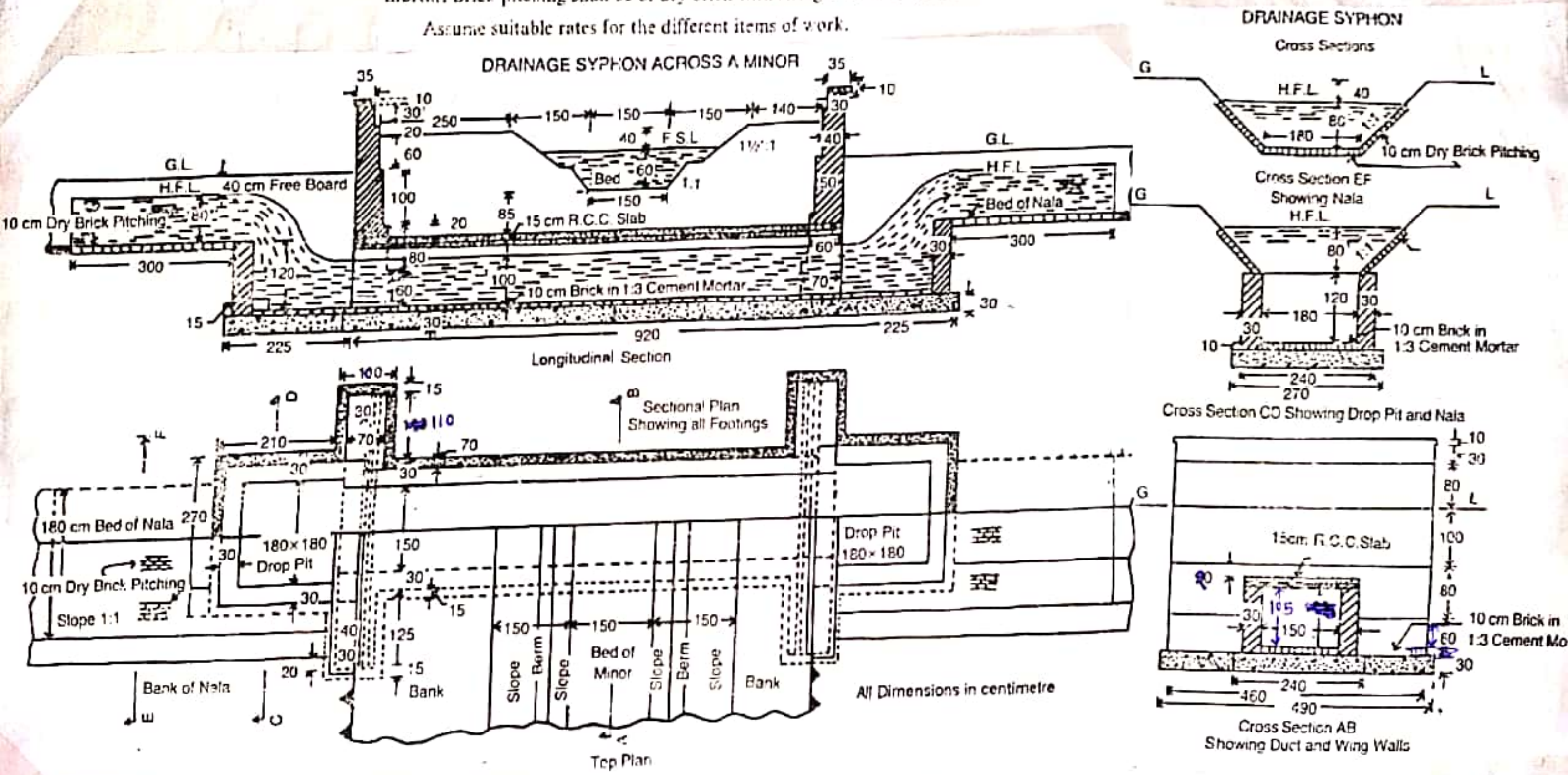


8-0313

Example 7. — Prepare a detailed estimate of a Drainage Syphon across a minor from the given drawing, Figs. 9-8 and 9-9.

Foundation concrete shall be of 1 : 4 : 8 cement concrete with brick ballast. All brickwork shall be of 1 : 4 cement mortar. Exposed surfaces of brickwork shall be struck pointed with 1 : 2 cement mortar. Brick pitching shall be of dry brick with straight over burnt bricks.

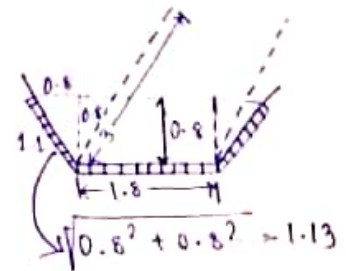
Assume suitable rates for the different items of work.



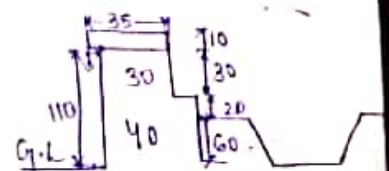
Item No.	Description in foundation	NO.	L	B	H	Q	Ex. note.
1.	Earthenwork excavation in foundation Drop pit wing wall Syphon Duct	2	2.1	2.7	1.6	18.144 m ³	H = 1.2 + 0.1 + 0.3 = 1.6
		4	1.25	1.0	1.6	8 m ³	L = 1.1 + 0.15 = 1.25
		1	9.5	2.4	1.6	36.48 m ³	L = 9.2 + 0.15 + 0.15 = 9.5
		Total =			62.624 m ³		
2.	Concrete work in foundation 1:4:2 Syphon Duct wing wall Drop pit	1	9.5	2.4	0.3	6.84	
		4	1.25	1.0	0.3	1.5	
		2	2.1	2.7	0.3	3.402	
		Total =			11.742 m ³		
3.	1st class Brickwork with 1:4 cement sand mortar. → Syphon Duct wall	2	9.2	0.3	1.15	6.348 m ³	H = 0.1 + 1.05

→ wing wall	Drop pit (side wall)	2x2	2.1	0.3	1.3	3.276	$L = 1.2 + 0.1$
→ front wall		2	2.0 1.8	0.3	1.3	1.404	$L = 2.7 - (2 \times 0.3) - (2 \times 0.15)$ $= 1.8$
→ wing wall	1st footing	4	1.25	0.7	0.7	2.45	$L = 1.25 + 0.15 - 0.15 - 1.25$
	2nd footing upto slab	4	1.25	0.6	0.6	1.8	$L = 0.8 - 0.2$
	Parapet wall 60cm	2	4.6	0.6	0.2	1.104	
	50cm	2	4.6	0.5	1	4.6	
	40cm	2	4.6	0.4	0.8	2.944	
	30cm	2	4.6	0.3	0.3	0.828	
	Coping	2	4.7	0.35	0.1	0.324	
4.	R.C.C. slab in syphon	1	9.2	2.1	Total =	25.083m ³	
5.	10cm thick brick floor (1:3 cement sand mortar) including (1:2) cement				0.15	2.898m ³	$B = 1.5 + 0.3 + 0.3 = 2.1$
	Pointing	1	9.2	1.5		13.8	
	→ Syphon duct					6.48	

4. R.C.C. slab (in gully)	1	9.2	1.5		13.8
5. 100-mm thick brick floor (1:3 cement sand mortar) including (1:2) cement					6.48
Pointing → Syphon duct → Drop pit	1 2	9.2 1.8	1.5 1.8		13.8 6.48
				Total:	20.28 m ²
6. 100-mm Dry brick pitching Bed of Nala	2	3.0	1.8	10.8	10.8
Slopes of nala	4	3.0	1.13	10.8	13.56
7. Cement pointing (1:2) → inner face of Syphon Duct	2	9.2		1.05	19.32
→ Drop pit inner face	2 x 3	1.8		1.2	12.96
→ Drop pit top	2	6	0.3		3.6
→ Parapet wall inner face, top	2	4.6		2.3	21.16
Outer face up to G.L.					
→ outer face of wing wall above slab	2	$\frac{1.8 + (1.8 + 1.2 + 1.2)}{2}$		$\times 1.2 = 3.6 \text{ m}^2$	
					60.64 m ²

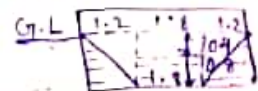


$$L = 2.1 \times 2 + 1.8 = 6$$



$$H = 0.2 + 0.1 + 0.3 + 0.11$$

$$0.3 + 5 + 0.1 + 0.05 = 2.3$$



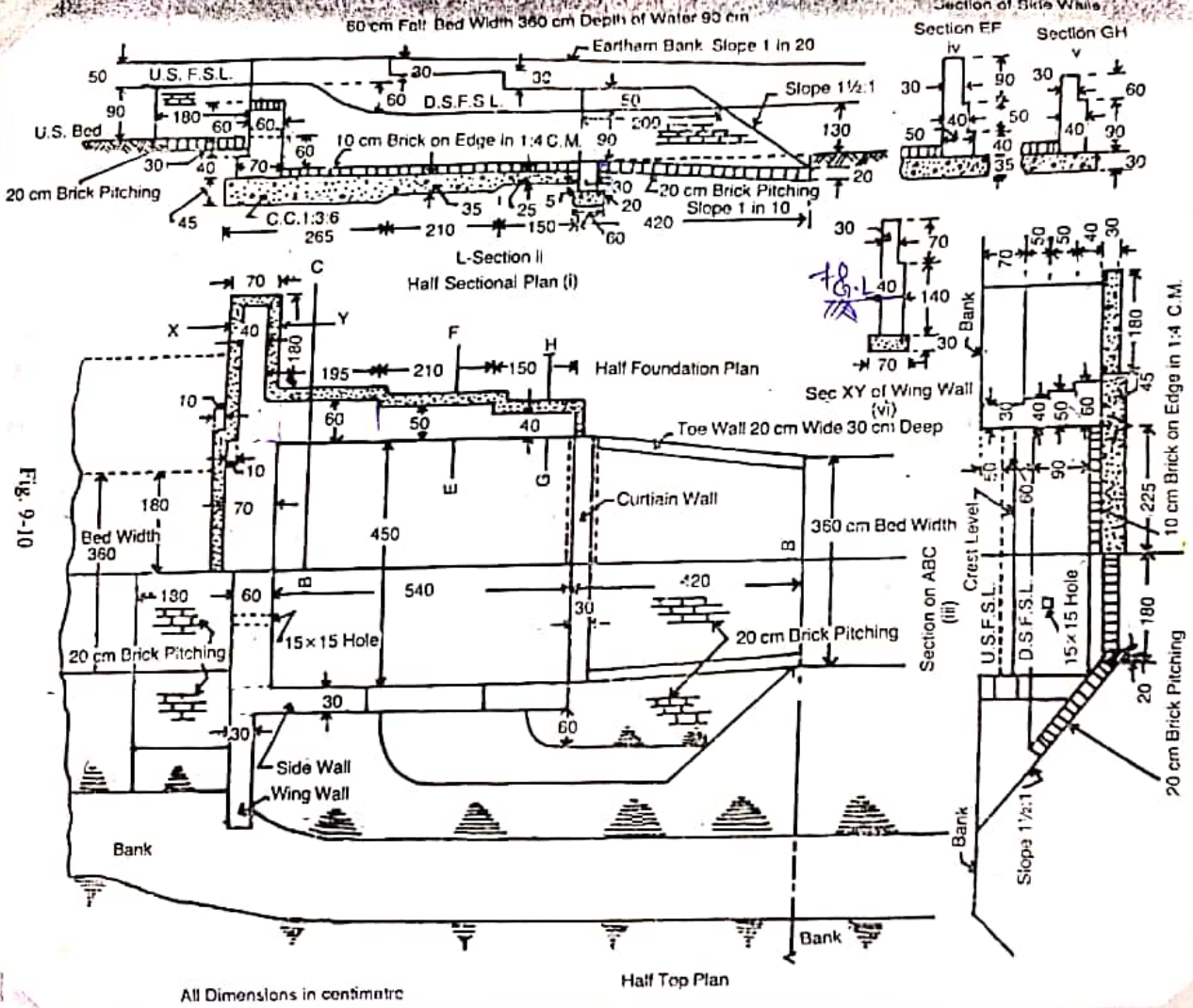


Fig. 9-10

All Dimensions in centimetre

Half Top Plan

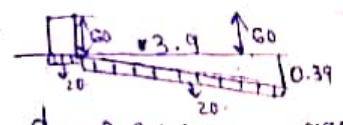
FALL

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No.	Description	NO.	Length	Breadth	Height	Quantity	Explanation
1	Earth work in excavation in foundation						
	Crest wall, side wall & floor taken together						
	Step-1	1	2.65	6	1.15	18.285	$B = 4.5 + 0.6 + 0.6 + 0.15 + 0.15 = 6$
	Step-2	1	2.1	5.8	1.05	12.789	$H = 60 + 10 + 45 = 115$
	Step-3	1	1.5	5.6	0.95	7.98	$B = 50 + 450 + 50 + 15 + 15 = 5.8$
	wing walls	2	1.8	0.7	1	2.52	$H = 60 + 10 + 35 = 1.05$
	Centain wall	1	4.5	0.6	1.2	3.24	$B = 0.4 + 4.5 + 0.4 + 0.15 + 0.15 = 5.6$
	upstream pitching 200m depth	1	1.8	3.6	0.2	1.296	$H = 0.6 + 0.1 + 0.25 = 0.95$
	Bed						$H = 0.7 + 0.3 = 1$
	Side slope upto F.S.L	2	1.8	1.62	1.2 $\frac{0.9}{2}$	1.100	$H = 0.6 + 0.1 + 0.25 + 0.05 = 1.2$
	Downstream channel beyond centain wall including toe wall	1		21.5		21.5	$B = 0.9 \sqrt{1 + \frac{1}{2}^2} = 1.0$ (Sloping breadth)
				$(4.05 \times 0.995) + (\frac{1}{2} \times 0.98)$		3.9	

Downstream side slope curve portion	2	3.1 3.1	1.62	0.2	1.911
	2 x	$\pi r^2 \times$		0.2	= 0.462
Deduction for back of wing wall	2	0.6	0.1	1.15	71.189 0.138
2. Cement concrete work (1:3:6) in foundation Crest wall, sidewall & floor take together	1	2.65	6.0	0.45	7.155
Step-1	1	2.1	5.8	0.35	4.263
Step-2	1	1.5	5.6	0.25	2.10
Step-3	1	1.8	0.7	0.3	0.756
wing wall	2	1.8	0.7	0.3	0.756
curtain wall	1	4.5	0.6	0.2	0.54
Deduction for back of wing wall	2	0.6	0.1	0.45	0.054
					Total = 14.81 m ³
					net total = 14.756

(Bdmt scd_m) x L
 $B = \frac{4.5 + 0.3 \cdot L}{2} = 4.05$
 $L = 4.2 - 0.3 = 3.9$

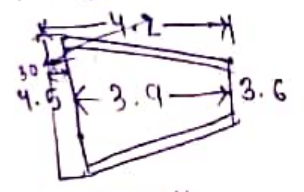


$d_m = \frac{0.8 + 1.19}{2} = 0.995$

$L = \frac{5.012}{2} = 2.506$

$S_p = \frac{4 \pi R^2}{4} = \pi R^2$

$R = 0.6$

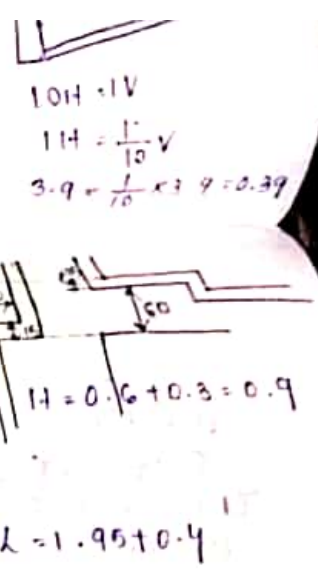


$10H = 1V$

$1H = \frac{1}{10} V$

$3.9 = \frac{1}{10} \times 39 = 3.9$

1	4.5	0.6	0.2	1	
Total = 14.81m ³					
2	0.6	0.1	0.45	0.054	
Total = 14.756					
3. 1st class brickwork 1:4 Cement mortar					
Crest wall				1.26	
1st footing	1	4.5	0.7	0.4	2.43
2nd footing	1	4.5	0.6	0.9	
Side wall					
Step-1	2	2.35	0.6	0.4	1.128
	2	2.35	0.5	0.5	1.175
	2	2.35	0.4	0.5	0.94
	2	2.35	0.3	0.7	0.987
Step-2	2	2.1	0.5	0.4	0.84
	2	2.1	0.4	0.5	0.84
	2	2.1	0.3	0.9	1.134
Step-3	2	1.5	0.4	0.9	1.08
	2	1.5	0.3	0.6	0.54
	3				



Wing wall in footing	2	1.8	0.4	0.4	0.576
	2	1.9	0.4	0.5	0.76
	2	2.0	0.4	0.5	0.8
	2	2.1	0.3	0.7	0.882
Curtain wall Toe wall	1	4.5	0.3	0.4	0.54
	2	3.9	0.2	0.3	0.468
4. Brick on edge floor 1:4 10c.m thick	1	5.4	4.5	—	24.3
5. Brick pitching ^{4/5} Bed side sloping D/s bed side slope Curved portion	1	1.8	3.6	—	6.48
	2	1.8	1.62	—	5.832
	1	3.9	$\frac{4.1+3.2}{2}$	—	14.235
	2	$\frac{4.2+2}{2}$	1.62	—	10.04
	2	$\frac{4 \times 0.6^2}{4}$	—	2.261	
Total =					38.848 m ²

$$4.5 - 0.2 \times 2 = 4.1$$

$$3.6 - 0.2 \times 2 = 3.2$$

$$\frac{4.1 + 3.2}{2} = 3.65$$

$$B = 0.9 \sqrt{1.5^2 + 1^2}$$

$$= 1.62$$

→sidewall top	2	6	0.3	-	3.6
→wingwall top	2	2.1	0.3	-	1.26
→wingwall triangular portion	2	$\frac{1}{2} \times 2.1 \times 1.4 =$		-	2.94
→curtainwall top	1	4.5	0.3	-	1.35
→Toe wall	2	3.9	0.2	-	1.56
Total =					42.45m ²

