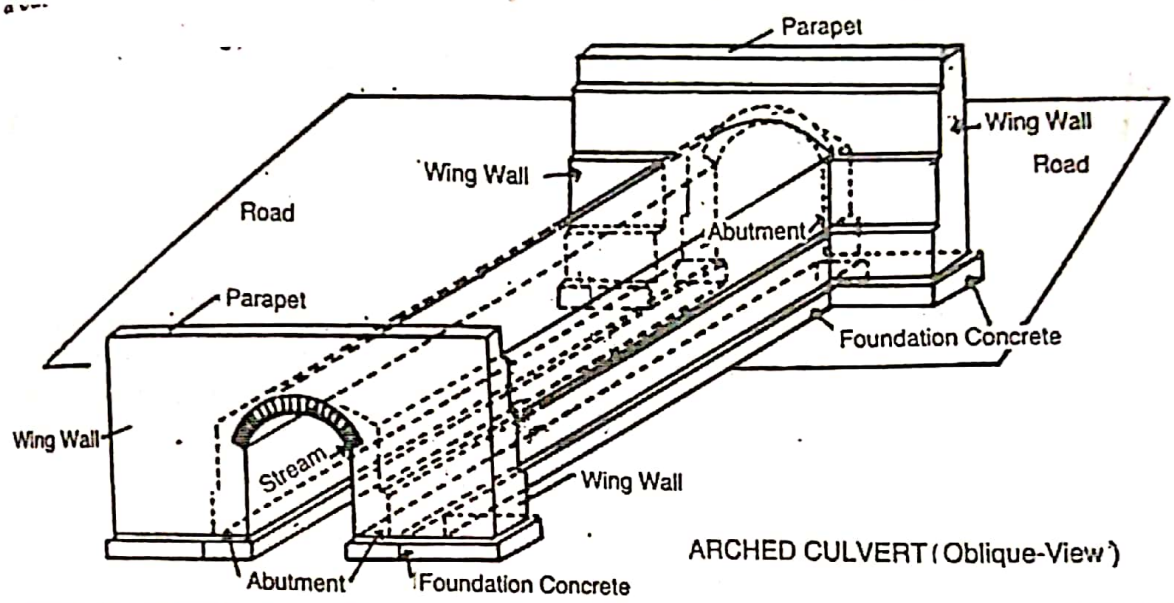
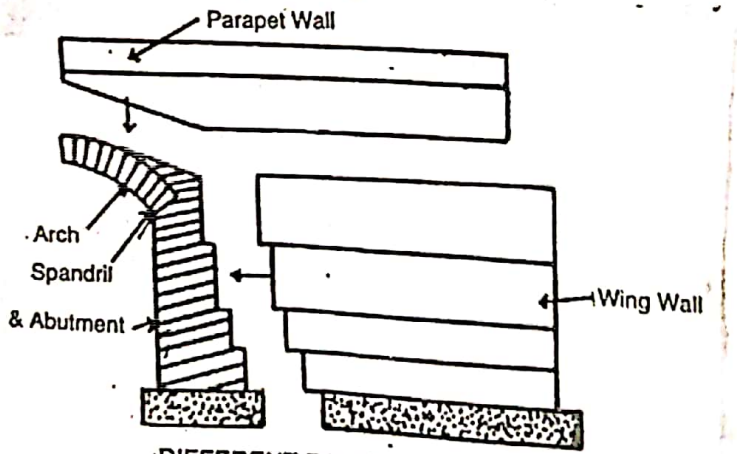
CULVERTS

A tunnel carrying a stream or open drain under a road or railway can be called as culvert.

A culvert consists of abutments, wing walls, arch, parapets, headwall, wing wall, Foundation concrete, culvert inlet, culvert outlet, culvert pipe etc.,



ARCHED CULVERT (Oblique-View)



DIFFERENT PARTS OF CULVERT

For estimating, different parts of estimated seperately. First the with foundations then the four foundations up to haunch level Parapet walls should be estimat Should be calculated seperatel of surfaces is taken up lastly.

→ Prepare a detailed estimate of

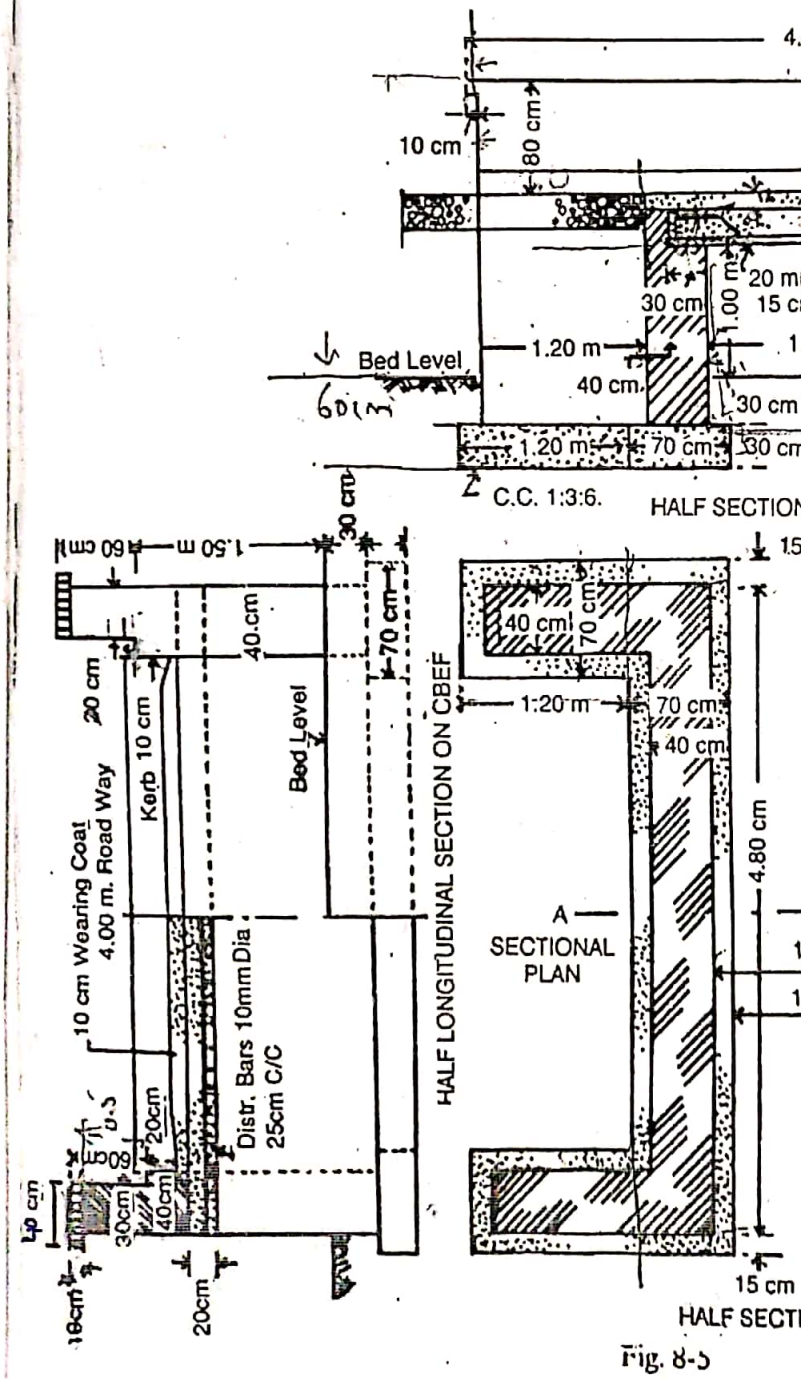


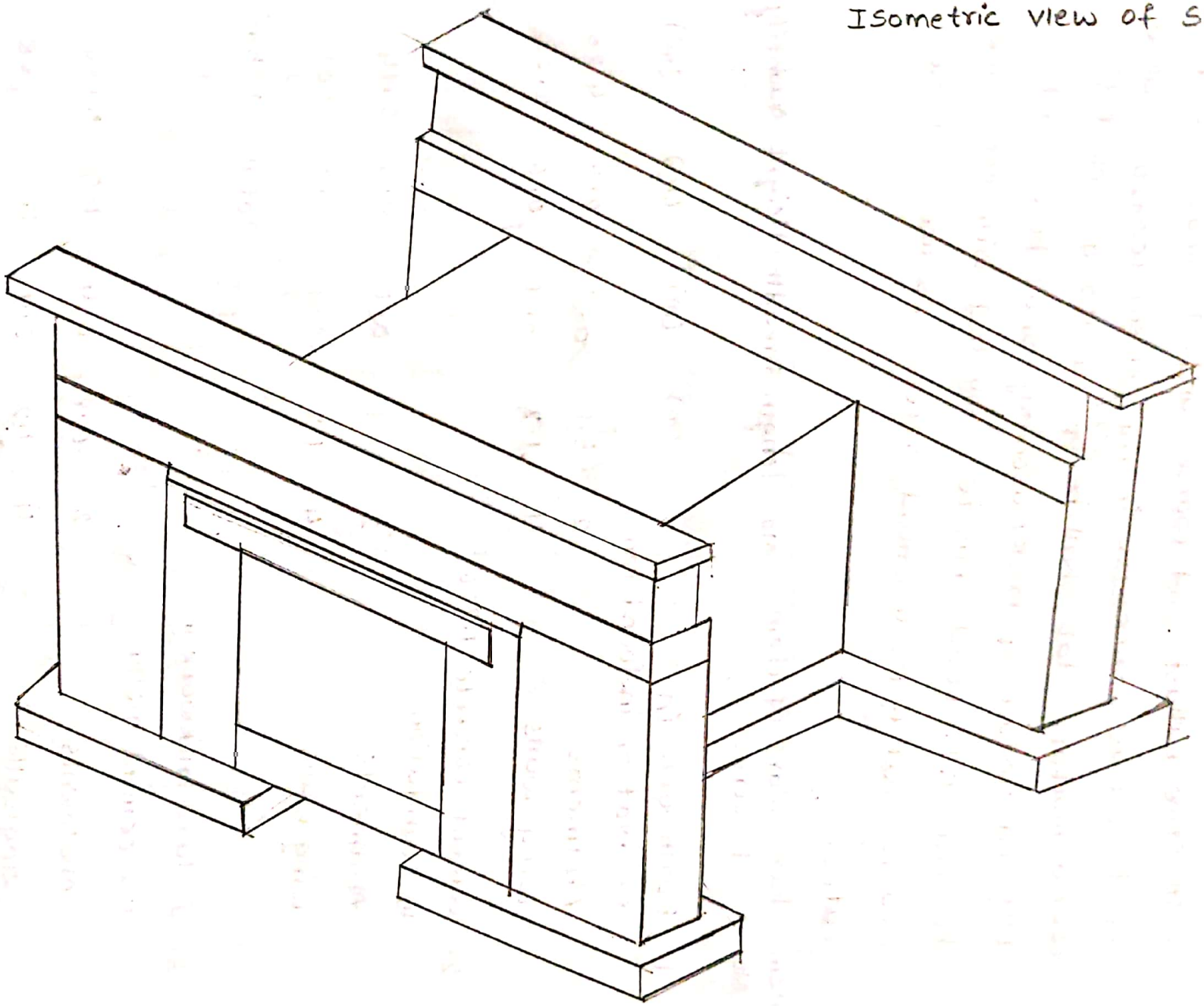
Fig. 8-5

1·5m span and 4m roadway from the given drawing. General specifications are as follows:

→ Foundation concrete shall be of cement concrete 1:3:6 with stone ballast and coarse sand. Masonary shall be of first class brickwork in 1:4 cement ~~concrete~~ coarse sand mortar. Slab shall be of RCC 1:2:4 with Rft. Exposed surface of brick masonary shall be cement pointed 1:2. Road shall be provided with 10cm thick wearing coat of 1:2:4 cement concrete. Assume suitable rates.

Particulars of items of works	No.	length	Breadth	Height	Quantity
Earthwork in excavation in foundation		(m)	(m)	(m)	(m^3)
Abutments	2	5.1	0.7	0.6	4.28
wing walls	4	1.2	0.7	0.6	2.02
cement concrete 1:3:6 in foundation					
Abutments	2	5.1	0.7	0.3	2.14
wing walls	4	1.2	0.7	0.3	1.01
				Total	3.15m^3
I class brickwork in 1:4 cement motor					
Abutments	2	4.8	0.4	1.5	5.76
wingwalls	4	1.2	0.4	1.5	2.88

Isometric view of Slab culvert



Particulars of Item	No.	length (m)	Breadth (m)	Height (m)	Quantity (m^3)
Parapets upto kerb	2	4.7	0.4	0.3 (0.2+0.1)	1.13 $l = 4.9 - 0.1 - 0.1 = 4.7$
Parapets above kerb	2	4.7	0.3	0.5 (0.6-0.1)	1.41
Parapet coping	2	4.9	0.4	0.1	0.39
				Total	11.57.
RCC slab work 1:2:4 excluding steel including bending, shuttering and centering	1	4.8	2.1 [1.5+0.3+0.3]	0.2	2.016
steel bars including bending in R.C.C work–					
i) 20mm ϕ bars – Main straight bars 30 cm c/c, $No. = \frac{4.8}{0.3} + 1 = 17$	17	2.38			= 40.46m
			$l = 2.1 - 2\text{covers} + 2\text{hooks}$ $= 2.1 - (2 \times 0.4) + 2(9 \times 0.02)$ $= 2.38m$		
Main bentup bars 30cm c/c $No. = \frac{4.8}{0.3}$	16	2.38+0.16 = 2.54			40.64m
Adding one depth for two bentups					= 16cm
				Total	= 81.10m @ 2.4Kg/m = 200.32Kg

Item No.	Particulars of Item	No.	length
	ii) 10mm ϕ bars distribution bars 25 cm c/c		
	No. = $\frac{2.1 - 2(0.04)}{0.25}$	9	4.9
	Distributing top bars	4	4.9
			Total
			Total of S
6	cement concrete wearing coat 1:2:4	1	4
7.	cement pointing 1:2 in walls-		
	Face wall from 10 cm below GL up to bottom of coping	2	4.7
	inner side of parapet excluding coping	2	4.7