MODEL – 3

[CET - 604]

Time – 3 Hours **Full Marks – 70**

Answer **five** Questions including No.**1 and 2**

Figures in the right-hand margin indicate marks

1. Answer the following questions.

(a) What do you mean by cost plus percentage contract ?

(b) Explain the purpose of security deposit.

(c) When is final payments due and what may delay its execution.

(d) Prepare a list of contract documents (8 nos).

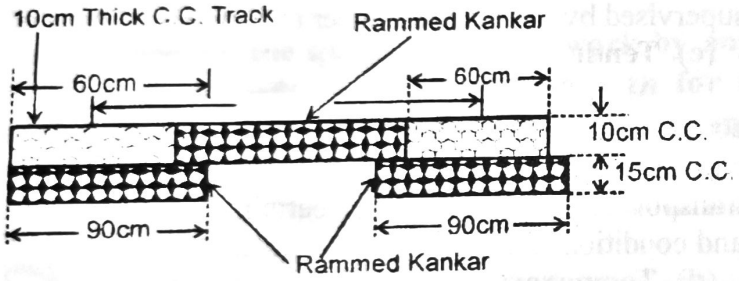
(e) What is use of Measurement Book ?

(f) What do you mean you suspense account ?

(g) What is book transfer roll ?

(h) What is Acquittance roll ?

2. Prepare an estimate for one kilometer length of a cement concrete trackway with 60 cm wide tracks 1.50 mt centre to centre over 15mm Rammed Kankar. Refer Figure.



3. Find a detailed estimate of a slab culvert of 1.50 metre span and 4.00 metre roadway from the given drawing (Fig.3). The general specifications are as follows.

Foundation concrete shall be of cement concrete 1 : 3 : 6 with stone ballast and coarse sand. Masony shall be first class brickwork in 1 : 4 cement coarse sand mortal slab shall be of R.C.C. 1 : 2 : 4 w ith reinforcement as per drawing. Exposed surface of brick masonry shall be cement pointed 1 : 2. Road shall be provided with 10cm thick wearing coat of 1 : 2: 4 cement concrete.

Assume any other suitable date. (Refer Fig.3)

(a) Earthwork in excavation.

(b) Cement concrete in foundation.

(c) I-class brickwork in 1 : 4 cm.

(d) Steel bars including bending in RCC work.

(e) Cement pointing 1 : 2 in walls.

4. Find a detailed estimate of a drainage Syphon across a minor from the given drawing Fig.4 :1 and 4 :2.

Specification : 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 with straight over burnt bricks. (Refer Fig. 401 and Fig. 4.2).

(a) Earthwork in excavation in foundation.

(b) Cement concrete 1:4:8 with brick ballast.

(c) First class brickwork.

(d) 10cm thick brick floor.

(e) Cement struck pointing.

ANSWER TO MODEL – 3

1.(a) What do you mean by cost plus percentage contract ?

Ans. In tendering for work on a "Cost Plus" basis the contractor is paid the actual cost of work, plus an agreed percentage in addition, to allow profit. This type of contract is generally adopted when conditions are such that labour and materials rate are liable to fluctuate.

In adopting this system of tendering no "Bill of quantities" or "Schedule of rate" has to be framed but the owner or department should carefully define the actual cost and record exactly what is permissable in the cost of the work.

(b) Explain the purpose of security deposit.

Ans. Earnest money is an assurance or gurantee in the form of cash on the part of the contracter to keep open the offer for considiration and to conform his intention to take up the work accepted in his favour for exicution as performs and conditions in the tender. The

amount of earnest money not large it may be deposited in cash in division or sub-division office. The earnest money given by the contractors except the three lowest tender should be returned with in a week will or 15 days of the except once of the tender if their offers not considirate. The earnest mony of the lowest tenderer whose tender is normaly excepted is kept by the department is security deposits for the due performance of the construct.

Security deposite : This deposite is an ammount of money which shall be deposited by the contracter whose tender has been accepted in order to render himself laible to the department to pay compansation amounting being if the work is not satisfactory alone according to the specification. This deposite may be refundable after the work has been complited after certain time. Whose maintanence period is over.

(c) When is final payments due and what may delay its execution.

Ans. Final payment is to be made within three month from the date of issue of certificate of final completion. The above procedure is followed in case of final payment to suppliers also. The points which are specially to be booked is to before final payment are as follows.

(i) The work is complete as per specification and the site has been left cleaned. No damage has been cause to other preperties and no defect is found.

(ii) The measurements recorded are in accordance with the method prescribed in the contract, i.e. dimensions recorded as per drausing.

(iii) The Test Check of the measurement and various other tests prescribed in each type of work have been conducted by the authorities and found in order. If the above conditions not fulfilled then delay its execution will be held.

(d) Prepare a list of contract documents (8 nos).

Ans. Engineering contract documents usually contain the following.

(1) Title page. (2) Index (3) Tender notice (4) Letter of aceuptance of Tender and written order to commance work. (5) Any letter given by the contractor with the tender is clarification of rate or term there in (6) Tender form. (7) Conditions of contract. (8) Additional Conditions. (9) Schedule of items of work (10) General and additional specification.

(e) What is use of Measurement Book ?

Ans. A set of measurement book containing detailed measurement of specific buildings and structures maintained by each subdivision is kept to faciliitates framing of annual repairs estimates and for payment to constructs for job connected there with. There M. b's are known as standard measurement books. The S.M. Bs save time and labour of the department officers from repeated work of taking detailed measurements of the same building again and again.

(f) What do you mean you suspense account ?

Ans. Suspense Account : These accounts are meant for the temporary transaction of all such transaction and must at once be taken into account of the works of grant concerned but can not be cleared finally because the relevant payment, recovery or adjustment is allowed.

Imprest : An imprest is a standing advance of a fixed sum of money given to asst. Engineer and Sub asst. Engineer to enable them to make day to day petty payments for proper discharge of their duties. In the end of the month an account for that expenditure will be made and will be sent to executive engineer for his knowledge and the balance amount after the expenditure will be noted.

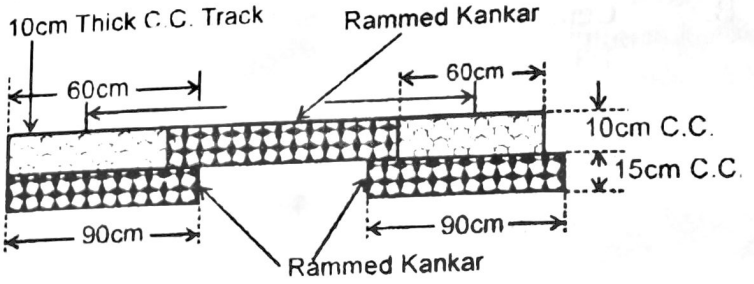
(g) What is book transfer roll ?

Ans. This means the adjustment of fund without involvement by direct cash from receipt to payment and vice-versa for balancing the fund. This is generally done in accounting system.

(h) What is Acquittance roll ?

Ans. Acquitance roll is payment of salary to pertions of regular establishment paied in regular pay bill. But the payment is made on sepuret receipt form known as acquitance roll in which the persion should sign on duely revinue stamp against his name. This is the avidance of payment to the persion.

2. Prepare an estimate for one kilometer length of a cement concrete trackway with 60 cm wide tracks 1.50 mt centre to centre over 15mm Rammed Kankar. Refer Figure.



Ans. Prepare an estimate for one kilometer length of a cement concrete trackway with 60cm aride tracks 1.50 mt centre to centre over 15 cm Rammed Kankar.

Sl. No.	Particulars of	No	Length (M)	Breadth (M)	Thickness (M)	Quantity (M)
1.	Cement concrete 1:2:4 in tracks including laying	2	1000m	0.60m	0.10m	120cm
2.	Kankar metal loose (with 1/2 allowance for compaction) Under C.C. trancks In between C.C track	2	1000m	0.60m	0.20m	360cm
3.	Laying and consolidation of Karnkar metal	1	1000m	0.60m	0.133m	120cm **Total 480cm** same as above 480cm.

3. Find a detailed estimate of a slab culvert of 1.50 metre span and 4.00 metre roadway from the given drawing (Fig). The general specifications are as follows.

Foundation concrete shall be of cement concrete 1 : 3 : 6 with stone ballast and coarse sand. Masony shall be first class brickwork in 1 : 4 cement coarse sand mortal slab shall be of R.C.C. 1 : 2 : 4 w ith reinforcement as per drawing. Exposed surface of brick masonry shall be cement pointed 1 : 2. Road shall be provided with 10cm thick wearing coat of 1 : 2: 4 cement concrete.

Assume any other suitable date. (Refer Fig)

(a) Earthwork in excavation.

(b) Cement concrete in foundation.

(c) I-class brickwork in 1 : 4 cm.

(d) Steel bars including bending in RCC work.

(e) Cement pointing 1 : 2 in walls.

Ans.

Sl.No.	Particulars of items of work	No	Length (M)	Breadth (M)	Height of Depth (M)	Quantity	Remark
A.	Earthwork in excavation in foundation						
	(i) Abutments	2	5.10	0.70	0.60	4.28	
	(ii) Wing walls	4	1.20	0.70	0.60	2.02	
B.	Cement concrete 1:3:6 in foundation with stone ballast						
	Abutments	2	5.10	0.70	0.30	1.01	1/2 of earth work in
	wing walls	4	1.20	0.70	0.30	2.14	escavation in item 1
					Total	**3.15cm.**	
C.	1-class brickwork in 1 : 4 cement mortar Abutments	2	4.80	0.40	1.50	5.76	upto top of RCC slab

Sl.No.	Particulars of items of work	No	Length (M)	Breadth (M)	Height of Depth (M)	Quantity	Remark
	wing walls	4	1.20	0.40	1.50	2.88	Above R.C.C. slab
	Parapets upto kerb	2	4.70	0.40	0.30	1.13	kerb
	Parapets above kerb	2	4.70	0.30	0.50	1.14	Above kerb excluding coping
	Parapet coping	2	4.90	0.40	0.10	0.39	
					Total	**11.57**	
	Deduct Bearing of RCC slab in abutment	2	4.80	0.30	(–) 0.20	0.57	
					Net Total	**11.00 cm.**	
D.	Steel bars including in RCC work 20mm dia bars main straight bars 30cm c/c.	17	2.38	–	–	40.46cm	L = 2.10 – 2 side converts +2 hooks = 2.10 – 2 × 4cm + (18×20mm) = 2.38m
	$\left(\text{No.} = \frac{4.80}{0.30} + 1 = 17\right)$						
	Main bent up bars 30 cm c/c.	16	2.54	–	–	40.84cm	adding one effective depth. 16cm for two bent ups L = 2.38+16 = 2.54m
	$\left(\text{No.} = \frac{4.80}{0.30} = 16\right)$						
			Total 81.10m 2.47 kg per M200.32 kg				
	10mm dia bars Distributing bottom bars 25cm c/c.	9	4.90	–	–	44.10cm	L = 480 – 2 end cover + 3 hooks = 4.80 – (2×4cm)+ (18×10mm) = 4.90m
	Distributing top bars	4	4.90	–	–	19.60M	
				Total 63.70 @ 62 kg = 39.49 kg.			

Sl.No.	Particulars of items of work	No	Length (M)	Breadth (M)	Height of Depth (M)	Quantity	Remark
	Continuation of item no.			Total of steel 239.81 kg = 2.98 quantital			
E.	Current pointing 1:2 in walls face wall from 10cm below GL upto bottom of coping	2	4.70	–	2.10	19.74	
	Inner side of parapet excluding coping	2	4.70	–	0.80	7.52	Ht = (20 + 10 + 50) = 0.80 mm.
	Coping (inner edge, top, outer, edge and outer side)	2	4.90	0.70	–	6.86	b (10+40+10+10cm) = 0.70m.
	Ends of parapet	4	–	0.40	0.20	0.32	upto kerb
	Ends of parapet	4	–	0.30	0.50	0.60	above kerb
	Ends of coping	4	–	0.40	0.20	0.32	edge of under side
	Inner face of Abutment	2	4.8	–	1.1	1.56	
	DEDUCT					45.92 cm	
	Rectangular opening	2	1.50	–	1.20(–)	3.90	including 10cm below G.L.
	Triangular position become earth slope	4	–	(1/2×1.3×1.3)	(–)	1.69	
				Total Dedection		**5.69**	
				Net Total = 45.92 – 5.59 = 40.33 Sqm.			

4. Find a detailed estimate of a drainage Syphon across a minor from the given drawing Fig.4 :1 and 4 :2.

Specification : 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 with straight over burnt bricks. (Refer Fig. 401 and Fig. 4).

(a) Earthwork in excavation in foundation.

(b) Cement concrete 1:4:8 with brick ballast.

(c) First class brickwork.

(d) 10cm thick brick floor.

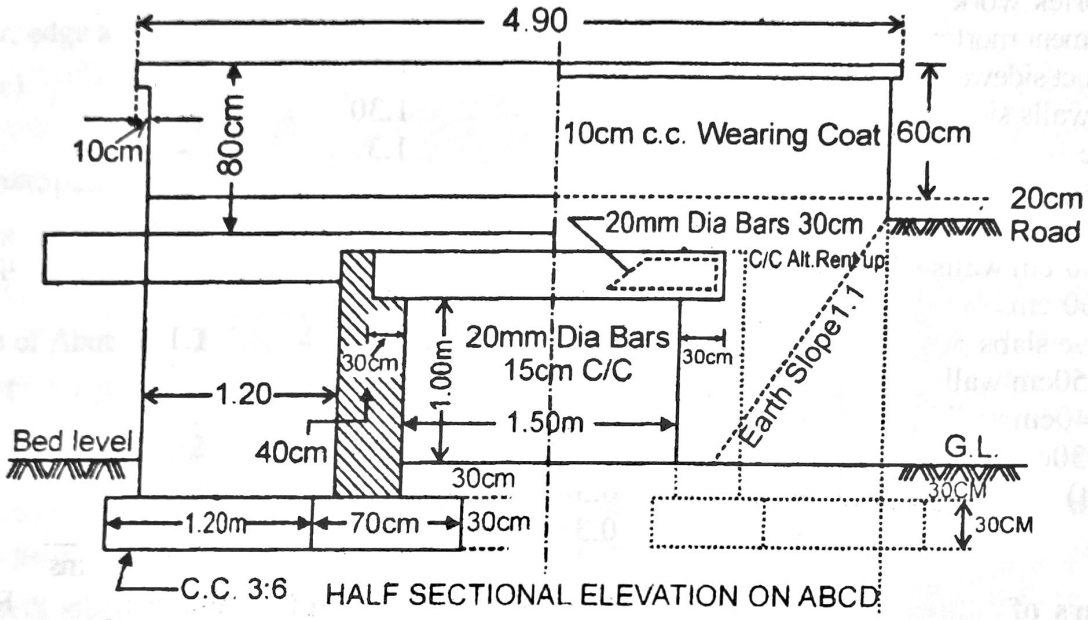
(e) Cement struck pointing.

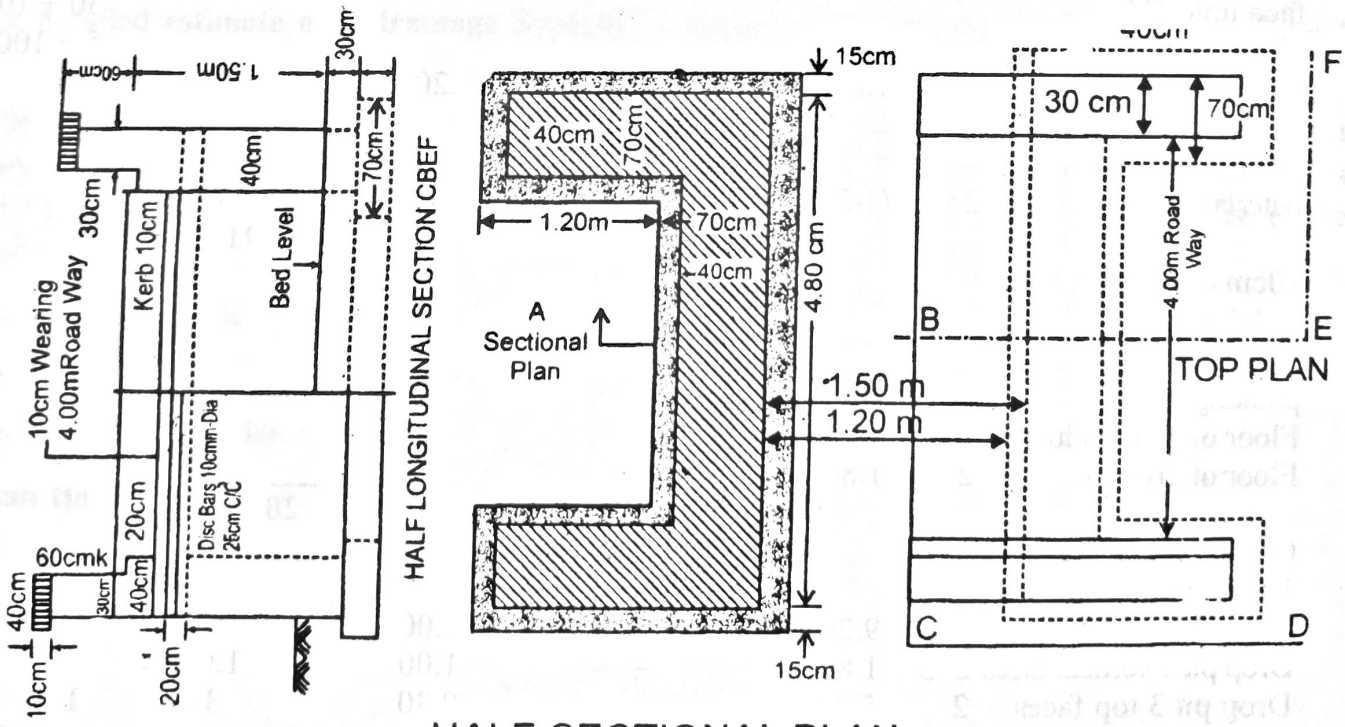
Ans:

Sl.No.	Particulars of items of work	No	Length (M)	Breadth (M)	Height of Depth (M)	Quantity	Remark
(a)	Earthwork in excavation in foundation						
	–Syphon duct	1	9.50	2.40	1.60	36.48	For bid level
	–Drop pit	2	2.10	2.70	1.60	18.14	of nala
	–wing walls	4	1.25	1.10	1.00	8.80	
					Total	**63.42 cms**	
(b)	Cement concrete 1:4 : 8 with brick ballast						
	–Syphon duct	1	9.50	2.40	0.30	6.84	
	–Drop pit	2	2.10	2.70	0.30	3.40	
	–wing walls	4	1.25	1.10	0.30	1.65	
					Total	**11.89 cms**	
(c)	1st class brick work in 1 : 4 cement mortor						
	-Syphon duct sidewalls	1	9.20	0.30	1.30	7.18	
	-Drop pit walls side	2×2	2.10	0.30	1.30	3.28	
	Front side	2	1.80	0.30	1.3	1.40	
	-wing walls						
	1st step 70 cm walls	4	1.25	0.70	0.70	2.45	
	2nd step 60 cm walls	4	1.25	0.60	0.60	1.80	upto top of slab
	2nd step 60 cm walls above slabs	2	4.60	0.60	0.20	1.10	
	-3rd step 50cm wall	2	4.60	0.50	1.00	4.60	
	-4th step 40cm wall	2	4.60	0.40	0.80	2.94	
	-5rd step 30cm wall (Parapet)	2	4.60	0.30	0.30	0.83	
	Coping	2	4.70	0.35	0.10	0.33	
					Total	**11.89 cms**	

Sl.No.	Particulars of items of work	No	Length (M)	Breadth (M)	Height of Depth (M)	Quantity	Remark
	Parapet wall inner face top and outer face upto G.L.	2	4.60	–	2.30	21.16	Ht = 20 + 10 30 + 10 + 35 + 10 + 5 + 100 = 2.30cm.
	Outer face of wing wall above slab.	2	1.80	–	1.20	4.32	
	Triangular portion of outerface of wing wall	2×2	(1/2×.8×.8)	–	–	1.28	
					Total	**25.91 cms**	
(d)	10cm thick brick floor in 1:3 cement mortar including 1:2 cement pointing						
	Floor of syphonduct	1	9.20	1.50	–	13.80	
	Floor of drop pit	2	1.80	1.80	–	6.48	
					Total	**20.28 kg.**	
(e)	Current struck pointing 1 : 2– syphon duct				1.00	18.40	
	inner faces.	2	9.20	–	1.00	12.96	
	Drop pit 3 vertical faces	2×3	1.80	–	0.30	3.42	L = 2 × 180 + 210 = 570 cm.
	Drop pit 3 top faces	2	5.70				

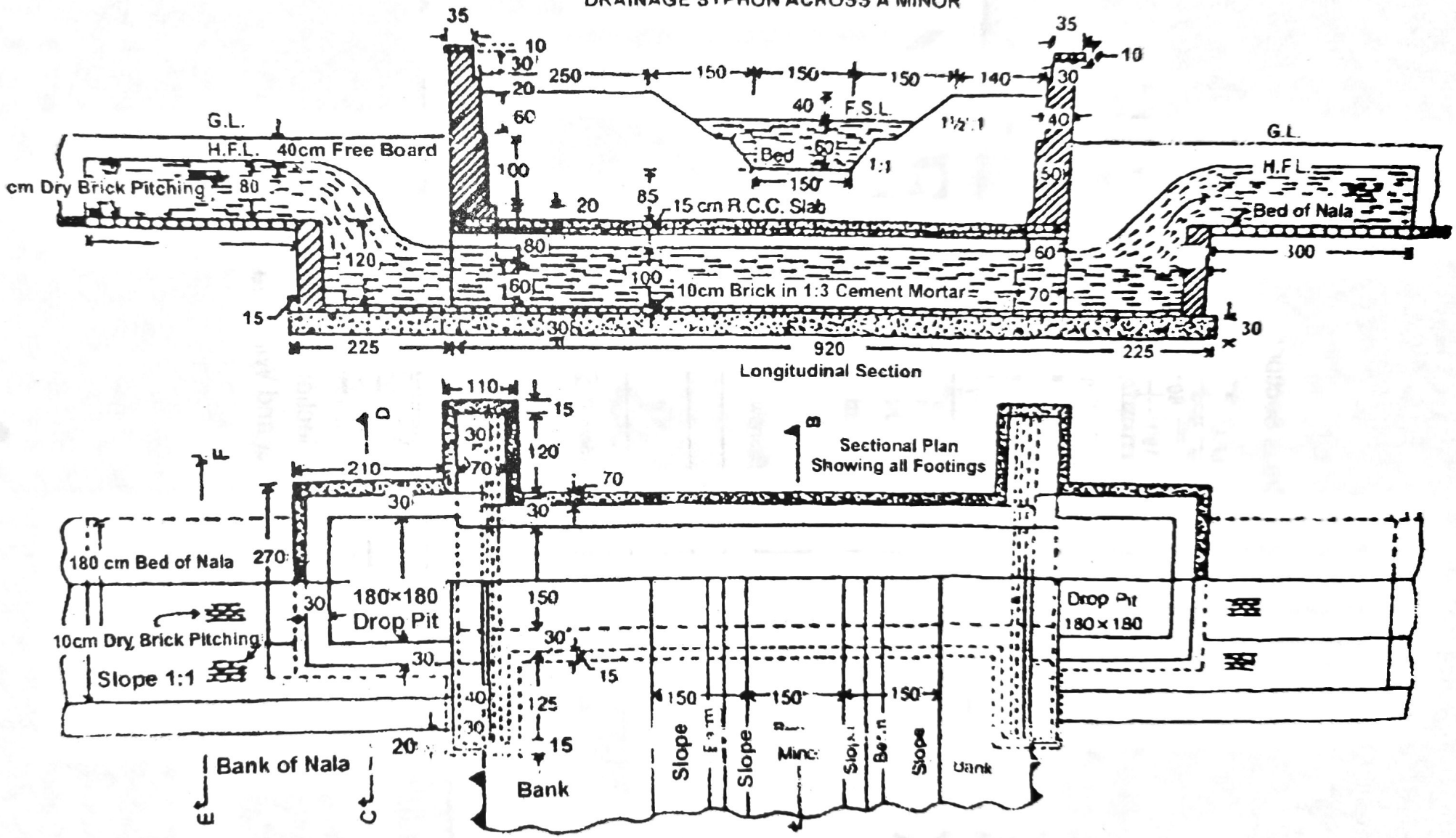
Sl.No.	Particulars of items of work	No	Length (M)	Breadth (M)	Height of Depth (M)	Quantity	Remark
	Parapet wall inner face top and outer face upto G.L.	2	4.60	–	2.30	21.16	Ht = 20 + 10 30 + 10 + 35 + 10 + 5 + 110 = 230 cm
	Outer face of wing wall above slab.	2	1.80	–	1.20	4.32	
	Triangular portion of outerface of wing wall	2 × 2	(½ × 8 × 8)	–	–	1.28	
					Total	**61.54 Sqm**	



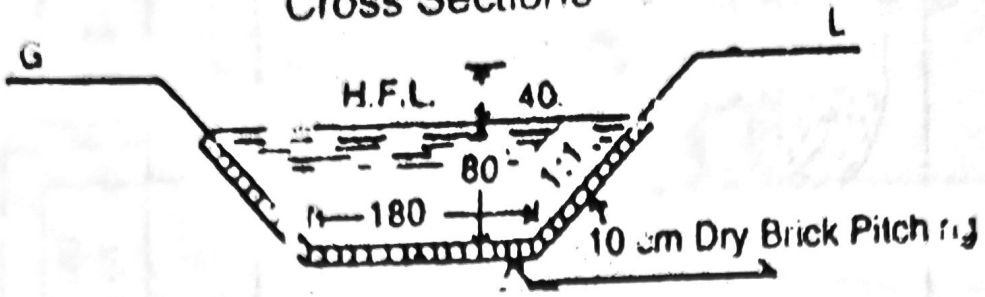


HALF SECTIONAL PLAN

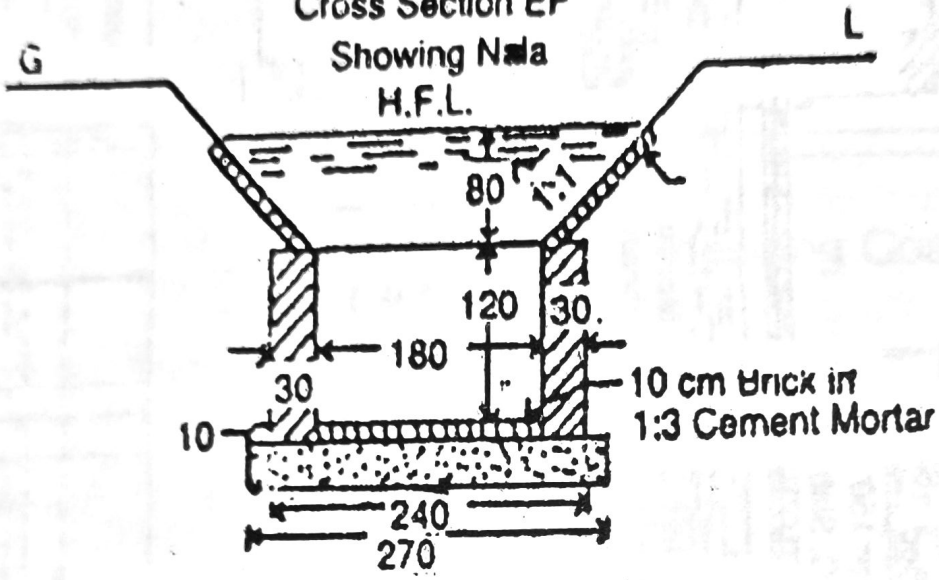
DRAINAGE SYPHON ACROSS A MINOR



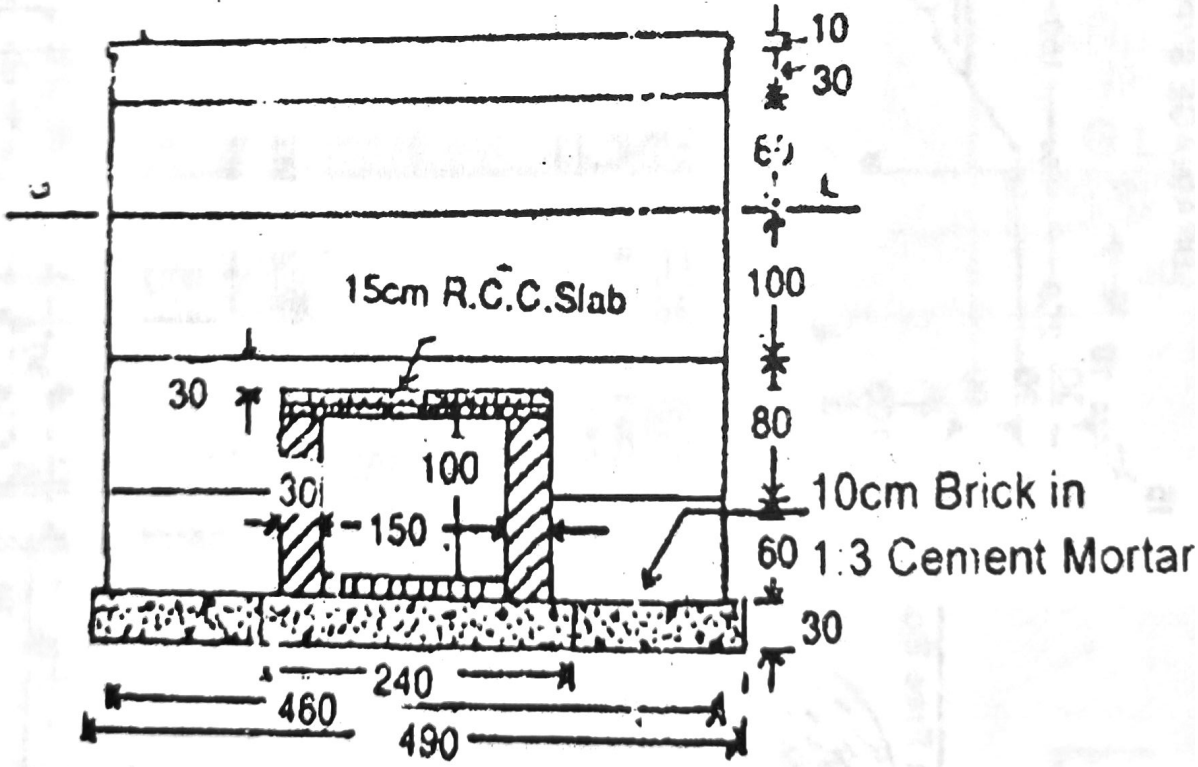
Cross Sections



Cross Section EF
Showing Nala



Cross Section CD Showing Drop Pit and Nala



Cross Section AB
Showing Duct and Wing Walls