

DESIGN OF DIRT WALL AS COLUMN WITH BENDING

AXIAL LOAD ON THE DIRT WALL	31.60 KN		
ASSUME WIDTH OF DIRT WALL	1000 MM	EMIN/B	0.00
ASSUME DEPTH OF DIRT WALL	300 MM	EMIN/D	0.01
MOMENT TRANSFERRED TO DIRT WALL	12.80 KN-M		
FACTORED AXIAL LOAD	47.40 KN		
FACTORED MOMENT	19.20 KN-M		
DIA OF LONGITUDINAL REINFORCEMENT	10 MM		
CLEAR COVER	40 MM		
d'	45 MM		
d'/D	0.15		
ADOPT d'/D	0.15		
PU/FCKBD	0.01		
MU/FCKBD ²	0.01		
REINFORCEMENT EQUALLY DISTRIDUTED ON TWO SIDES			
USING CHART NO- OF RCC DESIGN AIDS	33	CONC GRADE M-30	
P/FCK	0.01		
P	0.3	> Minimum Steel 0.2% Hence OK	
AS	900 SQ MM		
TOTAL NUMBER OF BARS REQUIRED	12		
NUMBER OF BARS ON EACH SIDE	6		
SPACING	200 MM		

Alternate design Considering dirt wall as cantilever

$$\begin{aligned}
 \text{B.M.} &= 12.80 \text{ KN-M} \\
 \text{deff reqd.} &= \frac{12.80}{1000} \times \frac{10^6}{0.972} = 118.7 \text{ mm} \\
 \text{dpro} &= 300 - 50 = 250 \text{ mm} \\
 \text{Ast} &= \frac{12.80}{200} \times \frac{10^6}{0.917} = 284.87 \text{ mm}^2 \\
 \text{This steel is to be provided on back i.e. approach slab side} &
 \end{aligned}$$

mm (OK)

Provide Vertical steel as follows

On River side 10mm bars @ 150 mm c/c	=	524	mm ²
On Approach Slab side 10mm bars @ 150 Mm c/c	=	524	mm ²

Minimum steel required in Horizontal direction

$$\begin{aligned}
 &= 0.002 \times 1000 \times 250 \\
 &= 500 \text{ mm}^2 \\
 \text{i.e. 250 mm}^2 &\text{ on each face} \\
 \text{provide 10 @ 250 mm c/c} &= 314 \text{ mm}^2
 \end{aligned}$$

ABSTRACT

VERTICAL REINFORCEMENT IN SHAPE OF STIRRUPS on both faces

DIA 10 mm
SPACING 150 mm

HORIZONTAL REINFORCEMENT BAR DIA on both faces
DIA 10 mm
SPACING 250 mm