

# PNS School of Engineering & Technology

Nishamani Vihar, Marshaghai, Kendrapara

Internal Assessment Examination-2022(5th Semester)

Subject : Th-5 -Estimation & Cost Evaluation- II

Branch : Civil Engineering

Time :  $1\frac{1}{2}$  Hours

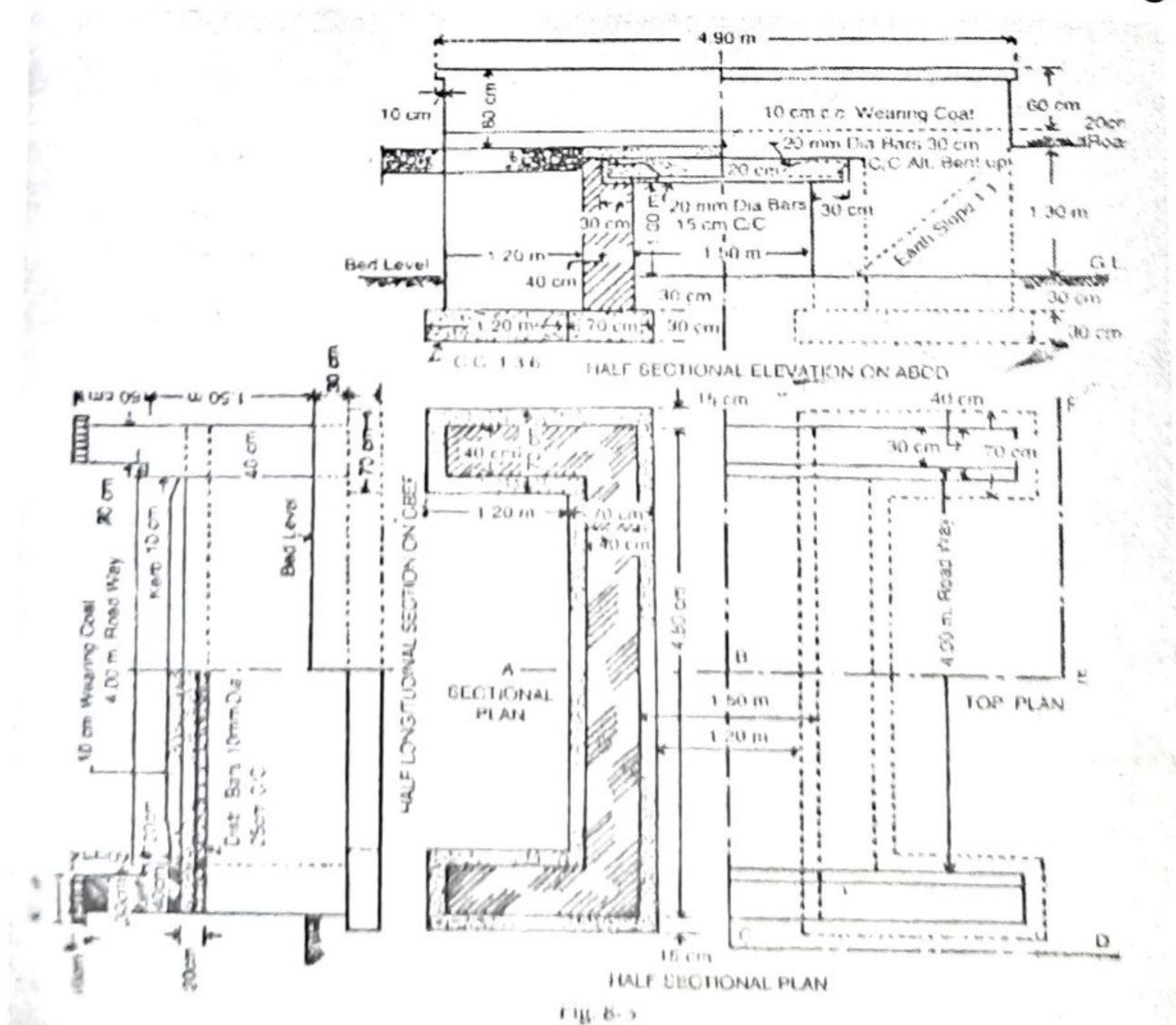
F.M. : 20

1. Answer the following questions.
  - (a) Detailed estimate of a road with cutting and banking. Where R.L. of ground along the centre line of a proposed road from chainage 10 to chainage 20 are given below. The F.L. at the 10th chainage is 107 and the road is in downward gradient as 1 in 150 up to the chainage 14 and then the gradient changes to 1 in 100 downward. Formation width=10M and side slope= 2 :1. Length of chain = 30M.  
→ Find area of slope.

Chainage	10	11	12	13	14	15	16	17	18	19	20
R.L of G.L	105.00	105.60	105.44	105.90	105.42	104.30	105.00	104.10	104.62	104.00	103.30

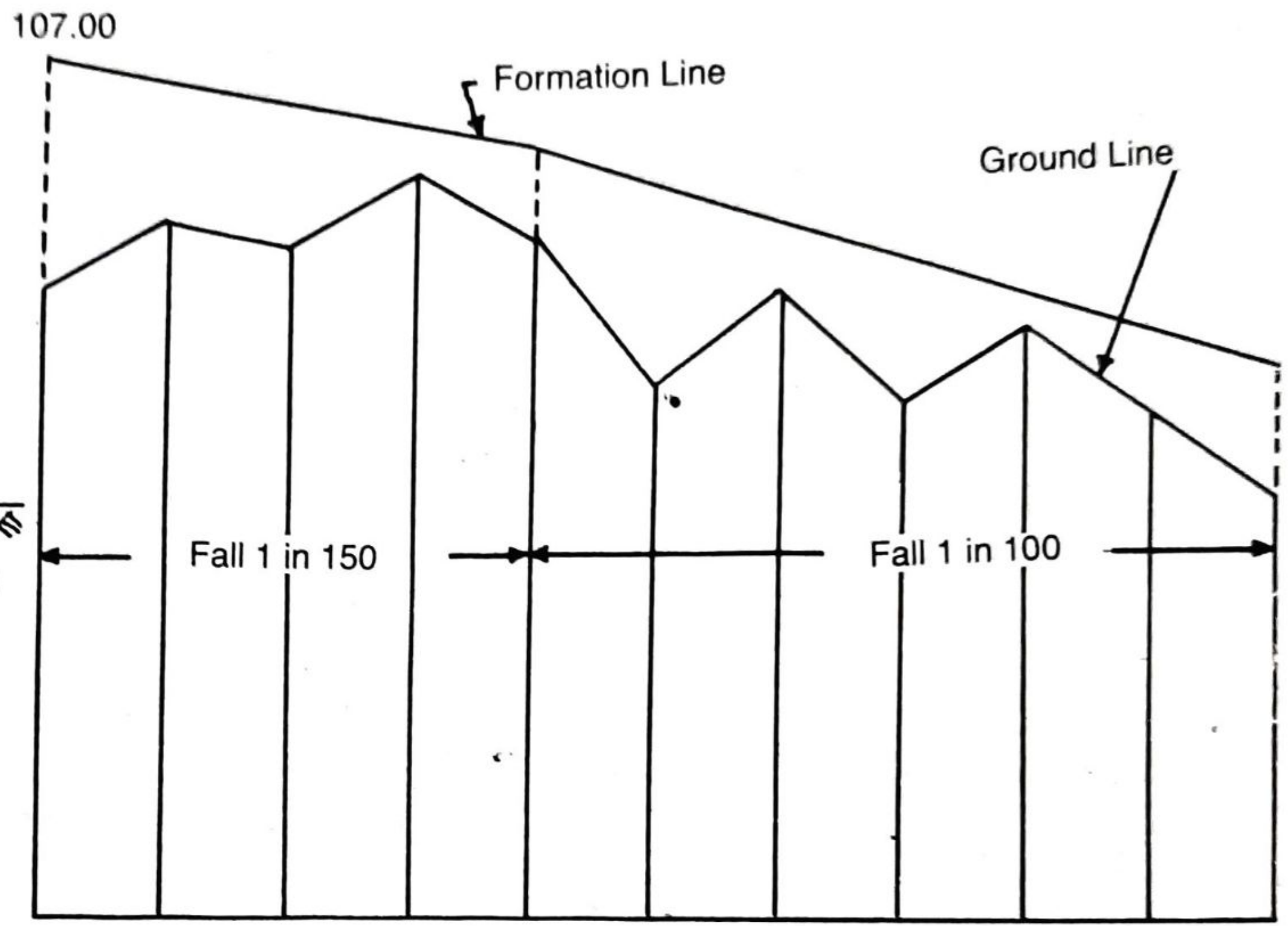
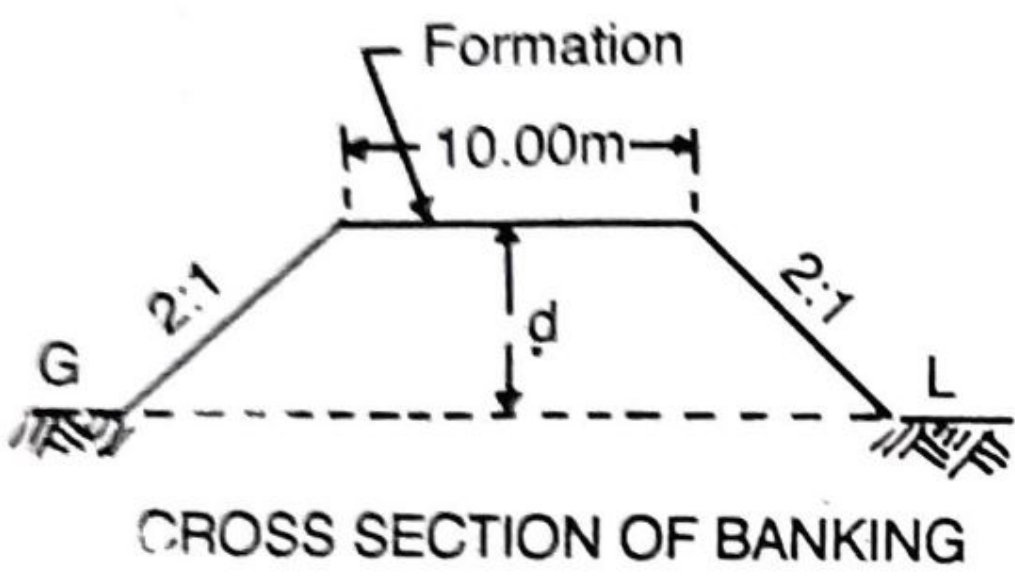
R.L of formation 107.00

- (b) Detailed estimate of a RCC Slab Culvert with right angled ceiling walls with bar bending schedule as shown in figure.





1(a)



Datum Line	100										
Depth of Cutting											
Height of Bank	2.00	1.20	1.16	0.50	0.78	1.60	0.60	1.20	0.38	0.70	1.10
R.L. of Formation	107.00	106.80	106.60	106.40	106.20	105.90	105.60	105.30	105.00	104.70	104.40
R.L. of Ground	105.00	105.60	105.44	105.90	105.42	104.30	105.00	104.10	104.62	104.00	103.30
Distance in Metre Chainage	300	330	360	390	420	450	480	510	540	570	600
	10	11	12	13	14	15	16	17	18	19	20

I-SECTION



Stations or Chain- age	Length m	Height or Depth Diff. of G.L. and F.L. m	Mean height or depth d m	Central area Bd m <sup>2</sup>	Side area sd <sup>2</sup> m <sup>2</sup>	Total sec. area Bd+sd <sup>2</sup> m <sup>2</sup>	Length in betw. stations L m	Quantity (Bd+sd <sup>2</sup> ) $\times$ L	
								Banking m <sup>3</sup>	Cutting m <sup>3</sup>
10	300	2.00	—	—	—	—	—	—	—
11	330	1.20	1.60	16.00	5.12	21.12	30	633.6	—
12	360	1.16	1.18	11.80	2.78	14.58	30	437.4	—
13	390	0.50	0.83	8.30	1.38	9.68	30	290.4	—
14	420	0.78	0.64	6.40	0.82	7.22	30	216.6	—
15	450	1.60	1.19	11.90	2.83	14.73	30	441.9	—
16	480	0.60	1.10	11.00	2.42	13.42	30	402.6	—
17	510	1.20	0.90	9.00	1.62	10.62	30	318.6	—
18	540	0.38	0.79	7.90	1.25	9.15	30	274.5	—
19	570	0.70	0.54	5.40	0.58	5.98	30	179.4	—
20	600	1.10	0.90	9.00	1.62	10.62	30	318.6	—

Total 3513.6 cu m

### ABSTRACT OF ESTIMATED COST (Ex. 3)

Item No.	Particulars of items	Quantity	Unit	Rate Rs. P.	Per	Cost	
						Rs.	P.
1	Earthwork in banking ...	3513.6	cu m	275.00	% cu m	9662.40	
Total ...						9662.40	
Add 5% (3% for Contingencies and 2% for Workcharged Establishment) ...						483.12	
Grand Total ...						Rs. 10145.52	



21

Item No.	Particulars of items of works	No.	Length m	Breadth m	Height or Depth m	Quantity	Explanatory notes
1.	<b>Earthwork in excavation</b> in foundation —						
	Abutments ...	2	5.10	0.70	0.60	4.28	
	Wings walls ...	4	1.20	0.70	0.60	2.02	
					Total	6.30	cu m
2.	<b>Cement concrete 1:3:6</b> in foundation with stone ballast—						
	Abutments ...	2	5.10	0.70	0.30	2.14	$\left\{ \begin{array}{l} \frac{1}{2} \text{ of earthwork} \\ \text{in excavation in} \\ \text{item 1.} \end{array} \right.$
	Wings walls ...	4	1.20	0.70	0.30	1.01	
					Total	3.15	cu m
3.	<b>I-class brickwork in 1 : 4 cement mortar—</b>						
	Abutments ...	2	4.80	0.40	1.50	5.76	$\left\{ \begin{array}{l} \text{Up to top of} \\ \text{R.C.C. slab.} \\ \text{Above R.C.C.} \\ \text{slab up to kerb.} \\ \text{Above kerb} \\ \text{excluding coping.} \end{array} \right.$
	Wing walls ...	4	1.20	0.40	1.50	2.88	
	Parapets up to kerb ...	2	4.70	0.40	0.30	1.13	
	Parapets above kerb ...	2	4.70	0.30	0.50	1.41	
	Parapet coping ...	2	4.90	0.40	0.10	0.39	
					Total	11.57	
4.	<b>Deduct—</b> Bearing of R.C.C. slab in abutment	2	4.80	0.30	0.20	0.57	
	<b>R.C.C. work 1 : 2 : 4 in slab</b> excluding steel and its bending but including centering shuttering and binding steel	1	4.80	2.10	0.20	2.016 cu m	No deduction for volume of steel.
				Net	Total	11.00	cu m
5.	<b>Steel bars including bending in R.C.C. work—</b> 20 mm dia. bars— Main straight bars 30 cm c/c ...	17	2.38	—	—	40.46 cu m	$L=2.10-2 \text{ side covers} \\ + 2 \text{ hooks} = 2.10- \\ (2 \times 4 \text{ cm}) + (18 \times \\ 20 \text{ mm}) = 2.38 \text{ m}$
	(No. = $\frac{4.80}{30} + 1 = 17$ )						



Particulars of items of works	No.	Length m	Breadth m	Height or Depth m	Quantity	Explanatory notes
Main bent up bars 30 cm c/c (No. = $\frac{4.80}{.30} = 16$ )	16	2.54	—	—	40.64 m	Adding one depth, 16 cm for two bent ups $L=2.38+.16 =$ 2.54 m
		Total	81.10 m	@ 2.47	kg m= 200.32kg	
10 mm Dia. bars— Distributing bottom bars 25 cm c/c	9	4.90	—	—	44.10 m	$L=4.80-2$ end covers +3 hooks $=4.80-(2 \times 4 \text{ cm})$ + $(18 \times 10\text{mm}) =$ 4.90 m
Distributing top bars	4	4.90	—	—	19.60 m	
<b>Total</b>		63.70 m	@ .62 kg	=	39.49 kg	
		Total	of	steel	239.81 kg	2.398 quintal
6. Cement concrete 1:2:4 wearing coat	1	4.00	2.30	0.10	0.92 cu m	In between parapets
7. Cement pointing 1:2 in walls— Face wall from 10 cm below G.L. up to bottom of coping	2	4.70	—	2.10	19.74	Ht. = $(20+10+50)$ $= 0.80$ mm
Inner side of parapet excluding coping	2	4.70	—	0.80	7.52	
Coping (inner edge, top, outer edge and outer and side)	2	4.90	0.70	—	6.86	$B=(10+40+10+10)$ cm = 0.70 m
Ends of parapet	4	—	0.40	0.20	0.32	Up to kerb.
Ends of parapet	4	—	0.30	0.50	0.60	Above kerb.
Ends of coping	4	—	0.40	0.20	0.32	Edge and under side.
				Total	35.36	Including 10 cm below G.L. and edge of R.C.C. slab.
<b>Deduct—</b> Rectangular opening	2	1.50		1.30	3.90	
Triangular portion below earth slope	2	$(\frac{1}{2} \times 1.30 \times 1.30)$			1.69	
		Total of	deductio	n	5.59	
		Net	Total		29.77	sq m