,50	9,16	457,66	0,10	3,85	-	-	-	-	-	-
+27,00	27,00	13,50	28,97	1448,10	-	-	-	-	-	-	-	-
SUB TOTAL	477,00	477,00		5788,26		6787,85	1,60	763,20	0,24	114,48		

ESTRADA 265

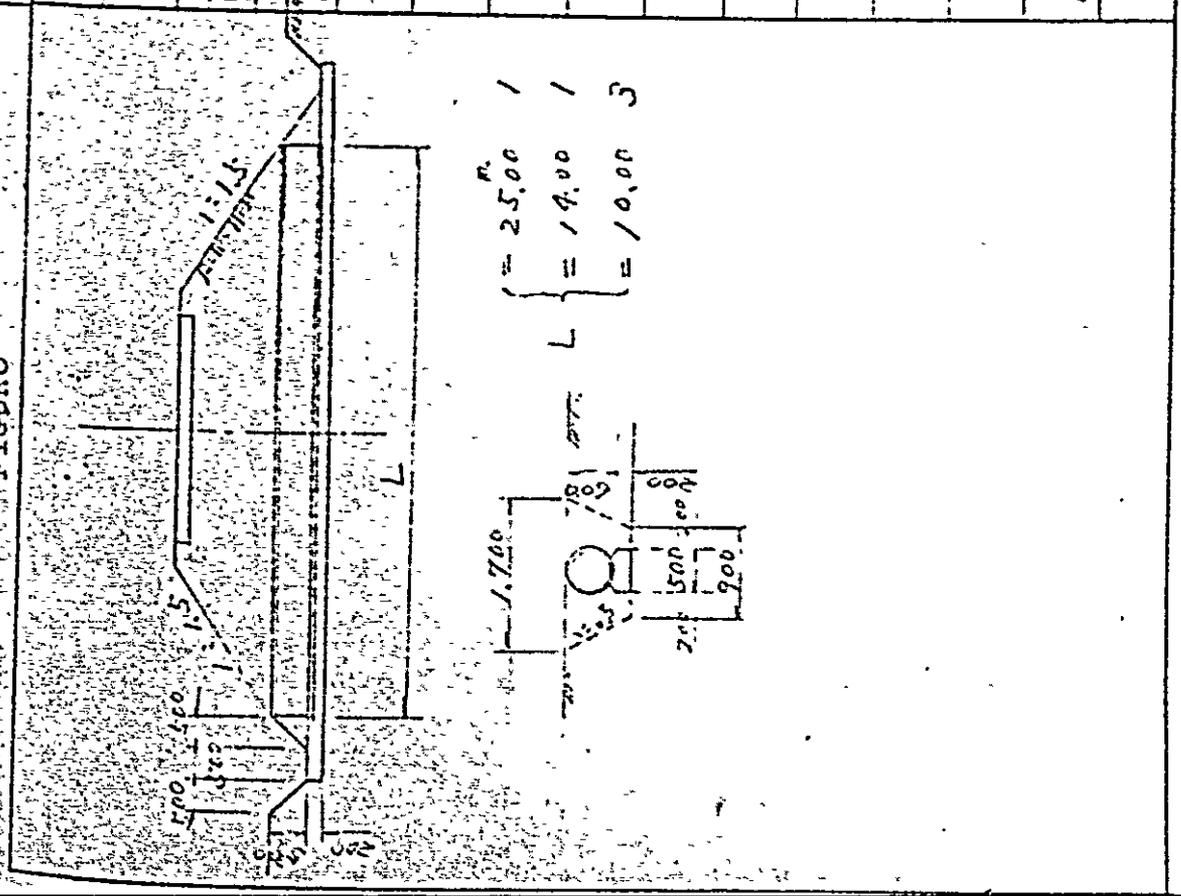
NO.	DIST.	DIST. MEDIA	ESCALAÇÃO		ATELUO		LASTRO DE PEDRA		ALCALTO		O FACE S.O	
			SEÇÃO COMPRI	QUANT. AREA	SEÇÃO COMPRI	QUANT. AREA	SEÇÃO COMPRI	QUANT. AREA	SEÇÃO COMPRI	QUANT. AREA	SEÇÃO COMPRI	QUANT. AREA
No 0	0,0	25,00	22,20	562,50								
No 1	50,00	51,00	15,70	195,00								
No 2	50,00	50,00	30,00	1.000,00								
No 3	50,00	50,00	0,50	25,00	11,10	555,00						
No 4	50,00	40,50	1,10	44,55	0,50	20,25						
(L.P.)	31,00	15,50	0,50	7,95	1,30	21,15						
TOTAL	231,00	231,00		2.124,00		595,40	1,20	277,20	0,18	41,55		
TOTAL				25.786,06		2.383,25		1448,00		217,26		15.002,51

27 BASE DE CASAS

NO.	DIST.	DIST. MEDIA	ESCALAÇÃO		ATE PRO		EXCESSO		SEÇÃO		QUANT.	
			SEÇÃO	QUANT. AREA	SEÇÃO	QUANT. AREA	SEÇÃO	QUANT. AREA	SEÇÃO	COMPRI.	SEÇÃO	COMPRI.
No 5		2,50	0									
+ 28,00												
+ 33,00	5,00	11,00	77,95	857,45								
No 6	17,00	21,00	67,63	1420,23								
+ 25,00	25,00	20,00	65,86	1317,20	0,44	8,80						
+ 40,00	15,00	12,50	60,54	756,75	1,62	20,25						
No 7	10,00	14,00	48,10	673,40	4,50	63,00						
+ 18,00	18,00	21,50	39,50	849,25	8,36	136,74						
+ 23,00	25,00	17,50	88,82	1554,35								
No 8	14,00	16,00	27,38	438,08	1,40	230,40						
+ 3,00												
+ 25,00	22,00	23,50	88,43	2078,11								
No 9	5,00	20,00	124,71	2494,20								
+ 15,00	15,00	10,00	280,54	2805,90								
+ 20,00	5,00	6,00										
+ 27,00	7,00	6,00										
+ 32,00	5,00	11,50	174,50	2006,75	1,60	248,40						
No 10	18,00	15,00	218,02	3270,30	3,06	45,90						
+ 12,00	12,00	8,50	173,06	1911,01	8,55	72,68						
+ 17,00	5,00	2,50										
SUB-TOTAL				219248		826,17	51166,31					

N/2

FIGURO



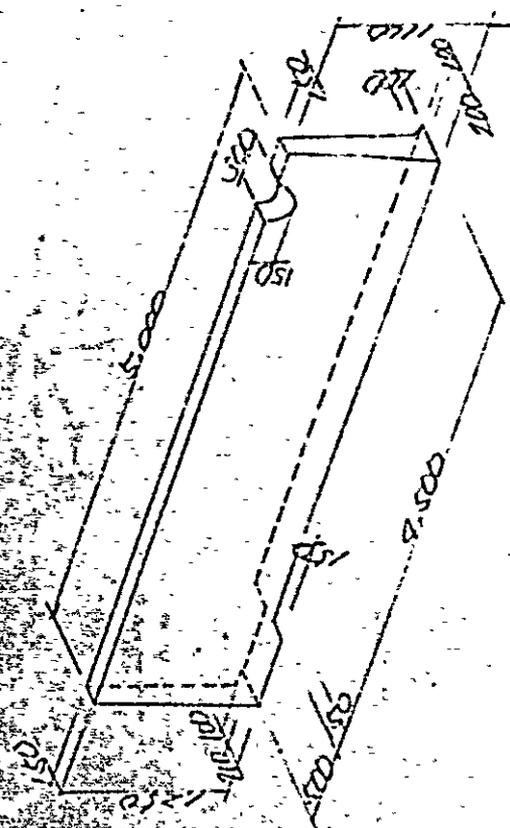
QUAN.	CALCULO	DIVISÃO	NONE
3116	$0.5 \times 0.2 + 0.22 \times 0.7 \times 2 = 1.154$	concreto	L = 25.00
1080	$0.1154 \times 27.0 =$	Formas	
930	$0.2 \times 2 \times 27.0 =$	Formas	
265	$3116 \times 30 =$	Ferragem	
163	$(0.9 + 1.7) \frac{1}{2} \times 0.6 \times 25.5 =$	Escavacao	
250	$\{ 1.04 - (0.3^2 \pi + 0.115) \} \times 25.5 =$	Enchimento	
184	$\phi 500 \times 25.0$	Fornimento de tubo	
840	$0.1154 \times 16.0 =$	concreto	L = 14.00
550	$0.2 \times 2 \times 16.0 =$	Formas	
151	$1.846 \times 30.0 =$	Ferragem	
73	$1.04 \times 14.5 =$	Escavacao	
140	$\{ 1.04 - (0.3^2 \pi + 0.115) \} \times 14.5 =$	Enchimento	
385	$\phi 500 \times 14.0 =$	Fornimento de tubo	
480	$0.1154 \times 12.00 =$	concreto	L = 10.00
	$0.2 \times 2 \times 12.00 =$	Formas	

FIGURO	NOBRE	DIVISAO	CALCULO	QUAN.
	FARM	CONCRETO	$2.550 \times 2.400 \times 0.200$	2,42
	POUND		$0.700 \times 2.900 \times 0.200$	0,336
			$0.200 \times 2.900 \times 0.150$	0,147
		SUB TOTAL		2,892
		CON	$4.650 \times 2.600 \times 0.100$	1,209
		SIMPLIS	$0.800 \times 2.600 \times 0.100$	0,208
			$0.100 \times 0.150 \times 2.600$	0,004
		CON:		1,417
		SIMPLIS	$0.200 \times 2.400 \times 2$	0,71
		FORMAS	$0.200 \times (4.550 + 0.700) \times 2$	2,10
		$0.200 \times 0.150 \times 2$	0,06	
	SUB TOTAL		3,12	
	FORMAS PARA	CON: SIMPLIS	$0.100 \times 2.600 \times 2$	0,52
		$0.100 \times (4.650 + 0.800) \times 2$	1,09	
		$0.100 \times 0.150 \times 2$	0,03	
	SUB TOTAL		1,64	

FIGURO	NOBRE	DIVISÃO	CALCULO	QUAN.	
	PAREDE	CONCRETO	$(0,150 + 0,200) \times \frac{1}{2} \times 1,100 \times 2,000$	1	
			$0,110 \times 0,100 \times \frac{1}{2} \times 2,000$	0,01	
			$- 0,15^2 \times 3,14 \times \frac{1}{2} \times 0,150$	0,005	
		SUB TOTAL		0,376	
		FORMAS	$1,000 \times 2,000$	2,00	
			$\sqrt{1,100^2 + 0,050^2} \times 2,00$	2,20	
			$\sqrt{0,100^2 + 0,100^2} \times 2,000$	0,10	
		SUB TOTAL		4,44	
		PAREDE	CONCRETO	$(0,150 + 0,200) \times \frac{1}{2} \times 1,100 \times 2,500$	0,37
				$\frac{1}{2} \times (0,15 + 0,200) \times \frac{1}{2} \times 1,100 + (0,150 + 0,200) \times \frac{1}{2} \times 1,250 \times 0,150$	0,01
			$(0,110 + 0,200) \times \frac{1}{2} \times 1,250 \times 0,150$	0,01	
		SUB TOTAL		0,39	
		FORMAS	$1,000 \times 2,500 + 4,500 + (1,00 + 1,100) \times \frac{1}{2} \times 0,150$	4,11	

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
			150×0.50	0.50
			$\sqrt{100^2 + 0.50^2} \times 9.50$	4.96
			$(\sqrt{100^2 + 0.15^2} + \sqrt{125^2 + 0.15^2}) \times \frac{1}{2} \times 0.15$	0.18
			$\sqrt{125^2 + 0.15^2} \times 0.50$	0.63
			$\sqrt{0.100^2 + 0.100^2} \times 5.00$	0.71
	PARE DE-3	SUB TOTAL	$(0.150 + 0.200) \times \frac{1}{2} \times 1.50 \times 2.000$	0.432
		CONCRETO	$0.100 \times 0.100 \times \frac{1}{2} \times 2.000$	0.010
			$- 0.150^2 \times 3.14 \times 0.200$	- 0.111
		SUB TOTAL	1.150×2.000	2.300
		FORMAS	$\sqrt{125^2 + 0.15^2} \times 2.000$	2.50
	SUB TOTAL	$\sqrt{0.100^2 + 0.100^2} \times 2.000$	0.28	
	SUB TOTAL		5.08	

FIGURO



FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
	PAREDE 4	CONCRETO	$(2,150 + 2,20) \times \frac{1}{2} \times 1,10 \times 9,50$	0,216
			$1,015 \times 1,20 \times \frac{1}{2} \times 1,10 + (0,15 \times 0,20) \times \frac{1}{2} \times 1,10$	0,051
			$(0,150 + 0,200) \times \frac{1}{2} \times 1,250 \times 0,500$	0,109
			$n=7$ $0,100 \times 0,100 \times \frac{1}{2} \times 5,000$	0,025
			$- 0,150 \times 3,140 \times 0,150 \times \frac{1}{2}$	- 0,036
		SUB TOTAL	$1,00014500$	1,221
		FORMAS	$(1,100 + 1,150) \times \frac{1}{2} \times 0,150$	4,11
			$1,150 \times 0,500$	0,58
			$\sqrt{1,100^2 + 0,050^2} \times 9,500$	4,16
			$\sqrt{1,100^2 + 0,050^2} + \sqrt{1,250^2 + 0,050^2} \times \frac{1}{2} \times 1,10$	1,15
			$\sqrt{1,250^2 + 0,050^2} \times 0,500$	1,15
			$\sqrt{0,100^2 + 0,100^2} \times 5,000$	0,111
		SUB TOTAL		11,72

FIGURO	NOME	DIVISAO	CALCULO	QUAN.
<p>BASE DE CASA DE BOMBA</p>	PAREDE	CONCRETO	$(0.150 + 0.200) \times 1.100 \times \frac{1}{2} \times 2$	0.14
		SUB TOTAL	$(0.150 + 0.200) \times 1.250 \times \frac{1}{2} \times 2$	0.39
		FORMAS	$\frac{1}{2} \times 1.100^2 \times 0.05 \times (0.150 + 0.200) \times \frac{1}{2}$	0.66
		SUB TOTAL	$\frac{1}{2} \times 1.100^2 \times 0.05 \times (0.150 + 0.200) \times \frac{1}{2} \times 2$	0.51
	FARM. POND. CONCRETO	TOTAL	$25/22 \times 0.390 = 1.021 \text{ m}^3 \times 1.456 = 1.486$	5.600
	CON. SIMPLES		1.456	1.456
	FORMAS		$3.12 = 4.48 + 11.72 + 5.08 = 17.2 + 0.83 =$	8.95
	FORMAS PARA CON. SIMPLES		1.84	1.84
	BASE DE CASA DE BOMBA	CONCRETO	$4.150 \times 3.150 \times 0.100$	1.287
		TOTAL	$1.200 \times 0.600 \times 0.300$	0.216
	FORMAS	$0.100 \times (4.15 + 3.15) \times 2$	1.52	
		$0.100 \times (0.60 + 1.20) \times 2$	1.31	

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
			$0.330 \times (0.660 \times 1.200) \times 2$	1.72
		TOTAL		2.59
		PEPRA	$0.335 \times 7.35 \times 0.20$	2.71
		TOTAL		2.91
	LAPRÃO	AREIA	$(0.660 \times 0.330 - 0.330 \times 0.785 \times \frac{1}{2}) \times 12.3^m$	2.05
		TUBO DE CONCRETO ARMADO	12.3^m	12.3
		ESCAVAÇÃO	$1.40 \times 0.529 \times 12.3^m$	7.1
		ENCHIMENTO	$9.1 - 3.3$	5.8
		EXCESSO	$(0.660 \times 0.330 + 0.360 \times 0.785 \times \frac{1}{2}) \times 12.3^m$	3.3
		CANAL COLETO	$3.0 + 4.5$	7.5
	BIOMBA	PRATO DE FERRO	$(7 \text{ UN. } (2.3 \times 2.5 \times 1.99^m) + 0.689 \times 1.99 \times 4)$	17
		"	$(11 \text{ UN. } (2.3 \times 2.5 \times 1.199^m) + 0.689 \times 1.99 \times 11)$	47
				12

FIGURO	NOME	DIVISÃO	CALCULO	QUAN.
			$2 \text{ UN} \times 1,924 = 3,848$	23
		VEVE DE FERRO	$4 \times 0,270 = 1,080$	300
		FERRO	$(1 \times 2,00 \times 10 \times 20) = 400$	71
		ANCORA	$(4 \times 10 \times 110) = 4,400$	07
	CAIXA DE VALVULA	CONCRETO	$0,600 \times 0,500 \times 0,700 = 0,210$	0252
			$- 0,300 \times 0,700 \times 0,600 = 0,126$	0447
			$- 0,332 \times 0,159 \times 0,150 = 0,008$	0118
		TOTAL		0702
		FORMAS	$0,600 \times 0,700 \times 7 = 2,940$	150
		TUBO DE CONCRETO ARMADO	$\phi 400, l = 1,000$	UN
		TAMPO	4×900	UN
	BUEIRO	TUBO DE CONCRETO ARMADO	$\phi 300, l = 6^m$	UN

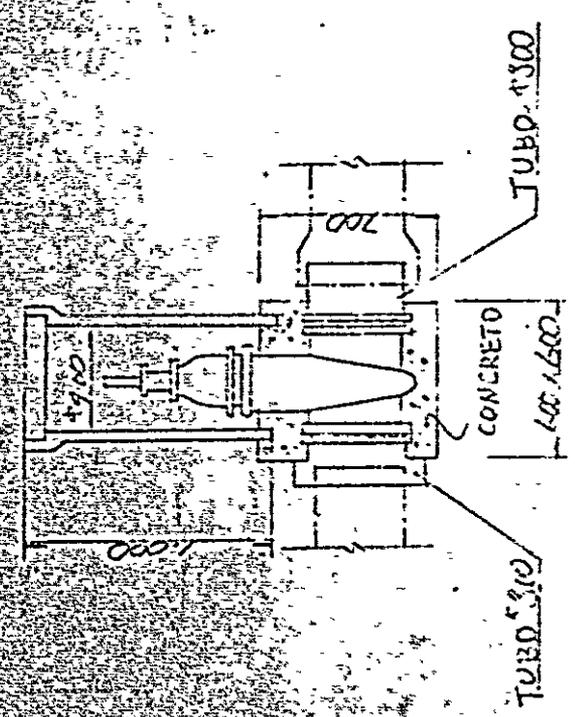


FIGURA	NOME	DIVISÃO	CALCULO	QUAN.	
	OBRAS DE SOLO	ATE PPO	$(114,70 - 26,25) \times 2 \times (5,21 - 1,1)$ $= 9,16 \times 3,76 \times 2 = 68,60$ $= (5,30 \times 2,30 + 6,40 \times 2,70) \times 2 \times 0,77$	81,70 = 2,11 = 9,70	
	TOTAL	TOTAL		68,60	
	CUT OFF	CUT OFF	$0,529 \times 6,160 \times 1,800$ $0,629 \times 1,450 \times 3,600$		9,81 2,54
	TOTAL	TOTAL			12,35
	DEFICIT	DEFICIT			55,74

DIVISÃO	TUBO		TUBO ESPECIAIS			TUBO		VALVULA		OBRAS DE SOLO			ENCAIXE
	COMPRIMENTO	DE	TS	TS BEND	FLEX FIBRE SALA TAMP	TUBO DE PVC	TUBO DE PVC	VALVULA	TAP	ESCAVAÇÃO	AREIA	DESECO	
TUBO REITO													
P	4	M	157										
1	2		373	28					2	13342	1072	1257	367
2	3		660	65					8	22455	1848	2117	845
1	4		485	48					6	16486	14930	1556	684
2	5		500	49					5	16996	15399	1604	637
TOTAL	819	4	2048	190					21	69599	63031	5799	2470
TUBO ESPECIAIS													
A													
B													
2													
3													
4													
C													
5													
TOTAL													

