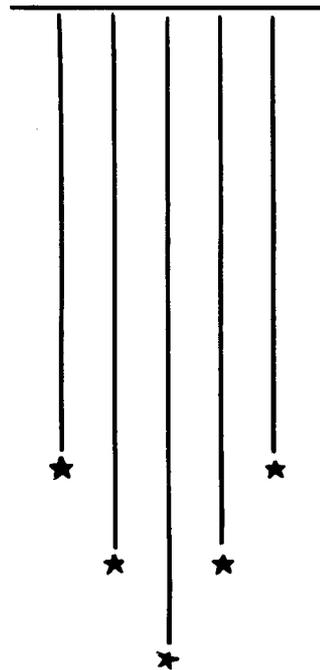


# *Planning and Designing of A Proposed Bus Stand at Tudiyalur in Coimbatore City*

P-302

## PROJECT REPORT



1997 - 98

Submitted by  
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Guided by  
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IN PARTIAL FULFILMENT OF THE REQUIREMENTS  
FOR THE AWARD OF THE DEGREE OF  
**BACHELOR OF ENGINEERING IN**  
**CIVIL ENGINEERING**  
OF THE BHARATHIAR UNIVERSITY

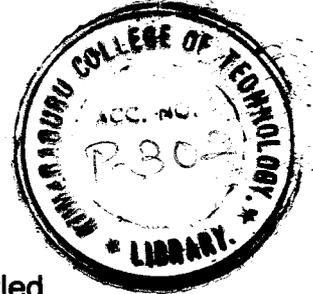
DEPARTMENT OF CIVIL ENGINEERING

# **Kumaraguru College of Technology**

COIMBATORE - 641 006.

DEPARTMENT OF CIVIL ENGINEERING  
**Kumaraguru College of Technology**

COIMBATORE – 641 006.



**CERTIFICATE**

This is to certify that the Project Report entitled  
**Planning and Designing of Proposed Bus Stand**  
at Tudiyalur in Coimbatore City.

has been submitted by

Mr. ....

In partial fulfilment for the award of the degree of

**Bachelor of Engineering**  
**in Civil Engineering**

Branch of the Bharathiar University, Coimbatore  
During the academic year 1997-98

.....  
*[Signature]*  
Guide

.....  
Head of the Department

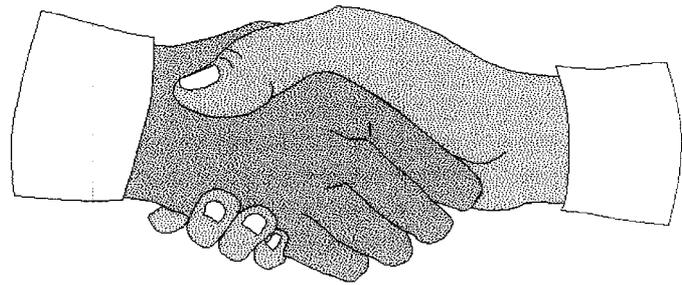
Certified that the candidate with University Register No. ....  
was examined in project work Viva-Voce by us on .....

.....  
Internal Examiner

.....  
External Examiner.



*Dedicated to our  
Beloved Nation.*



# ACKNOWLEDGEMENT

## ACKNOWLEDGEMENT

We are deeply indebted to our guide **Mr.D.Rajavel, M.E.**, for his valuable guidance and helpful suggestions, which have brought out success to the project.

We wish to express our deep sense of gratitude to **Mr.V.Govindaraj, M.E.**, for his additional and external guidance contribution in computer aided analysis and design part. We are obliged to our Head of the Department of Civil Engineering **Dr.K.Swaminathan, M.Tech., Ph.D.**, and also to our beloved Principal, **Dr.S.Subramanian B.E., M.Sc.(Engg)., Ph.D.** for his gesture evident and inspiration towards this project.

We sincerely thank **Mr.D.Prabhu, M.Arch.** (Prabhu Associates) for providing valuable sponsorship and kind suggestions.

We sincerely thank the Joint Director and other staff members of Town and Country planning and **Mr.Doraiswamy** and **Mr.Nanjappa. Jr.** Drafting officer of P.W.D., and working authorities of town planning and highways departments for their kind contribution towards this project.



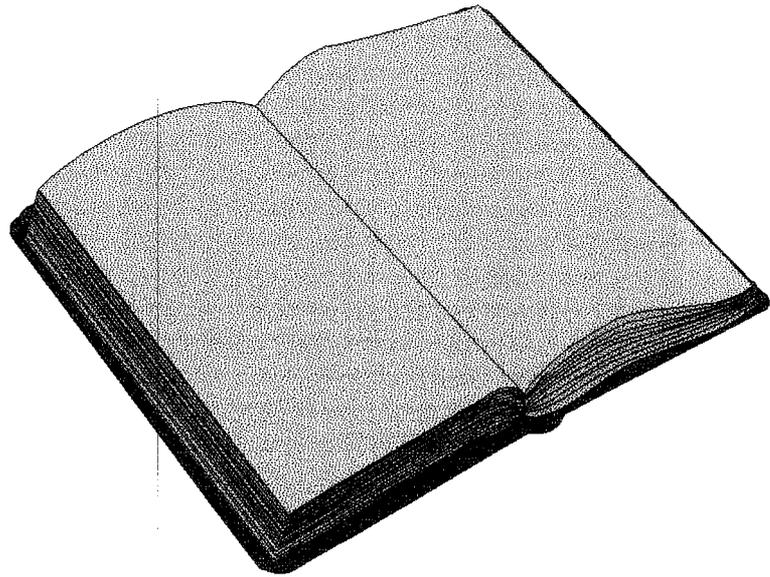
# SYNOPSIS

## **SYNOPSIS**

The development of Coimbatore City in various fields has resulted in a heavy congestion of traffic of various natures in the city. Gandhipuram, where the central bus stand is located, is one of the area in which the traffic has reached the saturation point. People face mostly congested situations due to heavy traffic in and around the existing central bus-stand at Gandhipuram and also in the roads of high importance like Mettupalayam and Sathyamangalam road.

So as a remedial measure it becomes necessary to construct a modern bus stand within the city limit. Therefore the site fulfilling all the requirements with an area of 30,000 m<sup>2</sup> (3 hectares) at Tudiyalur is being selected which is exactly 10 Kilometers from Gandhipuram Junction.

This project deals with planning, design and estimation of a Bus-stand with various facilities like shopping complex, restaurants, rest rooms, toilets, etc., at an estimated cost of Rs.2.5 Crores.



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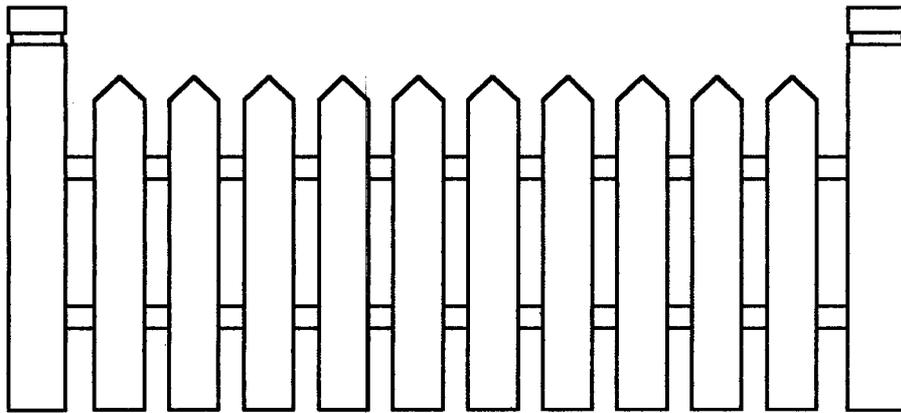
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# INTRODUCTION



# 1. INTRODUCTION

## 1.1 General:-

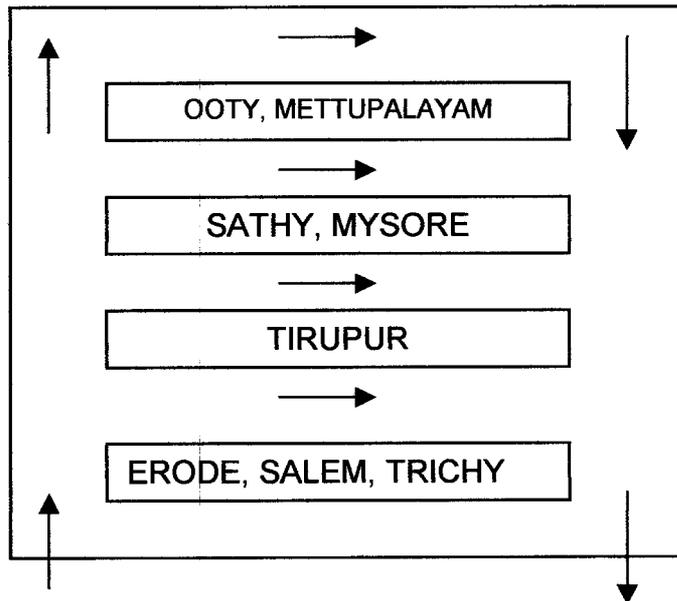
MANCHESTER OF SOUTH INDIA, COTTON CITY - the city of above said glories is Coimbatore which is third largest city in Tamil Nadu, having population of about 11 Lakhs. The population of this city grows because of its Industrial and educational development. The city is in its dynamic state of growth and it is expecting strides in Industrial Development. The city has been bringing a worthy amount of foreign exchange by its exports of Textile Machineries, Motors, Pumps, Garments, Handloom products, etc. The city has highest standard of living and plays a very significant role in developing the economy of the country and the state. It has a large amount of floating population also.

## 1.2 Need for the study:-

The phenomenal growth of industry, trade combined with heavy inflow of public as well as vehicles from other parts of the state, the Coimbatore City traffic has reached its peak. In particular the Gandhipuram zone, the nerve centre of the Cotton City, consists of two Bus-stands namely central bus-stand and city bus-stand.

Necessary comprehensive traffic and transportation study by town planning authorities has been done in collecting traffic details and the status and number of people preferring bus services as a mode for their movement from one place to another. All details regarding traffic has been shown in table 1.1..

At present the existing Bus-stand at Gandhipuram has a capacity of only 50 buses as shown below..



Due to steady increase in number of buses more number of bus bays are required. As per the survey conducted by the Town planning Department, Government of Tamilnadu. The following results were obtained regarding the requirement of bus bays in various bus stand as detailed in table number 1.2.

Table – 1.2

Sl. No.	Bus Stand Type	Location	Required No. of Bus Bays	
			1994	2004
1	Town Bus Stand	Gandhipuram	46	62
2		Ukkadam	15	20
3	Mofussil Bus Stand	Central Bus Stand	43	58
4		Ukkadam	19	26

Source: CTTS Study, Coimbatore, Department of Town Planning.

Therefore in order to reduce the traffic density in Mettupalayam road as well as Gandhipuram area the site at Tudiyalur is being proposed for a new bus-stand. comparative study of other bus-stands at Tiruppur, Mettupalayam, Salem, Erode with technical details are discussed and applied in the planning and design of this Bus-stand.

### 1.3 Objectives:-

- To relieve the congestion in the existing Mettupalayam road because of Mofussil buses.
- To develop an additional bus stand with sufficient bus bays expecting the future traffic.
- To decentralise the commercial activity at the city centre, by locating a new bus stand at Tudiyalur.

### 1.4. Site Selection Criteria:-

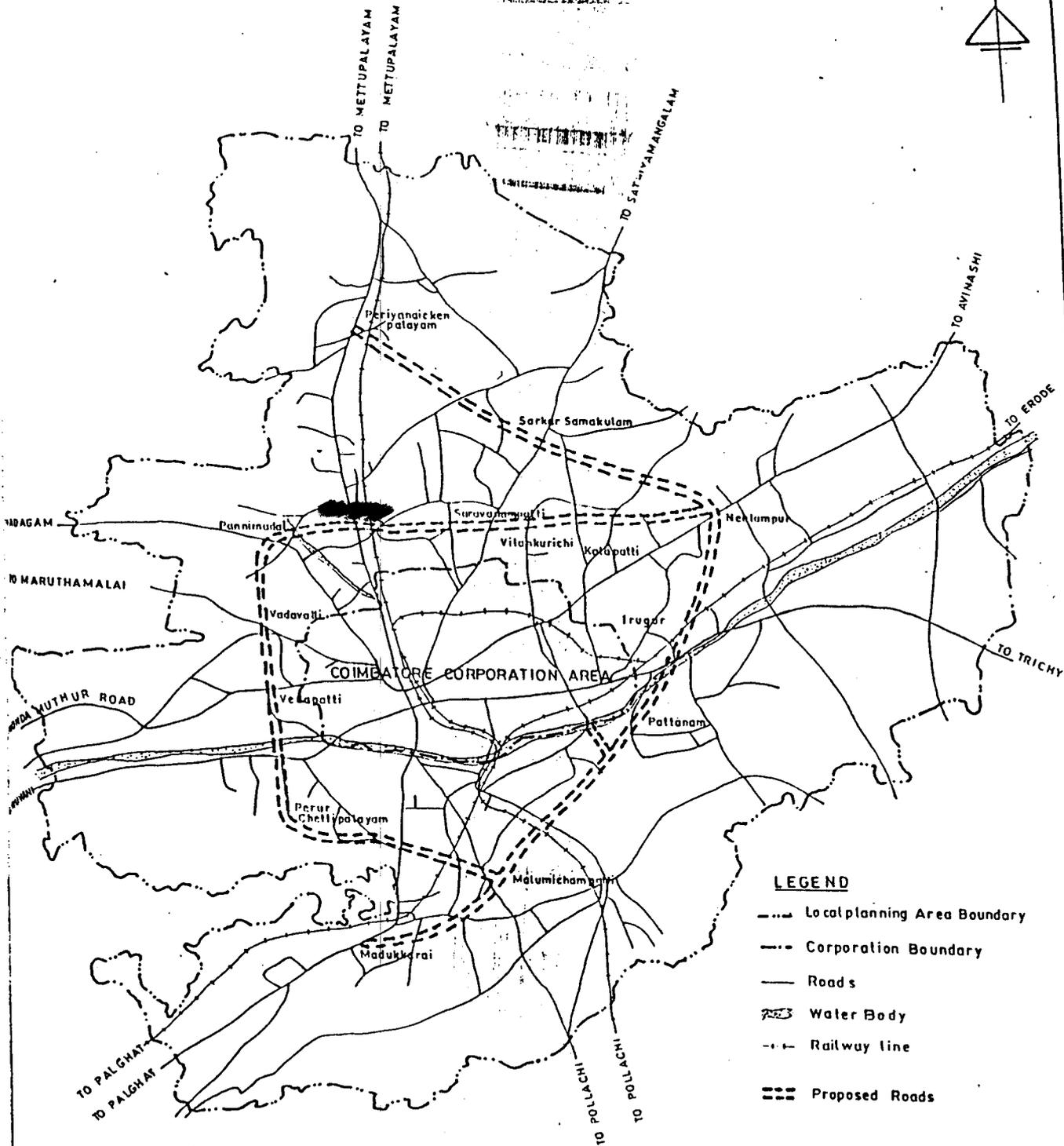
From the traffic datas available, the site for bus-stand at Tudiyalur has the following salient features:

- The proposed site is just 10 KMS from Gandhipuram junction and a existing road starting from the site connects.
- Working out the distances it points out the following details:

Sathyamangalam to Tudiyalur (58+8) = 66 KMS

Ooty to Tudiyalur = 80 KMS

Mettupalayam to Tudiyalur = 30 KMS



**LEGEND**

- Local planning Area Boundary
- - - Corporation Boundary
- Roads
- ~ Water Body
- + Railway line
- == Proposed Roads

SCALE: 0 1 2 3 4 Kms.

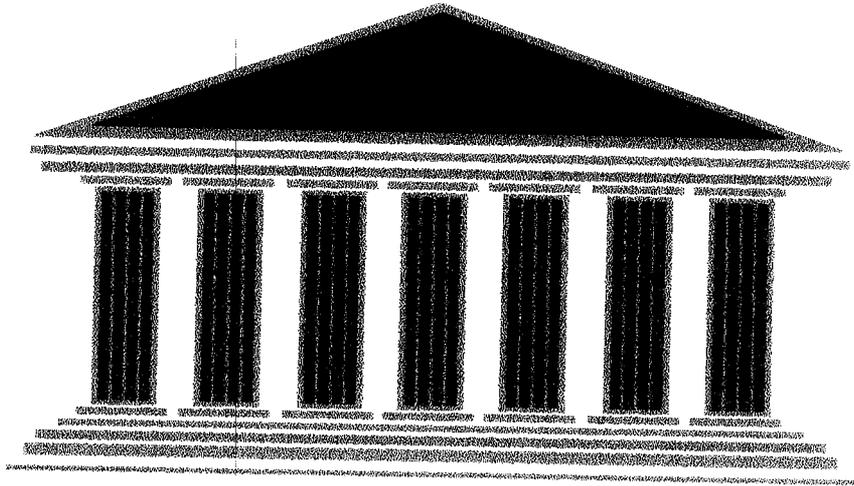
PTCS-MD

PROPOSED LINK ROADS  
 COMPREHENSIVE TRAFFIC AND TRANSPORTATION STUDY - COIMBATORE

FI

Thus a reduction in running time is noticeable with the advantage of reducing heavy traffic inside the city makes the site highly suitable for the proposal.

- Tudiyalur is the proposed city boundary in 2001.
- Tudiyalur Railway Station lies just near the proposed site.
- Another way of easy connectivity to this proposed Bus-Stand will be by the new ring road construction project around Coimbatore whose work is on execution as detailed in Fig. 1.1.
- By diverting the Sathyamangalam route buses the traffic congestion on the Sathyamangalam road at Ganapathy gets minimised to a greater extend.
- Since the site is located on the way to Ooty it improves the tourism of our state.
- The capacity of the central Bus-Stand has already exceed, the proposed bus stand will cater to the demands of route buses to Mysore, Bangalore, Mettupalayam, Sathyamangalam and Ooty.



# PLANNING

## 2. PLANNING

### 2.1 Proposed Bus Stand

The total area of the site covers about 3 hectares is located adjacent to the busiest Mettupalayam road as shown in fig. 2.1.

The facilities planned in this proposed bus stand at Tudiyalur are

1. No. of Bus bays	–	60 Nos.
2. Waiting plat form	-	6,510 m <sup>2</sup>
3. Veg. Restaurant.	-	400 m <sup>2</sup>
4. Non-veg. Restaurant.	-	309 m <sup>2</sup>
5. Shopping Complex.	-	1,200 m <sup>2</sup>
6. Town bus stand.	-	977 m <sup>2</sup>
7. Toilet – 1.	-	104 m <sup>2</sup>
8. Toilet – 2.	-	47 m <sup>2</sup>
9. Parking area.	-	5,158 m <sup>2</sup>
10. Garden.	-	2,300 m <sup>2</sup>

R.C.C. framed structure is adopted for shopping complex, which has, planned for 50 shops at Ground floor and 52 rest rooms at first floor. Town bus Zone is also planned to provide a link between the Mofussil

Fig 2.1

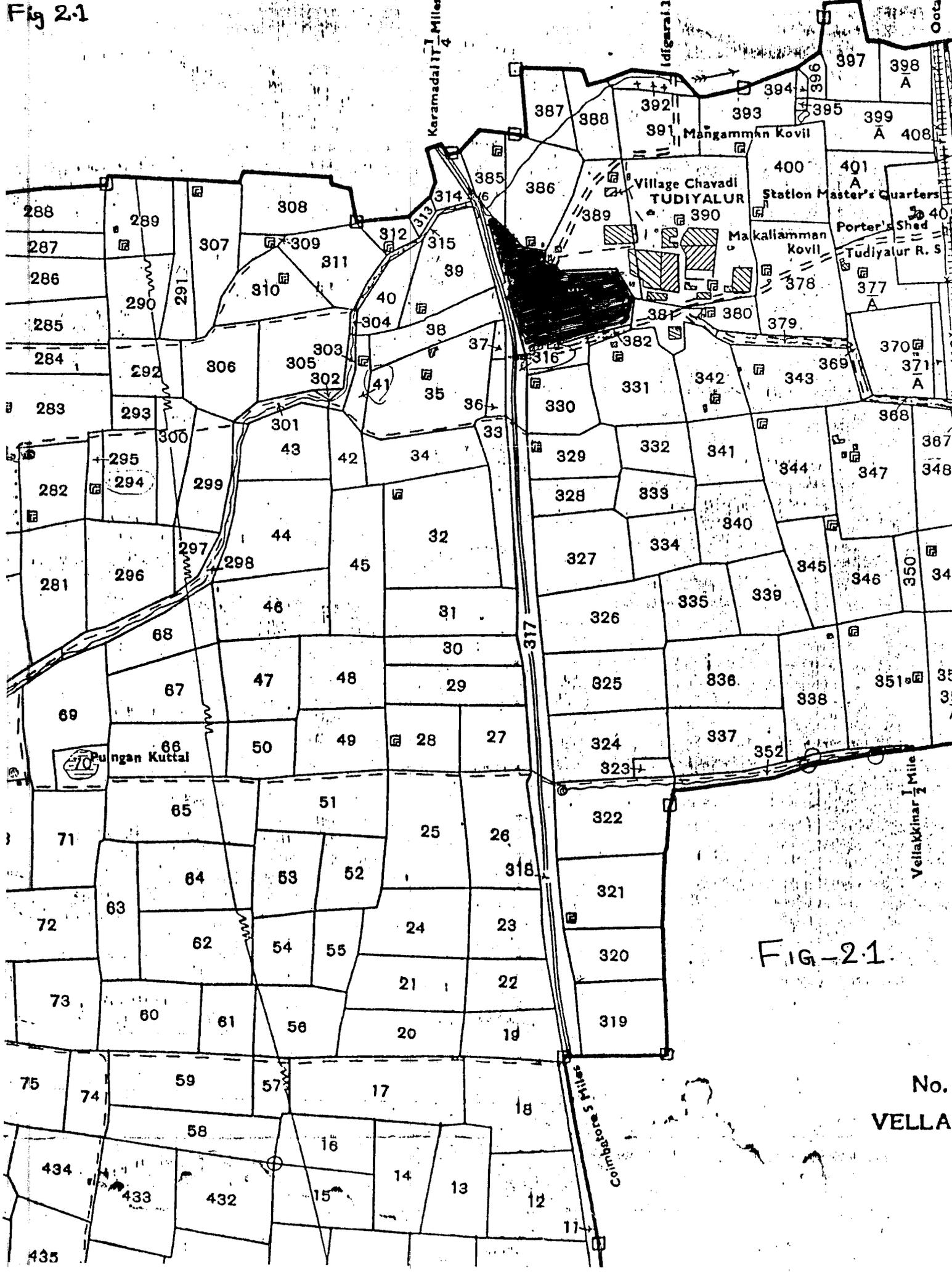


FIG-2.1

No. VELLA

buses and town buses. It has a capacity of about 15 buses. Planning of toilets is directly done and provided.

## **2.2 Road Work:-**

Necessary circulation facilities has been provided inside the proposed bus stand like service roads and approach roads. Water bound macadam (WBM) roads are provided for this purpose.

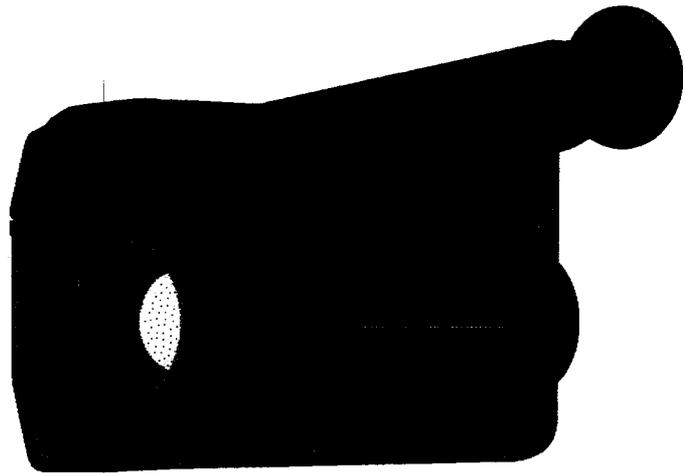
## **2.3 Parking Area:-**

Parking facilities are provided to accommodate two wheelers and four wheelers parking. The total area for parking crosses about 5,158 m<sup>2</sup>, which is more than sufficient. The surface is made up of WBM road and necessary fencing are provided.

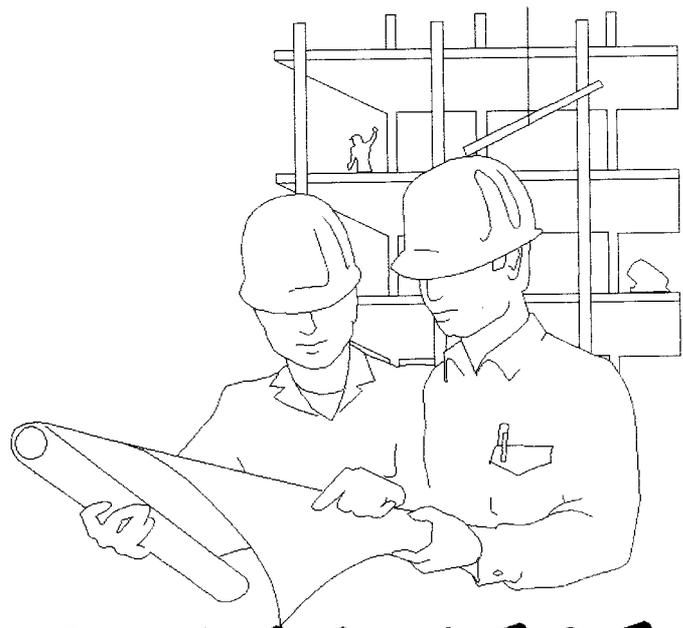
For future expansion, the first floor of Town bus stand can be utilised for Two wheeler parking as in central bus stand, Gandhipuram.

## **2.4 Garden:**

A total area of 2,300 m<sup>2</sup> is provided to develop greens like Lawns & Plants. Greens provided in the centre of Sathy Bus zone can be utilised for the future expansion. All the details are shown in the map enclosed.



PHOTOGRAPHS



# ANALYSIS AND DESIGN

## 4. ANALYSIS AND DESIGN

### 4.1 ABBREVIATIONS:

For analysis of frames, computer programs are developed in Fortran-77 by stiffness methods.

The list of abbreviations are as follows:

BM - Bending moment

P - Axial Load

PST - % Steel in tension

PSC - % Steel in compression

AST - Area of steel in tension

ASC - Area of Steel in compression

V - Shear Force.

## 4.2 DESIGN OF FRAME – 1 [Waiting Platform]

### DESIGN OF SLAB

Size of panel - 10 m x 6.5 m

$$\frac{L_x}{L_y} = \frac{10}{6.5} = 1.54 < 2$$

Two way slab.

Assume thickness of slab = 150 mm

d = 129 mm

#### Loads:

For 1 m Width,

Live load = 2 kN/m

Dead load = 0.15 (25) = 3.75 kN/m

Floor finish weight = 0.75 kN/m

Total load = 6.5 kN/m

Total designed load = 9.75 kN/m

As per IS456 – 1978, page No. 138

Case No. 2

**BM Co-efficient:**

Short span, at mid span	=	0.045
Short span, at support	=	0.06
long span, at mid span	=	0.035

**Bending Moments:**

Short span, at mid span	=	$0.045 (9.75) (6.5)^2$
	=	18.54 kNm
at support	=	$0.06 (9.75) (6.5)^2$
	=	24.72 kNm
long span, at mid span	=	$0.035 (9.75) (6.5)^2$
	=	14.41 kNm

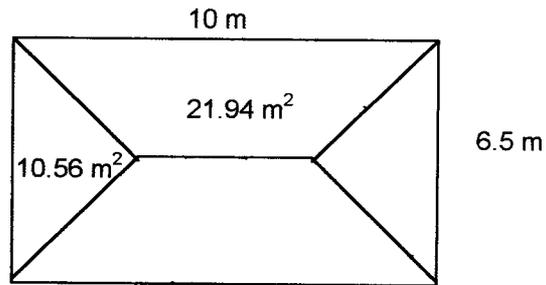
As per sp-16, page No. 61,

**Reinforcements:-**

Short span, at mid span	=	12 $\phi$ @ 250 mm c/c
At support	=	12mm $\phi$ @ 180 mm c/c
long span, at mid span	=	10 mm $\phi$ @ 230 mm c/c

Necessary Torsional reinforcement and curtailment details are to be provided.

## DESIGN OF BEAM



Size of beam = 300 x 600 mm

$W = 9.75 \text{ kN/m}^2$

Area of trapezoidal =  $2 (21.94) = 43.88 \text{ m}^2$

### Loads:

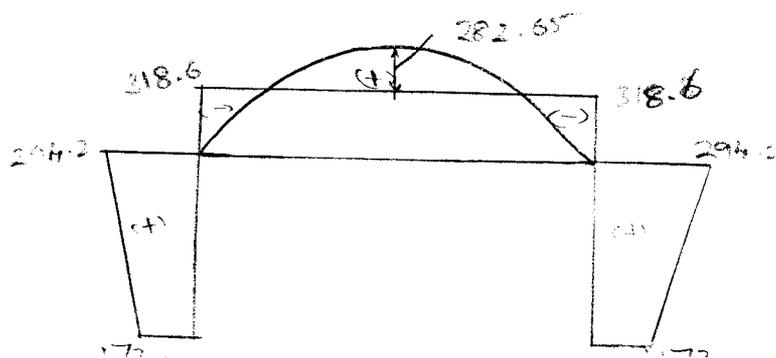
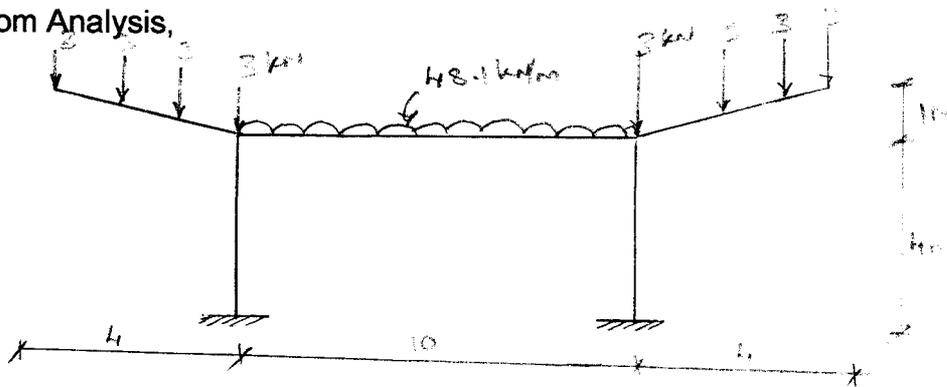
Load from slab/m run =  $\frac{43.88 (9.75)}{10}$

= 42.7 kN/m

Designed self weight =  $0.3 (0.45) (25) (1.5) = 5.4 \text{ kN/m}$

Total designed load = 48.1 kN/m

From Analysis,



At support,

$$\text{BM} = 318.6 \text{ kNm}$$

$$\frac{M}{bd^2} = 3.33 \text{ N/mm}^2$$

From sp-16, page no. 85

$$\text{PST} = 1.045\%$$

$$\text{PSC} = 0.395\%$$

Area of steel

$$\text{AST} = \frac{1.095}{100} (300) (565) = 1856.02 \text{ mm}^2$$

$$\text{ASC} = \frac{0.0345}{100} (300) (565) = 669.5 \text{ mm}^2$$

Reinforcement

At Bottom, 4-25 mm $\phi$

At top, 1-25 mm $\phi$  + 1-16 mm $\phi$

Shear reinforcement – 8 mm $\phi$  @ 140 mm c/c

## DESIGN OF COLUMN

$$\text{SIZE OF COLUMN} = 450 \text{ mm} \times 450 \text{ mm}$$

$$P = 520.47 \text{ KN}$$

$$\text{BM} = 294.2 \text{ KNM}$$

From page No. 130, SP-16

$$\text{PST} = 2.7\%$$

$$\text{AST} = \frac{2.7}{100} (450) (450) = 5467.5 \text{ mm}^2 \text{ [25mm}\phi\text{--12 Nos.]}$$

Provides 8 mm $\phi$  c/c as lateral ties.

25 mm $\phi$  – 12 Nos. as main bars.

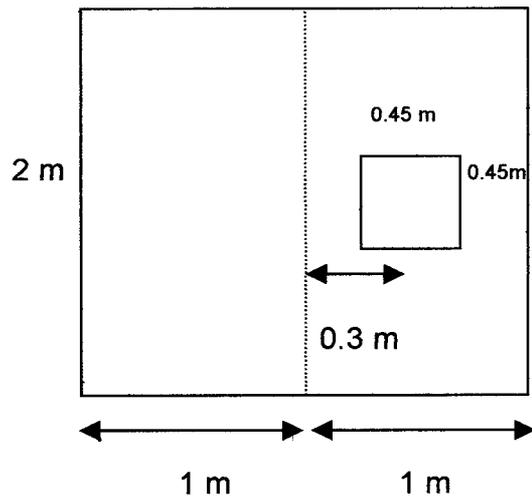
## DESIGN OF FOUNDATION

$$P = 572 \text{ kN}$$

$$\text{BM} = 172.4 \text{ kNm}$$

$$e = \frac{172.4}{572} = 0.3 \text{ m}$$

$$\begin{aligned} \text{Size of the foundation} &= \frac{572}{150} \\ &= 2 \text{ m} \times 2 \text{ m} \end{aligned}$$



$$\text{Net upward pressure} = \frac{520}{4} = 130 \text{ kN/m}^2$$

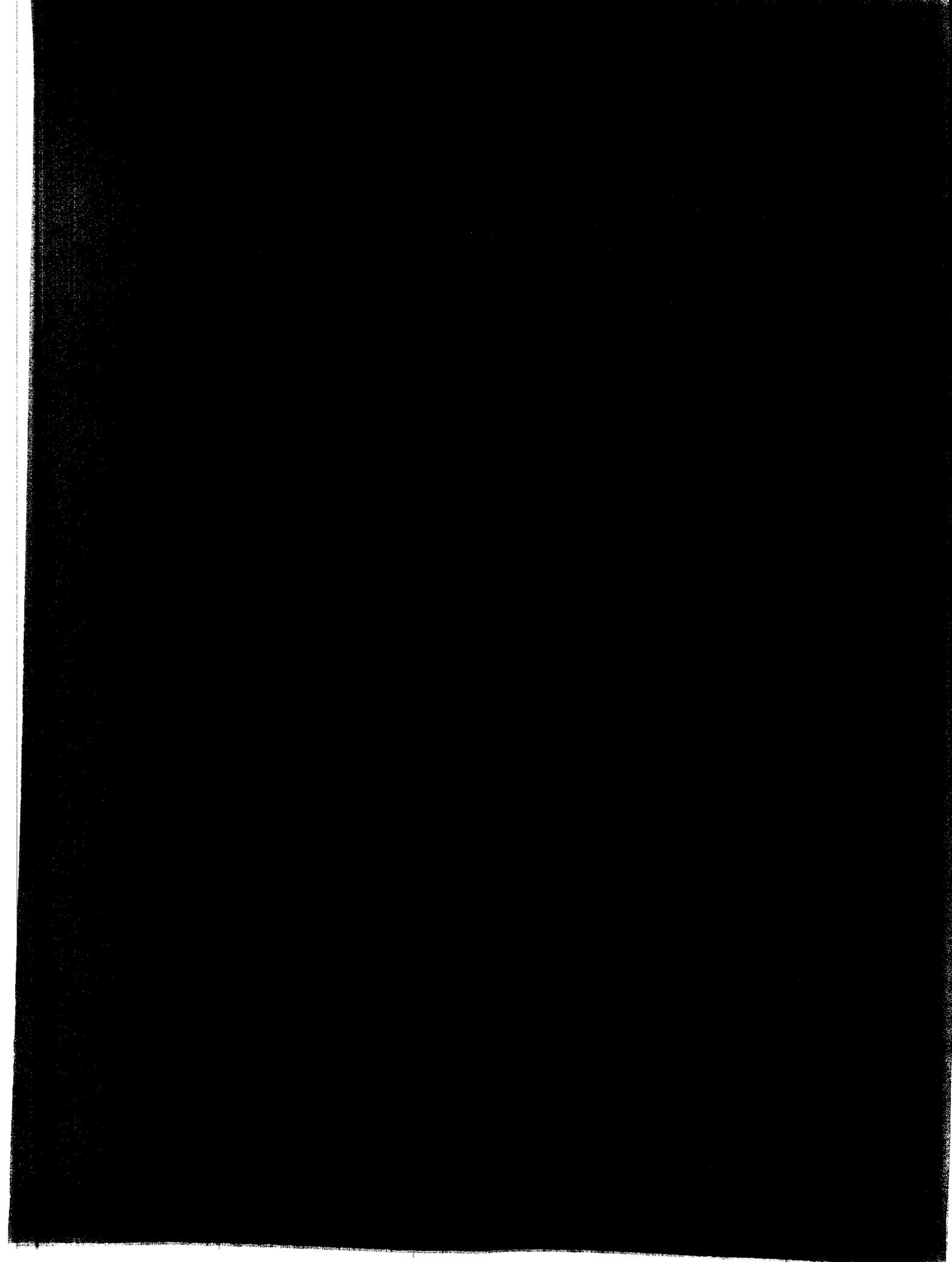
$$\text{Max. BM} = 130 (2) \frac{(1.075)^2}{2}$$

$$= 150.4 \text{ kNm}$$

$$d = \sqrt{\frac{150.4 \times 10^6}{2000(2.07)}}$$

$$= 190.6 \approx 230$$

$$D = 300 \text{ mm}$$



```

C      STIFFNESS METHOD
C      DEVELOPED BY V.GOVINDARAJ
      DIMENSION X(200),Y(200),S(200,200),AML(150,6),
1     F(200),IP(150),IQ(150)
      DIMENSION A(100),AI(100),U(200),BK(6,6),P(150),D(200)
      OPEN(1,FILE='VGRAJ.IN')
      OPEN(2,FILE='VGRAJ.OUT')
      READ(1,*)NN,NE,NBC,E
      WRITE(2,*)'PRIMARY DATA'
      WRITE(2,*)'NN NE NBC E',NN,NE,NBC,E
      WRITE(2,*)'JOINT COORDINATES'
      DO 10 I=1,NN
      READ(1,*)J,X(J),Y(J)
      WRITE(2,413)J,X(J),Y(J)
10     CONTINUE
413    FORMAT(/,9X,I2,20X,F12.2,14X,F12.2)
      WRITE(2,*)'MEMBER INFORMATIONS'
      DO 15 I=1,NE
      READ(1,*)J,IP(J),IQ(J),A(J),AI(J)
      WRITE(2,415)J,IP(J),IQ(J),A(J),AI(J)
15     CONTINUE
415    FORMAT(5X,I2,15X,I2,10X,I2,10X,F12.2,5X,F12.2)
      N=NN*3
      DO 20 I=1,N
20     F(I)=0.0
      DO 24 I=1,NE
      DO 24 J=1,6
24     AML(I,J)=0.0
      READ(1,*)NJL
      WRITE(2,*)'NUMBER OF JOINT LOADS =',NJL
      IF(NJL.EQ.0)GOTO 12
      DO 25 I=1,NJL
      READ(1,*)LJN
      N1=LJN*3-2
      N2=N1+1
      N3=N2+1
25     READ(1,*)F(N1),F(N2),F(N3)
12     READ(1,*)NML
      WRITE(2,*)'NML=',NML
      IF(NML.EQ.0)GOTO 34
      DO 30 I=1,NML
      READ(1,*)J,(AML(J,MN)),MN=1,6)
      WRITE(2,*)'MEMBER LOAD DETAILS'
30     WRITE(2,*)J,(AML(J,MN)),MN=1,6)
34     DO 35 I=1,N
      DO 35 J=1,N
35     S(I,J)=0.0
C      GENERATION OF STIFFNESS MATRIX
      DO 40 M=1,NE
      NB=IP(M)
      NF=IQ(M)
      H=X(NF)-X(NB)
      V=Y(NF)-Y(NB)
      AL=SQRT(H*H+V*V)
      CA=H/AL
      SA=V/AL
      C2=CA**2
      S2=SA**2

```

```

CS=CA*SA
T1=E*A(M)/AL
T2=12.0*E*AI(M)/AL**3
T3=4.0*E*AI(M)/AL
T4=6.0*E*AI(M)/AL**2
IB=3*NB-2
IF=3*NF
344 FORMAT(3X,I2,5X,I2,9X,I2,5X,F10.5,5X,F13.4,10X,F10.5,/)
S(IB,IB)=S(IB,IB)+(C2*T1+S2*T2)
S(IB,IB+1)=S(IB,IB+1)+CS*T1-CS*T2
S(IB,IB+2)=S(IB,IB+2)+SA*T4
S(IB,IF-2)=S(IB,IF-2)-C2*T1-S2*T2
S(IB,IF-1)=S(IB,IF-1)-CS*T1+CS*T2
S(IB,IF)=S(IB,IF)+SA*T4
S(IB+1,IB+1)=S(IB+1,IB+1)+S2*T1+C2*T2
S(IB+1,IB+2)=S(IB+1,IB+2)-CA*T4
S(IB+1,IF-2)=S(IB+1,IF-2)-CS*T1+CS*T2
S(IB+1,IF-1)=S(IB+1,IF-1)-S2*T1-C2*T2
S(IB+1,IF)=S(IB+1,IF)-CA*T4
S(IB+2,IB+2)=S(IB+2,IB+2)+T3
S(IB+2,IF-2)=S(IB+2,IF-2)-SA*T4
S(IB+2,IF-1)=S(IB+2,IF-1)+CA*T4
S(IB+2,IF)=S(IB+2,IF)+0.5*T3
S(IF-2,IF-2)=S(IF-2,IF-2)+C2*T1+S2*T2
S(IF-2,IF-1)=S(IF-2,IF-1)+CS*T1-CS*T2
S(IF-2,IF)=S(IF-2,IF)-SA*T4
S(IF-1,IF-1)=S(IF-1,IF-1)+S2*T1+C2*T2
S(IF-1,IF)=S(IF-1,IF)+CA*T4
S(IF,IF)=S(IF,IF)+T3
S(IB+1,IB)=S(IB,IB+1)
S(IB+2,IB)=S(IB,IB+2)
S(IF-2,IB)=S(IB,IF-2)
S(IF-1,IB)=S(IB,IF-1)
S(IF,IB)=S(IB,IF)
S(IB+2,IB+1)=S(IB+1,IB+2)
S(IF-2,IB+1)=S(IB+1,IF-2)
S(IF-1,IB+1)=S(IB+1,IF-1)
S(IF,IB+1)=S(IB+1,IF)
S(IF-2,IB+2)=S(IB+2,IF-2)
S(IF-1,IB+2)=S(IB+2,IF-1)
S(IF,IB+2)=S(IB+2,IF)
S(IF-1,IF-2)=S(IF-2,IF-1)
S(IF,IF-2)=S(IF-2,IF)
S(IF,IF-1)=S(IF-1,IF)
F(IB)=F(IB)+(CA*AML(M,1)-SA*AML(M,2))
F(IB+1)=F(IB+1)+CA*AML(M,2)+SA*AML(M,1)
F(IB+2)=F(IB+2)+AML(M,3)
F(IF-2)=F(IF-2)+CA*AML(M,4)-SA*AML(M,5)
F(IF-1)=F(IF-1)+SA*AML(M,4)+CA*AML(M,5)
F(IF)=F(IF)+AML(M,6)
40 CONTINUE
C APPLICATION OF BOUNDARY CONDITIONS
WRITE(2,*)'BOUNDARY CONDITION DETAILS'
DO 60 I=1,NBC
READ(1,*)JB,SB

```

```

WRITE(2,*)JB,SB
S(JB,JB)=1.0
F(JB)=SB
DO 70 J=1,N
IF(J.EQ.JB)GOTO 65
S(JB,J)=0.0
S(J,JB)=0.0
65 CONTINUE
70 CONTINUE
60 CONTINUE
CALL GAUSS(S,F,U,N)
WRITE(2,209)
209 FORMAT(\\,8X,'DEFLECTIONS ARE',\\)
DO 208 NI=1,NN
208 WRITE(2,210)NI,U(NI*3-2),U(NI*3-1),U(NI*3)
210 FORMAT(//,I3,5X,3(5X,E13.4),//)
WRITE(2,234)
234 FORMAT(//,2X,'MEMBER FORCES IN LOCAL COORDINATE SYSTEM ',//)
WRITE(2,2378)
2378 FORMAT(1X,'MEMBER',1X,'NODE',7X,'AXIALFORCE',7X,'SHEARFORCE',
1 7X,'BENDINGMOMENT',//)
C CALCULATION OF MEMBER END FORCES
DO 100 I=1,NE
NB=IP(I)
NF=IQ(I)
H=X(NF)-X(NB)
V=Y(NF)-Y(NB)
AL=SQRT(H*H+V*V)
CA=H/AL
SA=V/AL
C2=CA*CA
S2=SA*SA
CS=CA*SA
T1=E*A(I)/AL
T2=12.0*E*AI(I)/AL**3
T3=4.0*E*AI(I)/AL
T4=6.0*E*AI(I)/AL**2
BK(1,1)=T1
BK(2,1)=0.0
BK(3,1)=0.0
BK(4,1)=-T1
BK(5,1)=0.0
BK(6,1)=0.0
BK(1,2)=0.0
BK(2,2)=T2
BK(3,2)=-T4
BK(4,2)=0.0
BK(5,2)=-T2
BK(6,2)=-T4
BK(1,3)=0.0
BK(2,3)=-T4
BK(3,3)=T3
BK(4,3)=0.0
BK(5,3)=T4
BK(6,3)=0.5*T3
DO 110 II=1,6
BK(II,4)=-BK(II,1)
BK(II,5)=-BK(II,2)
110 BK(II,6)=BK(II,3)
BK(3,6)=0.5*T3
BK(6,6)=T3
TR=3*NR-2

```

```

D(1)=CA*U(IB)+SA*U(IB+1)
D(2)=CA*U(IB+1)-SA*U(IB)
D(3)=U(IB+2)
D(4)=CA*U(IF-2)+SA*U(IF-1)
D(5)=-SA*U(IF-2)+CA*U(IF-1)
D(6)=U(IF)
DO 120 L=1,6
P(L)=0.0
DO 120 J=1,6
120 P(L)=P(L)+BK(L,J)*D(J)
DO 130 L=1,6
130 P(L)=P(L)-AML(I,L)
WRITE(2,206)I,NB,P(1),P(2),P(3)
WRITE(2,207)NF,P(4),P(5),P(6)
207 FORMAT(8X,I3,3(7X,E13.6),/)
206 FORMAT(1X,I3,4X,I3,3(7X,E13.6),/)
100 CONTINUE
STOP
END

```

```

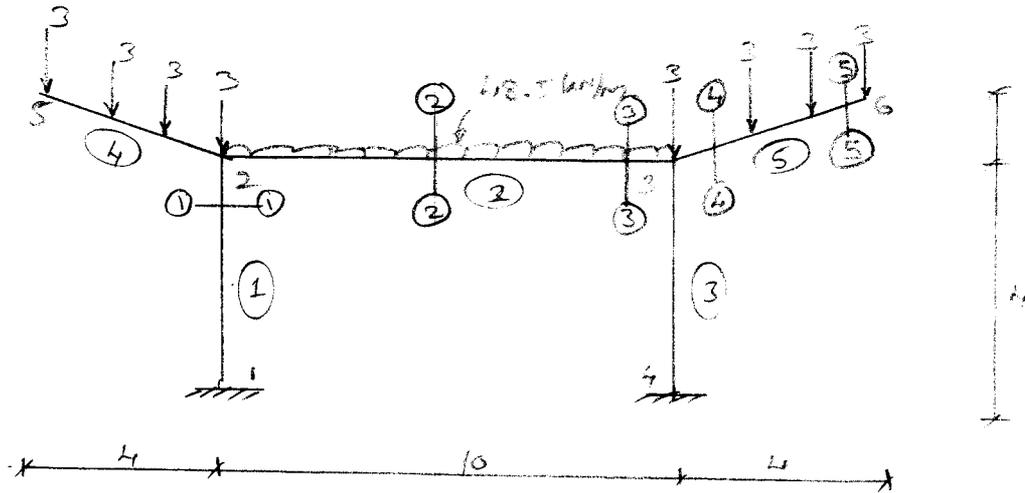
C      GAUSSIAN ELIMINATION
      SUBROUTINE GAUSS(A,C,X,N)
      DIMENSION A(200,200),C(200),X(200)
      DO 10 I=1,N-1
      DO 10 J=I+1,N
      D=A(J,I)/A(I,I)
      DO 30 K=1,N
      30 A(J,K)=A(J,K)-A(I,K)*D
      C(J)=C(J)-C(I)*D
      10 CONTINUE
      DO 40 I=N,1,-1
      TOT=0.0
      DO 50 J=I+1,N
      50 TOT=TOT+A(I,J)*X(J)
      X(I)=(C(I)-TOT)/A(I,I)
      TOT=0
      40 CONTINUE
      RETURN
      END

```

## 4.2 FRAME NO.1 [Waiting Platform]

### SLAB DETAILS

TK = 150 mm; Size = 10m x 6.5 m ; W = 9.75 KN/m<sup>2</sup>



①, ②, ③, ④, ⑤ - SECTIONS

1, 2, 3, 4, 5, 6 - NODES

①, ②, ③, ④, ⑤ - MEMBERS

	Short Span		Long Span
	Support	Midspan	Midspan
BM - co-eff.	0.06	0.045	0.035
BM (KNM)	24.72	18.54	14.42
Reinforcement	12 $\phi$ - 180 c/c	12 $\phi$ - 250 c/c	10 $\phi$ - 230 c/c

PRIMARY DATA

NN NE NBC E                    6                    5                    6                    0.2200000E+008

JOINT COORDINATES

1	4.00	0.00
2	4.00	4.00
3	14.00	4.00
4	14.00	0.00
5	0.00	5.00
6	18.00	5.00

MEMBER INFORMATIONS

1	1	2	0.20	0.0
2	2	3	0.18	0.0
3	3	4	0.20	0.0
4	5	2	0.14	0.0
5	3	6	0.14	0.0

NUMBER OF JOINT LOADS =

NMJ:                    3                    4

MEMBER LOAD DETAILS

2	0.0000000	-247.6500000	-247.6500000
412.7500000	0.0000000		
-412.7500000			

MEMBER LOAD DETAILS

4	0.0000000	-3.0000000	-3.0000000
2.7400000	0.0000000		
-2.7400000			

MEMBER LOAD DETAILS

5	0.0000000	-3.0000000	-3.0000000
2.7400000	0.0000000		
-2.7400000			

BOUNDARY CONDITION DETAILS

1	0.0000000
2	0.0000000
3	0.0000000
10	0.0000000
11	0.0000000
12	0.0000000

DEFLECTIONS ARE

1	0.0000E+00	0.0000E+00	0.0000E+00
2	0.1369E-03	-0.2330E-03	0.3962E-02
3	-0.1369E-03	-0.2330E-03	-0.3962E-02
4	0.0000E+00	0.0000E+00	0.0000E+00
5	0.3865E-02	0.1468E-01	0.3634E-02
6	-0.3865E-02	0.1468E-01	-0.3634E-02

MEMBER FORCES IN LOCAL COORDINATE SYSTEM

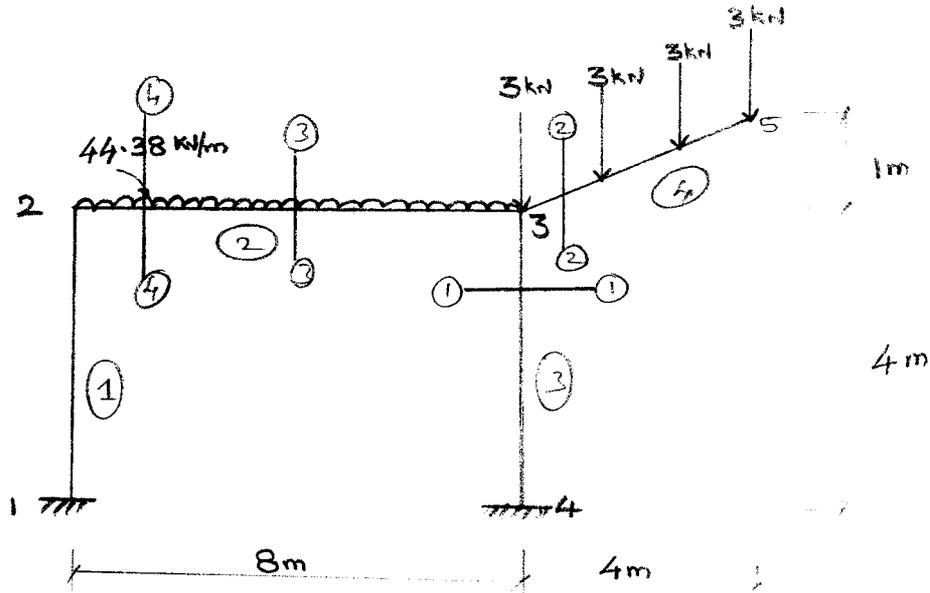
MEMBER	NODE	AXIALFORCE	SHEARFORCE	BENDINGMOMENT
1	1	0.259471E+03	-0.109858E+03	0.145190E+03
	2	-0.259471E+03	0.109858E+03	0.294242E+03
2	2	0.108403E+03	0.247650E+03	-0.318612E+03
	3	-0.108403E+03	0.247650E+03	0.318612E+03
3	3	0.259471E+03	0.109858E+03	-0.294242E+03
	4	-0.259471E+03	-0.109858E+03	-0.145190E+03
4	5	0.727570E+00	-0.291031E-01	-0.101328E-03
	2	-0.727570E+00	0.891031E+01	0.243692E+02
5	3	0.727432E+00	0.891042E+01	-0.243694E+02
	6	-0.727432E+00	-0.291042E+01	0.101328E-03

Section	Size (mm)	BM (KNm) P (KN)	% of Steel (%)	AST (mm <sup>2</sup> )	Reinfor cement	Shear Reinforcement
1-1	450 x 450	BM = 294.2 P = 259.47	2.7	5467.5	12- 25 $\phi$	Lateral Ties – 8 $\phi$ - 380 c/c
2.2	300 x 600	BM=301.12	PST=1.049 PSC= 0.347	AST=1778.05 ASC= 588.17	4-25 $\phi$ 2-20 $\phi$	V=247.68 KN 8 $\phi$ - 140 c/c
3-3	300 x 600	BM = 318.6	PST= 1.095 PSC= 0.395	AST= 1856.02 ASC= 669.5	4-25 $\phi$ 2-20 $\phi$ + 1-8 $\phi$	V=247.68 KN 8 $\phi$ - 140 c/c
4-4	300 x 450	BM = 58.12	0.343	427	4-12 $\phi$	8 $\phi$ - 300 c/c
5-5	300 x 300	-	-	-	2-12 $\phi$	8 $\phi$ - 300 c/c
Cross beam	300 x 450	BM = 73.67	0.45	560.25	3- 16 $\phi$	6 $\phi$ - 170c/c
Founda tion	2000 x 2000 D = 300 mm	BM = 172 P = 572	0.45	2070.82	11-16 $\phi$	Distributors 10 $\phi$ - 210c/c

### 4.3 FRAME NO.2 [Waiting Platform]

#### SLAB DETAILS

TK = 150 mm; Size = 8m x 6.5 m ; W = 9.75 KN/m<sup>2</sup>



①, ②, ③, ④ - SECTIONS

1, 2, 3, 4, 5 - NODES

①, ②, ③, ④ - MEMBERS

	Short Span		Long Span
	Support	Midspan	Midspan
BM - co-eff.	0.041	0.053	0.035
BM <sub>(KNM)</sub>	16.89	21.63	14.42
Reinforcement	12 $\phi$ - 275 c/c	12 $\phi$ -200 c/c	12 $\phi$ -300 c/c

PRIMARY DATA

NN NE NBC E                    5                    4                    6                    0.2200000E+008

JOINT COORDINATES

1		0.00	0.00
2		0.00	4.00
3		8.00	4.00
4		8.00	0.00
5		12.00	5.00

MEMBER INFORMATIONS

1	1	2	0.20	0.0
2	2	3	0.18	0.0
3	3	4	0.20	0.0
4	3	5	0.14	0.0

NUMBER OF JOINT LOADS = 2

NML= 2

MEMBER LOAD DETAILS

2	0.0000000	-177.5200000	
236.6900000	0.0000000		-177.5200000
-236.6900000			

MEMBER LOAD DETAILS

4	0.0000000	-3.0000000	
2.7400000	0.0000000		-3.0000000
-2.7400000			

BOUNDARY CONDITION DETAILS

1	0.0000000
2	0.0000000
3	0.0000000
10	0.0000000
11	0.0000000
12	0.0000000

DEFLECTIONS ARE

1	0.0000E+00	0.0000E+00	0.0000E+00
2	0.3674E-03	-0.1569E-03	0.2283E-02
3	0.2478E-03	-0.1725E-03	-0.2600E-02
4	0.0000E+00	0.0000E+00	0.0000E+00
5	-0.1546E-02	0.7000E-02	-0.1700E-02

## MEMBER FORCES IN LOCAL COORDINATE SYSTEM

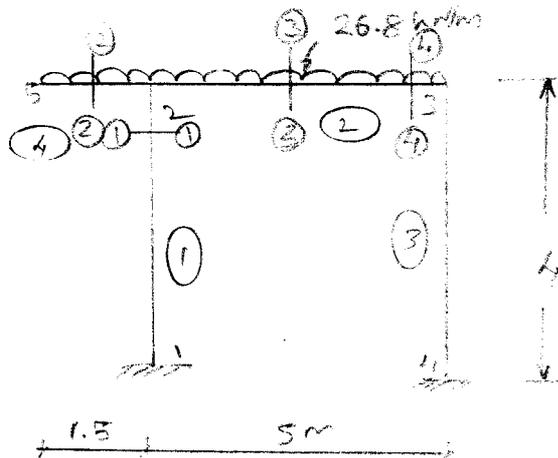
MEMBER	NODE	AXIALFORCE	SHEARFORCE	BENDINGMOMENT
1	1	0.174712E+03	-0.592444E+02	0.755367E+02
	2	-0.174712E+03	0.592444E+02	0.161441E+03
2	2	0.592444E+02	0.174712E-03	-0.161441E+03
	3	-0.592444E+02	0.180328E+03	0.183905E+03
3	3	0.192149E+03	0.606996E+02	-0.159535E+03
	4	-0.192149E+03	-0.606996E+02	-0.832630E+02
4	3	0.727676E+00	0.891037E+01	-0.243692E+02
	5	-0.727676E+00	-0.291037E+01	0.555515E+04

Section	Size (mm)	BM (KNm) P (KN)	% of Steel (%)	AST (mm <sup>2</sup> )	Reinfor cement	Shear Reinforcement
1-1	450 x 450	BM = 159.5 P = 192.1	1.2	2430	4- 25φ 4-12φ	Lateral Ties – 8φ - 380 c/c
2.2	300 x 450	BM=58.12	0.343	427	4-12φ	8φ - 300 c/c
3-3	300 x 600	BM = 193.4	0.693	1174.63	4-20φ	8φ-200c/c
4-4	300 x 600	BM = 161	0.55	932	3-20φ	8φ - 200 c/c
Cross beam	450x300	BM = 73.67	0.45	560.25	3- 16φ	6φ - 170c/c
Founda tion	2000 x 2000 D = 300 mm	BM = 83.26 P = 552	0.306	1407.6	13-12φ	Distributors 10φ - 210c/c

#### 4.4 FRAME NO.3 [Town Bus-Stand]

##### SLAB DETAILS

TK = 120 mm; Size = 4m x 5m ; W = 9.75 KN/m<sup>2</sup>



①, ②, ③, ④ - SECTIONS

1, 2, 3, 4, 5 - NODES

①, ②, ③, ④ - MEMBERS

	Short Span		Long Span	
	Support	Midspan	Support	Midspan
BM - co-eff.	0.0495	0.0375	0.037	0.028
BM <sub>(KNM)</sub>	11.13	8.44	8.33	6.3
Reinforcement	10φ - 230 c/c	8φ-200 c/c	8φ-200 c/c	8φ-270 c/c

PRIMARY DATA

NN NE NBC E

5

4

6

0.2200000E+008

JOINT COORDINATES

1	1.50	0.00
2	1.50	4.00
3	6.50	4.00
4	6.50	0.00
5	0.00	4.00

MEMBER INFORMATIONS

1	1	2	0.00	0.00
2	2	3	0.14	0.14
3	3	4	0.00	0.00
4	2	5	0.14	0.14

NUMBER OF JOINT LOADS =

0

NML= 2

MEMBER LOAD DETAILS

2	0.0000000	-67.0000000
55.7800000	0.0000000	-67.0000000
-35.7800000		

MEMBER LOAD DETAILS

4	0.0000000	-20.0800000
5.0200000	0.0000000	-20.0800000
-5.0200000		

BOUNDARY CONDITION DETAILS

1	0.0000000
2	0.0000000
3	0.0000000
10	0.0000000
11	0.0000000
12	0.0000000

DEFLECTIONS ARE

1	0.0000E+00	0.0000E+00	0.0000E+00
2	0.5200E-03	-0.4282E-04	0.2286E-02
3	0.5010E-03	-0.1468E-03	-0.1770E-02
4	0.0000E+00	0.0000E+00	0.0000E+00
5	0.5200E-03	0.3724E-02	0.2300E-02

MEMBER FORCES IN LOCAL COORDINATE SYSTEM

MEMBER	NODE	AXIALFORCE	SHEARFORCE	BEND MOMENT
1	1	0.211950E+02	-0.112810E-02	0.140761E-01
	2	-0.211950E+02	0.112810E-02	0.310478E+02
2	2	0.112809E-02	0.613550E-02	-0.927544E-01
	3	-0.112809E-02	0.726450E-02	0.291524E-02
3	3	0.726450E+02	0.112809E-02	-0.291524E-02
	4	-0.726450E+02	-0.112809E-02	-0.159713E-02
4	2	0.000000E+00	0.401600E+02	-0.301202E-01
	5	0.000000E+00	-0.171661E-04	0.102520E-03

Section	Size (mm)	BM (KNm) P (KN)	% of Steel (%)	AST (mm <sup>2</sup> )	Reinfor cement	Shear Reinforcement
1-1	300 x 300	BM = 31.04 P = 121.2	0.8	720	4- 16φ	Lateral Ties – 6φ - 250 c/c
2.2	300 x 300	BM=30.1	0.453	360.1	2-16φ	6φ-170 c/c
3-3	300 x 375	BM = 31.04	0.27	275.4	2-12φ 1-8φ	6φ-300 c/c
4-4	300 x 375	BM = 53.67	0.5	510	3-16φ	6φ - 300 c/c
Cross beam	300 x 300	BM = 45.7	0.746	593.01	3- 16φ	6φ - 200c/c
Founda tion	1500 x 1500 D = 300 mm	BM = 45.7 P = 300	0.12	414	6-10φ	Distributors 10φ - 210c/c

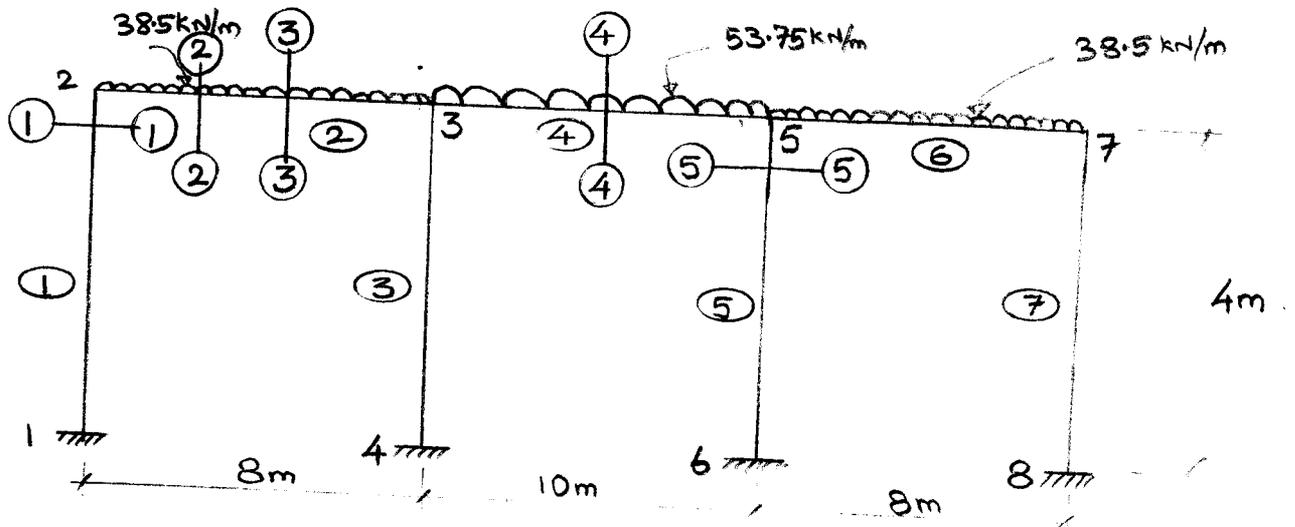
#### 4.5 FRAME NO.4 [Veg. Restaurant]

##### SLAB DETAILS

$S_1 = \text{size} - 10 \text{ m} \times 5 \text{ m} ; D = 150 \text{ mm} ; W = 9.75 \text{ KN/m}^2$

$M = 30.47 \text{ KNm} ; A_{st} = 12\phi - 130 \text{ c/c} ; \text{Distributors} - 6\phi - 150 \text{ c/c}.$

$S_2 = \text{Size} - 8 \text{ m} \times 5 \text{ m} ; D = 150 \text{ mm} ; W = 9.75 \text{ KN/m}^2$



1, 2, 3 ... - NODES

①, ②, ③ ... - SECTIONS

①, ②, ③ ... - MEMBERS

	Short Span		Long Span	
	Support	Midspan	Support	Midspan
BM - co-eff.	0.079	0.059	0.047	0.035
BM <sub>(KNM)</sub>	19.25	14.38	11.46	8.5
Reinforcement	10 $\phi$ - 170 c/c	10 $\phi$ -230 c/c	8 $\phi$ -190 c/c	8 $\phi$ -250 c/c

PRIMARY DATA

NN NE NBC E  
JOINT COORDINATES

8

7

12

0.2200000E+000

1	0.00	0.00
2	0.00	4.00
3	8.00	0.00
4	8.00	0.00
5	18.00	4.00
6	18.00	0.00
7	26.00	4.00
8	26.00	0.00

MEMBER INFORMATIONS

1	1	2	0.18	0.0
2	2	3	0.18	0.0
3	3	4	0.18	0.0
4	3	5	0.18	0.0
5	5	6	0.18	0.0
6	5	7	0.18	0.0
7	7	8	0.18	0.0

NUMBER OF JOINT LOADS = 0

NML= 3

MEMBER LOAD DETAILS

2	0.0000000	-154.0000000	-154.0000000
205.3000000	0.0000000		
-205.3000000			

MEMBER LOAD DETAILS

4	0.0000000	-268.7500000	-268.7500000
447.9000000	0.0000000		
-447.9000000			

MEMBER LOAD DETAILS

6	0.0000000	-154.0000000	-154.0000000
205.3000000	0.0000000		
-205.3000000			

BOUNDARY CONDITION DETAILS

1	0.0000000
2	0.0000000
3	0.0000000
10	0.0000000
11	0.0000000
12	0.0000000
16	0.0000000
17	0.0000000
18	0.0000000
22	0.0000000
23	0.0000000
24	0.0000000

DEFLECTIONS ARE

1	0.0000E+00	0.0000E-00	0.0000E+00
2	0.1575E-03	-0.1128E-03	0.1297E-02
3	0.8860E-04	-0.4050E-03	0.1323E-02
4	0.0000E+00	0.0000E+00	0.0000E+00
5	-0.8861E-04	-0.4050E-03	-0.1323E-02
6	0.0000E+00	0.0000E-00	0.0000E+00
7	-0.1575E-03	-0.1128E-03	-0.1297E-02
8	0.0000E+00	0.0000E-00	0.0000E+00

MEMBER FORCES IN LOCAL COORDINATE SYSTEM

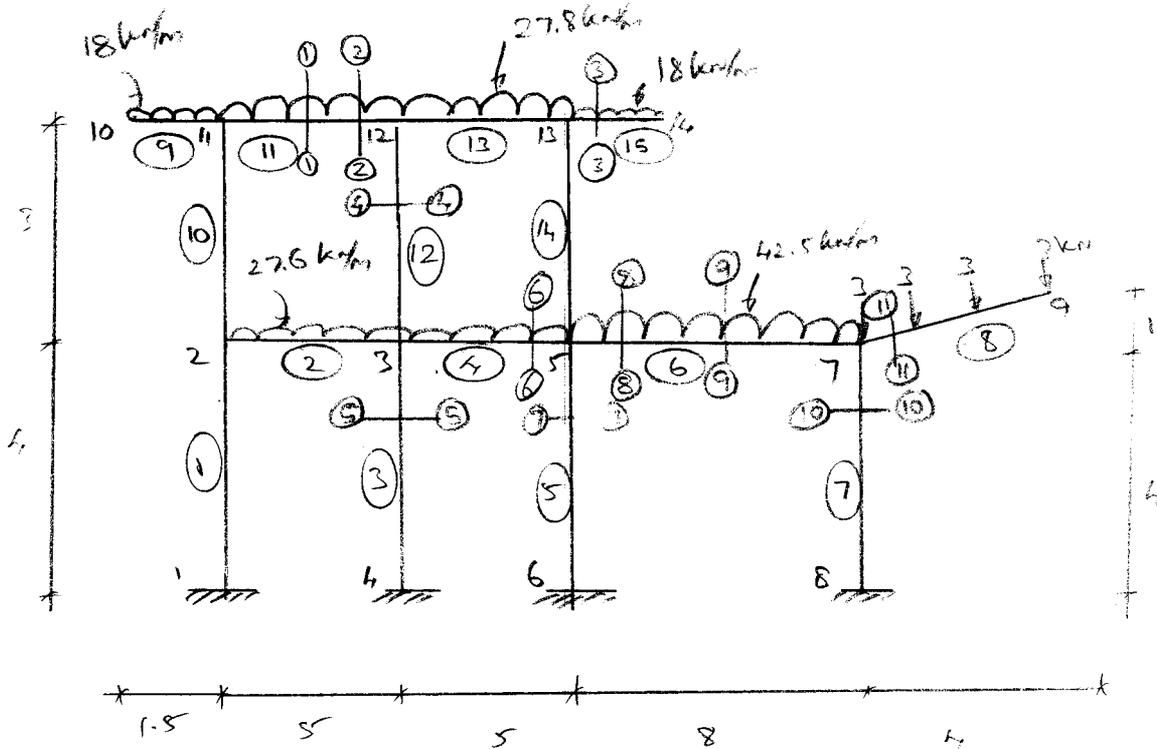
MEMBER	NODE	AXIALFORCE	SHEARFORCE	BENDINGMOMENT
1	1	0.125638E-03	-0.340913E-02	0.439740E-02
	2	-0.125638E-03	0.340913E-02	0.923912E-02
2	2	0.340913E-02	0.125638E-03	-0.923912E-02
	3	-0.340913E-02	0.182362E-03	0.319288E-03
3	3	0.451112E+03	-0.360839E-02	0.970569E-02
	4	-0.451112E+03	0.360839E-02	0.472785E-02
4	3	0.701751E-02	0.268750E-03	-0.416345E-03
	5	-0.701751E-02	0.268750E-03	0.416345E-03
5	5	0.451112E+03	0.360839E+02	-0.970570E-02
	6	-0.451112E+03	-0.360839E+02	0.472785E-02
6	5	0.340913E-02	0.182362E-03	-0.319288E-03
	7	-0.340913E-02	0.125638E-03	0.923912E-02
7	7	0.125638E+03	0.340913E-02	-0.923912E-02
	8	-0.125638E+03	-0.340913E+02	0.439740E-02

Section	Size (mm)	BM (KNm) P (KN)	% of Steel (%)	AST (mm <sup>2</sup> )	Reinforcement	Shear Reinforcement
1-1	450 x 300	BM = 95.4 P = 125.63	0.9	1215	4- 20 $\phi$	Lateral Ties – 6 $\phi$ - 280 c/c
2.2	300 x 600	BM=100.63	0.32	542.14	3-16 $\phi$	8 $\phi$ -250 c/c
3-3	300 x 600	BM = 319.3	PST=1.1 PSC=0.4	AST=1864.5 ASC=678	6-20 $\phi$ 2-20 $\phi$	8 $\phi$ -250 c/c
4-4	300 x 600	BM = 255.575	PST=0.9 PSC=0.19	AST=1525.5 ASC=322	5-20 $\phi$ 1-20 $\phi$	8 $\phi$ - 200 c/c
5-5	450 x 300	BM=99.59 P=451.1	1.2	1620	4-20 $\phi$ 4-12 $\phi$	6 $\phi$ -280c/c
Cross beam	300 x 300	BM = 39.95	0.64	508.8	3- 16 $\phi$	6 $\phi$ - 170c/c
Founda tion	2350 x 1500 D = 300 mm	BM = 47.2 P = 524.07	0.35	1217.85	11-12 $\phi$	Distributors 10 $\phi$ - 210c/c

## 4.6 FRAME NO.5 [Shopping Complex]

### SLAB DETAILS

Size - 5 m x 6.5 m; D = 150 mm; W = 9.75 KN/m<sup>2</sup>



①, ②, ③, ④ ... - SECTIONS

1, 2, 3, 4 ... - NODES

①, ②, ③, ④ ... - MEMBERS

	Short Span		Long Span	
	Support	Midspan	Support	Midspan
BM - co-eff.	0.057	0.044	0.037	0.028
BM <sub>(KNM)</sub>	13.9	10.72	9.02	6.8
Reinforcement	10φ - 240 c/c	10φ-300 c/c	8φ-250 c/c	8φ-270 c/c

PRIMARY DATA

NX NE NBC E

14

15

12

9.2200000E 000

JOINT COORDINATES

1		1.50	0.00
2		1.50	4.00
3		6.50	4.00
4		6.50	0.00
5		11.50	4.00
6		11.50	0.00
7		19.50	4.00
8		19.50	0.00
9		23.50	0.00
10		0.00	7.00
11		1.50	7.00
12		6.50	7.00
13		11.50	7.00
14		13.00	7.00

MEMBER INFORMATIONS

1	1	2	0.09	0.00
2	2	3	0.09	0.00
3	3	4	0.09	0.00
4	3	5	0.09	0.00
5	5	6	0.09	0.00
6	5	7	0.18	0.00
7	7	8	0.09	0.00
8	7	9	0.14	0.00
9	10	11	0.09	0.00
10	2	11	0.09	0.00
11	11	12	0.09	0.00
12	3	12	0.09	0.00
13	12	13	0.09	0.00
14	5	13	0.09	0.00
15	13	14	0.09	0.00

NUMBER OF JOINT LOADS =

2

NMI= 8

MEMBER LOAD DETAILS

2	0.0000000	-69.5000000	-69.5000000
57.8750000	0.0000000		
-57.8750000			

MEMBER LOAD DETAILS

4	0.0000000	-69.5000000	-69.5000000
57.8750000	0.0000000		
-57.8750000			

MEMBER LOAD DETAILS

6	0.0000000	-170.2400000	-170.2400000
226.9900000	0.0000000		
-226.9900000			

MEMBER LOAD DETAILS

8

2.7400000  
-2.7400000

0.0000000

0.0000000

-3.0000000

-3.0000000

MEMBER LOAD DETAILS

9

3.3750000  
-3.3750000

0.0000000

0.0000000

-13.5000000

-13.5000000

MEMBER LOAD DETAILS

11

57.8750000  
-57.8750000

0.0000000

0.0000000

-69.5000000

-69.5000000

MEMBER LOAD DETAILS

13

57.8750000  
-57.8750000

0.0000000

0.0000000

-69.5000000

-69.5000000

MEMBER LOAD DETAILS

15

3.3750000  
-3.3750000

0.0000000

0.0000000

-13.5000000

-13.5000000

BOUNDARY CONDITION DETAILS

- 1
- 2
- 3
- 10
- 11
- 12
- 16
- 17
- 18
- 22
- 23
- 24

0.0000000  
0.0000000  
0.0000000  
0.0000000  
0.0000000  
0.0000000  
0.0000000  
0.0000000  
0.0000000  
0.0000000  
0.0000000  
0.0000000

DEFLECTIONS ARE

1	0.0000E+00	0.0000E+00	0.0000E+00
2	-0.3837E-04	-0.3106E-03	0.1045E-02
3	-0.1944E-04	-0.5702E-03	-0.9000E-04
4	0.0000E+00	0.0000E+00	0.0000E+00
5	-0.1754E-04	-0.3076E-03	0.1100E-02
6	0.0000E+00	0.0000E+00	0.0000E+00
7	-0.1180E-03	-0.1601E-03	-0.1870E-02
8	0.0000E+00	0.0000E+00	0.0000E+00
9	-0.1437E-02	0.5112E-02	-0.1000E-02
10	0.1531E-02	0.6171E-03	0.5442E-03
11	0.1531E-02	-0.4549E-03	0.1000E-02
12	0.1490E-02	-0.7979E-03	0.0702E-02
13	0.1473E-02	-0.4493E-03	-0.0000E+00
14	0.1473E-02	0.7340E-03	-0.0212E-02

MEMBER FORCES IN LOCAL COORDINATE SYSTEM

MEMBER	NODE	AXIALFORCE	SHEARFORCE	BENDINGMOMENT
1	1	0.156709E-03	-0.759595E-01	0.101992E-02
	2	-0.156709E-03	0.759595E-01	0.201847E-02
2	2	-0.749527E-01	0.654296E-02	-0.434098E-02
	3	0.749527E-01	0.735794E-02	0.607627E-02
3	3	0.284708E-03	0.490019E-00	-0.136670E-02
	4	-0.284708E-03	-0.490019E-00	-0.629271E-02
4	3	-0.751176E-00	0.641177E-02	-0.401766E-02
	5	0.751176E-00	0.748823E-02	0.760081E-02
5	5	0.342542E-03	-0.426396E-02	0.113571E-02
	6	-0.342542E-03	0.426396E-02	0.570170E-02
6	5	0.497340E-02	0.173959E-03	-0.191737E-03
	7	-0.497340E+02	0.166521E-03	0.161984E-03
7	7	0.178342E-03	0.511892E-02	-0.137014E-03
	8	-0.178342E+03	-0.511892E-02	-0.671423E-02
8	7	0.727608E+03	0.891039E-01	-0.243092E-02
	9	-0.727608E+00	-0.291039E-01	0.977516E-02
9	10	0.000000E+00	0.000000E-00	0.000000E-00
	11	0.000000E+00	0.270000E-02	0.202300E-02
10	2	0.912790E+02	-0.150912E-02	0.232052E-02
	11	-0.912790E-02	0.150912E-02	0.236485E-02
11	11	0.150904E-02	0.642790E-02	-0.423775E-01
	12	-0.150904E+02	0.747210E-02	0.684005E-02
12	3	0.147020E-03	0.724311E+01	-0.132183E-02
	12	-0.147020E-03	-0.724311E+01	-0.351103E-01
13	12	0.784662E+01	0.722994E-02	-0.598924E-02
	13	-0.784662E+01	0.667006E+02	0.458955E-02
14	5	0.937006E-02	0.784556E+01	0.210070E-01
	13	-0.937006E-02	-0.784556E-01	-0.236454E-02
15	13	0.000000E+00	0.270000E-02	-0.202300E-02
	14	0.000000E-00	-0.372205E-02	-0.381470E-02

Section	Size (mm)	BM (KNm) P (KN)	% of Steel (%)	AST (mm <sup>2</sup> )	Reinfor cement	Shear Reinforcement
1-1	300 x 300	BM = 33.9	0.518	411.81	2- 12φ	8φ - 240 c/c
2.2	300 x 300	BM=72.57	PST=1.17 PSC=0.48	AST=930.15 ASC=381.6	3-20φ 4-12φ	8φ-240 c/c
3-3	300 x 300	BM = 20.27	0.29	229.7	2-12φ	8φ-300 c/c
4-4	300 x 600	BM = 304	0.87	771.9	4-16φ	6φ - 250 c/c Lateral ties
5-5	300 x 300	P=450	1.47	1323.8	4-20φ	8φ-380c/c
6-6	300 x 300	BM=102.4	PST=1.6 PSC=0.96	1276.77 760.02	4-20φ 2-20φ 1-12φ	8φ-380 c/c
7-7	450 x 450	P=500 BM=102	0.8	1620	6-20φ	8φ-200c/c
8-8	300 x 600	BM=210.4	0.754	1278.04	2-20φ	8φ-200c/c
9-9	300 x 600	BM=159.68	0.542	918.69	3-20φ	8φ-200c/c
10-10	450 x 450	P=174.8 BM=127.9	0.9	1822.5	4-25φ	8φ-380c/c
11-11	450 x 300	BM=58.12	0.343	427	4-12φ	8φ-300c/c
Cross beam	450 x 300	BM=152.46	PST=0.985 PSC=0.276	AST=1229.4 ASC=382.85	4-20φ 1-20φ	6φ - 170c/c
Founda tion	1750 x 1750 D = 300 mm	P = 450	0.2	746.45	11-10φ	Distributors 10φ - 210c/c

PRIMARY DATA

NN NE NBC E

JOINT COORDINATES

JOINT	4	3	5	0.2200000E+000
1		0.00		0.00
2		0.00		4.00
3		10.00		4.00
4		10.00		0.00

MEMBER INFORMATIONS

1	1
2	2
3	3

NUMBER OF JOINT LOADS =

NM:

3

JOINT

0.00  
0.18  
0.00

MEMBER LOAD DETAILS

2

434.3750000  
-434.3750000

0.0000000

0.0000000

-260.6250000

-260.6250000

BOUNDARY CONDITION DETAILS

1	0.0000000
2	0.0000000
3	0.0000000
10	0.0000000
11	0.0000000
12	0.0000000

DEFLECTIONS ARE

1	0.0000E+00	0.0000E+00	0.0000E+00
2	0.1386E-03	-0.3510E-03	0.5905E-02
3	-0.1386E-03	-0.3510E-03	-0.5905E-02
4	0.0000E+00	0.0000E+00	0.0000E+00

MEMBER FORCES IN LOCAL COORDINATE SYSTEM

MEMBER NODE

AXIALFORCE

SHEARFORCE

BENDINGMOMENT

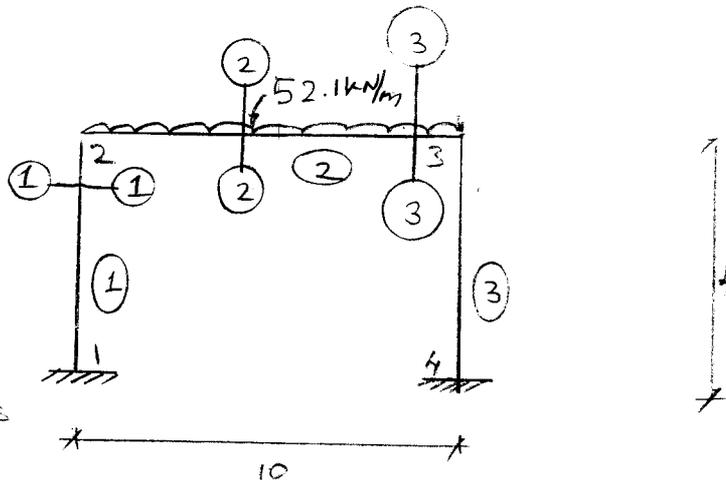
1	1	0.260625E+03	-0.109761E-03	0.145479E+02
	2	-0.260625E+03	0.109761E-03	0.293564E+03
2	2	0.109761E+03	-0.260625E-03	-0.293564E+03
	3	-0.109761E-03	0.260625E+03	0.293564E+03
3	3	0.260625E+03	-0.109761E-03	-0.293564E+03
	4	-0.260625E-03	-0.109761E-03	-0.145479E+02

## 4.7 FRAME NO.6 [Non-Veg. Restaurant]

### SLAB DETAILS

Size – 10 m x 5 m ; D = 150 mm ; W = 9.75 KN/m<sup>2</sup>

BM = 30.48 KNm; RFT = 12 $\phi$  - 130 c/c; Distributors - 6 $\phi$  - 150 c/c.

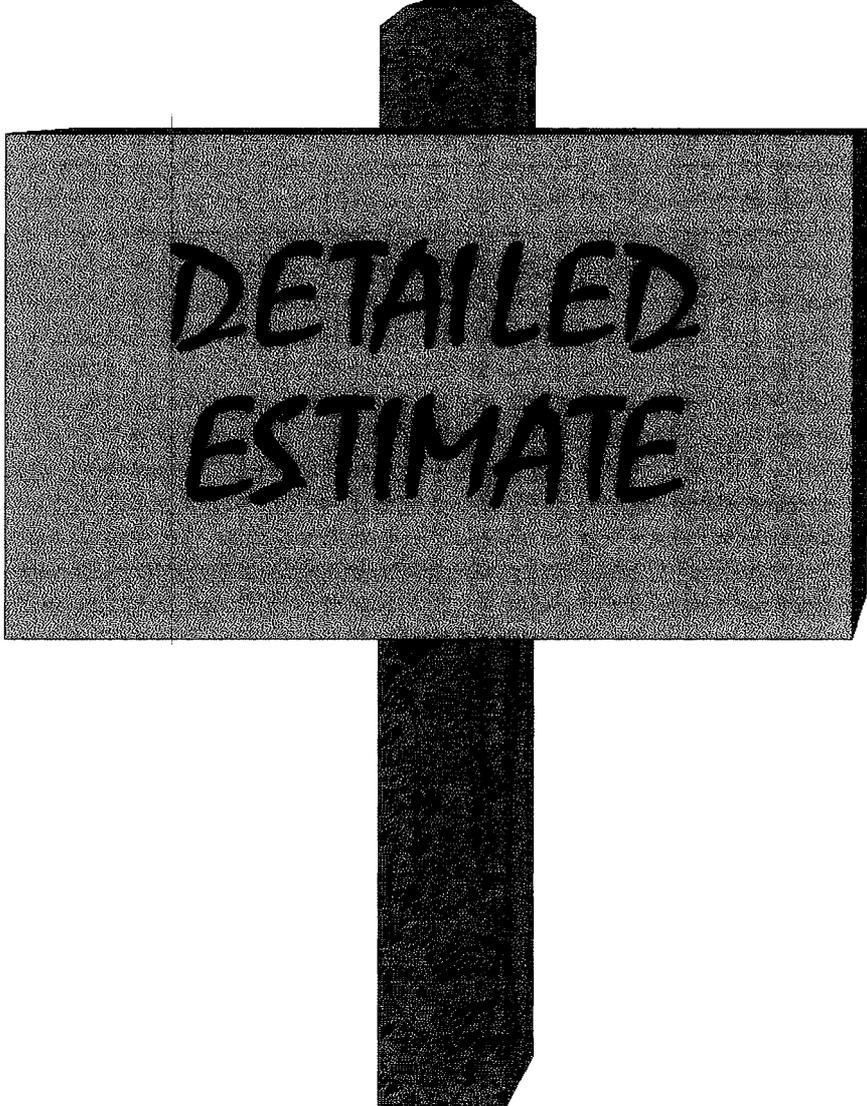


① ② ③ - SECTIONS

1, 2, 3, 4 - NODES

① ② ③ - MEMBERS

Section	Size (mm)	BM (KNm) P (KN)	% of Steel (%)	AST (mm <sup>2</sup> )	Reinfor cement	Shear Reinforcement
1-1	525 x 300	BM=300.86 P = 260.86	3	4725	8- 25 $\phi$ 4-16 $\phi$	Lateral Ties – 6 $\phi$ - 250 c/c
2-2	300 x 600	BM=306.7	PST=1.064 PSC=0.36	1803.48 615.28	6-20 $\phi$ 2-20 $\phi$	8 $\phi$ -130 c/c
3-3	300 x 600	BM=344.68	PST=1.19 PSC=0.5	2013.66 833.94	7-20 $\phi$ 3-20 $\phi$	8 $\phi$ -130 c/c
Cross beam	300 x 300	BM = 41.05	0.66	526.4	4- 16 $\phi$	6 $\phi$ - 170c/c
Founda tion	2350 x 1500 D = 300 mm	BM=145.07 P = 524.07	0.64	2208	11-16 $\phi$	10 $\phi$ - 210c/c



DETAILED  
ESTIMATE

## 5. DETAILED ESTIMATE

### 5.1 DETAILED ESTIMATE FOR WAITING PLATFORM

S.No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
1.	Earth work Excavation	140	2.0	2.0	1.8	1008.0m <sup>3</sup>
2.	P.C.C. 1:4:8 for mat concrete	140	2.0	2.0	0.15	84.0m <sup>3</sup>
3.	R.C.C. 1:2:4 for footing	140	2.0	2.0	0.3	168.0 m <sup>3</sup>
4.	R.C.C. 1:2:4 for column	140	0.45	0.45	5	141.75m <sup>3</sup>
5.	R.C.C. 1:2:4 for plinth beam:					
	6.5m span	153	6.5	0.3	0.3	89.505
	8m span	58	8	0.3	0.3	41.76
	10m span	15	10	0.3	0.3	13.5
						144.76 m <sup>3</sup>
6.	Brick work in CM 1:4, Incl. Both side plastering:- Above plinth. --As same as 5 -	-	-	-	-	144.76
	wall between parking & plat form	1	60	0.23	3.7	51.06
	bays	60	18	0.23	0.3	74.52
	others	1	150	0.23	0.3	10.35
						280.69 m <sup>3</sup>

S.No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
7.	R.C.C. 1:2:4 for Beam					
	-- 6.5 m span —	153	6.5	0.3	0.45	134.26
	-- 8 m span --	58	8	0.3	0.45	62.64
	-- 10 m span –	15	10	0.3	0.45	20.25
	cantilever beam	70	4.11	0.3	0.375	32.47
						<u>249.62 m<sup>3</sup></u>
8.	R.C.C. 1:2:4 for slab	53	8	6.5	0.15	413.4
		15	10	6.5	0.15	146.25
		9	6.5	6.5	0.15	57.04
						<u>616.69 m<sup>3</sup></u>
9.	Weathering course in lime mortar with pressed tiles at top -- as same as 8 --					
	616.64					
	----- = 4111.25					
	0.15	--	--	--	--	4111.25
	less for verandah					-136.5
						<u>3974.75 m<sup>2</sup></u>

S.No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
10.	Plastering in cm1:4,12mm					
	Tk	140	1.8	--	4	1008
	Columns	--	--	--	--	4111.25
	Ceiling (as same as 9)					
	Beam sides	58	8	--	0.9	417.6
	(i)	15	10	--	0.9	135
	(ii)	153	6.5	--	0.6	596.7
	(iii)	70	4.11	--	1.35	388.4
	Cantilever beam					6656.9 m <sup>2</sup>
11.	White washing, 2 coats					
	-- as same as 10 --	--	--	--	--	6656.9 m <sup>2</sup>
12.	P.C.C. 1:4:8 for flooring					
	concrete					
	(i)	53	9	6.5	0.15	465.05
	(ii)	15	12	6.5	0.15	175.5
	(iii)	10	6.5	6.5	0.15	63.375
	Bays	60	16.9	--	0.15	152.55
	Others	--	-800	--	0.15	120.0
						976.5 m <sup>3</sup>

S.No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
13.	Granolithic floor finish, cm 1:3, 20 mm Tk -- as same as 12 --	976.5 ----- = 6510 0.15				6510 m <sup>2</sup>
14.	A.C. sheet roofing, incl. Fitting & angles Bus Bays 1-14	1	100	4.11	--	411
	15-26	1	90	4.11	--	369.9
	27-35	1	72	4.11	--	295.92
	36-46	1	90	4.11	--	369.9
	47-54	1	68	4.11	--	279.48
	55-60	1	50	4.11	--	205.5
						1931.7 m <sup>2</sup>
15.	Sand Filling in basement -- as same as 12 --	976.5 ----- (0.3) = 1953 m <sup>3</sup> 0.15				1953 m <sup>3</sup>

**5.2 DETAILED ESTIMATE FOR VEG. RESTAURANT:-**

Sl. No	Description of work	No	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
1.	Earth work Excavation	16	2.35	1.5	1.8	101.52 m <sup>3</sup>
2.	P.C.C. 1:4:8 for mat concrete	16	2.35	1.5	0.15	8.46 m <sup>3</sup>
3.	R.C.C. 1:2:4 for footing	16	2.35	1.5	0.3	16.92 m <sup>3</sup>
4.	R.C.C. 1:2:4 for column	16	0.45	0.3	5.6	12.1 m <sup>3</sup>
5.	R.C.C. 1:2:4 for plinth beam					
	-- around --	1	82	0.3	0.3	7.38
	cross wall	2	14.7	0.3	0.3	2.65
						<hr/> 10.03 m <sup>3</sup> <hr/>
6.	Brick work in cm 1:4 Incl. Both side plastering around	1	82	0.23	4.3	81.1
	cross wall	1	14.77	0.23	4.3	14.6
						<hr/> 95.7 m <sup>3</sup> <hr/>
	Deductions					
	Beams (I)	2	26	0.23	0.6	7.17
	(ii)	2	15	0.23	0.15	1.035
	Rolling shutter, R	1	3	0.23	3	2.07
	Opening, O	1	1.5	0.23	2.1	0.72
	Door, D	1	1.5	0.23	2.1	0.72

Sl. No	Description of work	No	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
7.	Window, W	8	2	0.23	1.2	4.41
	Ventilator, V	4	2	0.23	0.6	1.104
	V1	2	0.6	0.23	0.6	0.17
	V2	1	1	0.23	0.6	0.138
						<hr/> 78.16 m <sup>3</sup> <hr/>
	Brick work in cm 1:4, 110 mm Tk, incl. Both sides plastering:-					
	Wall between store & passage & w.c.	3	3	--	4	36
	" store & kitchen	1	6.2	--	4	24.8
	" w.c.	1	1.5	--	4	6
						<hr/> 66.8 m <sup>2</sup> <hr/>
Deduction						
Door, D	1	1.5	--	2.1	3.15	
D1	2	1	--	2.1	4.2	
					<hr/> 59.45 m <sup>2</sup> <hr/>	
8.	R.C.C. 1:2:4 for slab	1	15.23	26.23	0.15	59.92 m <sup>3</sup>

Sl. No	Description of work	No	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
9.	R.C.C. 1:2:4 for Beam					
	(i)	4	26	0.3	0.6	18.72
	(ii)	4	15	0.3	0.15	2.7
						<u>21.42 m<sup>3</sup></u>
10.	R.C.C. 1:2:4 for sunshade	6	2.3	0.6	0.06	0.5 m <sup>3</sup>
11.	Weathering course in lime mortar with pressed tiles at top	1	15.23	26.23	--	399.48 m <sup>2</sup>
12.	Plastering in CM 1:4, 12mm Tk					
	Ceiling	1	14.77	25.77	--	380.62
	Beam sides	3	14.77	--	0.9	39.89
	"	3	25.77	--	0.9	23.19
						<u>443.17 m<sup>2</sup></u>
13.	P.C.C. 1:4:8 for flooring concrete	1	14.77	25.77	0.12	45.67 m <sup>3</sup>
14.	Granolithic floor finish, in cm 1:3, 20mm Tk	1	14.77	25.77	--	380.62 m <sup>2</sup>
15.	Sand filling in basement	1	14.77	25.77	0.3	114.18 m <sup>3</sup>

Sl. No	Description of work	No	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
16.	White washing, 2 coats					
	As same as 12	--	--	--	--	443.7
	78.26	--	--	--	--	689.2
	From 6, = $\frac{78.26}{0.23}$ (2)					
	From 7, = 59.45 (2)	--	--	--	--	118.9
						<u>1251.81 m<sup>2</sup></u>
17.	Rolling shutter, R	1	3	--	3	9 m <sup>2</sup>
18.	Doors & windows of good quality country wood:-					
	D	2	1.5	--	2.1	6.3
	D1	2	1	--	2.1	4.2
						<u>10.5 m<sup>2</sup></u>
	Window, W	8	2	--	1.2	19.2 m <sup>2</sup>
19.	Jolly work for ventilators					
	V	4	2	--	0.6	4.8
	V1	2	0.6	--	0.6	0.72
	V2	1	1	--	0.6	0.6
						<u>6.12 m<sup>2</sup></u>

**5.3 DETAILED ESTIMATE FOR NON-VEG. RESTAURANT:-**

Sl. No	Description of work	No	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
1.	Earth work Excavation	14	2.35	1.5	1.8	88.83 m <sup>3</sup>
2.	P.C.C. 1:4:8 for mat concrete	14	2.35	1.5	0.15	7.4 m <sup>3</sup>
3.	R.C.C. 1:2:4 for footing	14	2.35	1.5	0.3	14.8 m <sup>3</sup>
4.	R.C.C. 1:2:4 for column	14	0.525	0.3	5.6	12.35 m <sup>3</sup>
5.	R.C.C. 1:2:4 for plinth beam					
	-- around --	1	80	0.3	0.3	7.2
	cross wall	1	9.7	0.3	0.3	0.87
						<hr/> 7.97 m <sup>3</sup> <hr/>
6.	Brick work in cm 1:4 Incl. Both side plastering around	1	80	0.23	3.7	68.08
	cross wall	1	9.77	0.23	3.7	7.92
						<hr/> 76 m <sup>3</sup> <hr/>
	Deductions					
	Opening (O)	1	1.5	0.23	2.1	0.72
	Rolling shutter (R)	1	3	0.23	3	2.02
	Door, D	1	1.5	0.23	2.1	0.72
	Window, W	9	2	0.23	1.2	4.97
	Ventilators, V1	4	0.6	0.23	0.6	0.33
	V2	1	2	0.23	0.6	0.276
	V	3	3	0.23	0.6	1.24
						<hr/> 65.67 m <sup>3</sup> <hr/>

Sl. No	Description of work	No	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
7.	Brick work in cm 1:4, 110 mm Tk, incl. Both sides plastering:-					
	Wall between store & passage & w.c.	2	3	--	4	24
	" store & kitchen	2	3	--	4	24
	" w.c.	1	4.5	--	4	18
						<hr/> 66 m <sup>2</sup>
	Deduction					
	Door, D1	2	1	--	2.1	4.2
	D	1	1.5	--	2.1	3.15
						<hr/> 58.65 m <sup>2</sup>
8.	R.C.C. 1:2:4 for slab	1	10.23	30.23	0.15	46.39 m <sup>3</sup>
9.	R.C.C. 1:2:4 for Beam					
	(i)	7	9.475	0.3	0.45	8.95
	(ii)	2	30	0.3	0.35	5.4
						<hr/> 14.355 m <sup>3</sup>
10.	R.C.C. 1:2:4 for sunshade	4	2.3	0.6	0.06	0.33 m <sup>3</sup>
11.	Weathering course in lime mortar with pressed tiles at top	1	10.23	30.23	--	309.25 m <sup>2</sup>
12.	Plastering in CM 1:4, 12mm Tk					
	Ceiling	1	9.77	29.77	--	290.85
	Beam sides	6	9.77	29.77	--	52.76
						<hr/> 343.6 m <sup>2</sup>
13.	P.C.C. 1:4:8 for flooring concrete	1	9.77	29.77	0.12	34.9 m <sup>3</sup>

Sl. No	Description of work	No	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
14.	Granolithic floor finish, in cm 1:3, 20mm Tk	1	9.77	29.77	--	290.85 m <sup>2</sup>
15.	Sand filling in basement	1	9.77	29.77	0.3	87.25 m <sup>3</sup>
16.	White washing, 2 coats As same as 12 – 343.6	--	--	--	--	343.6
	65.67	--	--	--	--	580.6
	From 6, = ----- (2)	--	--	--	--	117.3
	0.23	--	--	--	--	1041.5 m <sup>2</sup>
	From 7, = 58.65 (2)	--	--	--	--	
17.	Rolling shutter, R	1	3	--	3	9 m <sup>2</sup>
18.	Doors & windows of good quality country wood:-					
	Door, D	2	1.5	--	2.1	6.3
	D1	2	1	--	2.1	4.2
						10.5 m <sup>2</sup>
	Window, W	9	2	--	1.2	21.6 m <sup>2</sup>
19.	Jolly work for ventilators					
	V	3	3	--	0.6	5.4
	V1	2	0.6	--	0.6	0.72
	V2	1	2	--	0.6	1.2
						7.32 m <sup>2</sup>

**5.4 DETAILED ESTIMATE FOR SHOPPING COMPLEX:-**

Sl. No	Description of work	No .	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
<u>(A) Ground Floor:-</u>						
1.	Earthwork excavation	52	1.75	1.75	1.8	290.34 m <sup>3</sup>
2.	P.C.C. 1:4:8 for mat concrete	52	1.75	1.75	0.18	23.89 m <sup>3</sup>
3.	R.C.C. 1:2:4 for footing	52	1.75	1.75	0.3	47.78 m <sup>3</sup>
4.	R.C.C. 1:2:4 for column	52	0.3	0.3	5	23.4 m <sup>3</sup>
5.	R.C.C. 1:2:4 for plinth Beam					
	Cross beam	32	5	0.3	0.3	14.4
	Alround beam	28	6.5	0.3	0.3	16.38
	Verandah beam	16	6.5	0.3	0.3	9.36
						40.14 m <sup>3</sup>
6.	Brick work in cm 1:4 Incl. Both sides plastering:					
	Cross wall	30	5	0.23	4.15	143.515
	“	14	6.5	0.23	4	83.72
	cloak wall	1	3	0.23	4	2.76
						229.65 m <sup>3</sup>
7.	Brickwork in cm 1:4, 110 mm Tk incl., both sides plastering	25	5	--	3.7	462.5 m <sup>2</sup>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
8.	R.C.C. 1:2:4 for slab:					
	Shop room	26	5	6.5	0.15	126.75
	Verandah	16	2	6.5	0.12	24.96
	sides	1	10.5	10	0.12	12.6
	others	--	--	--	--	12.0
						<u>176.3 m<sup>3</sup></u>
9.	R.C.C. 1:2:4 for beam					
	st. beam	28	6.5	0.3	0.3	16.38
	cross beam	32	5	0.3	0.15	7.2
	Verandah	16	6.5	0.3	0.45	14.04
	Verandah	3	6.5	0.3	0.3	1.755
						<u>39.375 m<sup>3</sup></u>
10.	Plastering in CM 1:4, 12mm Tk.					
	ceiling – shops	26	5	6.5	--	845
	- verandah	16	2	6.5	--	208
	- sides	1	10.5	10	--	105
	- Beam sides	21	1.2	4	--	100.8
	- “	3x14	6.5	0.6	--	163.8
						<u>1422.6 m<sup>2</sup></u>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
11.	P.C.C. 1:4:8 for flooring concrete					
	shops	26	5	6.5	0.15	126.75
	verandah	16	2	6.5	0.15	31.2
	sides	1	10.5	10	0.15	15.75
	"	1	16	6.5	0.15	15.6
						189.3 m <sup>3</sup>
12.	Granolithic floor finish cm 1:3, 20mm Tk					
	189.3					
	As per 11 = $\frac{189.3}{0.15}$	--	--	--	--	1262 m <sup>2</sup>
13.	Sand filling in basement					
	189.3					
	As per 11 = $\frac{189.3}{0.15}(0.45)$	--	--	--	--	567.99 m <sup>3</sup>
14.	White washing, 2 coats					
	-- as per 10 – 1422.6	--	--	--	--	1422.6
	-- as per 7 – 462.5 (2)	--	--	--	--	925
	239.65					
	-- as per 6 = $\frac{239.65}{0.22}(2)$	--	--	--	--	1996.9
						4344.85m <sup>2</sup>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
	<b>(B) FIRST FLOOR:-</b>					
15.	R.C.C. 1:2:4 for Column	60	0.3	0.3	3.6	19.44 m <sup>3</sup>
16.	Brick work in cm 1:4, Incl. both sides plastering					
	all round walls	3x14	6.5	0.23	2.55	160.4
	cross walls	2x15	5	0.23	2.7	93.15
						253.26 m <sup>3</sup>
	<u>Deduction:-</u>					
	Door, D	52	1.2	0.23	2.1	30.14
	Window, W	52	1.2	0.23	1.2	17.22
						205.9 m <sup>3</sup>
17.	Brick work in cm 1:4, 110 mm Incl. both sides plastering					
	Toilet wall	52	3.5	--	3	546
	cross wall	26	5	--	3	390
						936 m <sup>2</sup>
	hand rails	1	230	--	0.75	+172.5
	Deductions:					
	Door	52	1	--	2.1	-109.2
	ventilator, v	52	0.6	--	0.6	-18.72
						980.58 m <sup>2</sup>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
18.	Granolithic floor finish cm 1:2, 20 mm Tk rooms	26	5	6.5	--	845
	verandah	15	3.5	6.5	--	341.25
	sides	1	10	4	--	40
						<u>1226.25 m<sup>2</sup></u>
19.	R.C.C. 1:2:4 for slab rooms	26	5	6.5	0.15	126.75
	verandah	15	3	6.5	0.12	35.1
	sides	1	4	10	0.15	6
						<u>167.55 m<sup>3</sup></u>
20.	R.C.C. 1:2:4 for beam st. beam	3x14	6.5	0.3	0.45	36.855
	cross beam	30	5	0.3	0.3	13.5
	cantilever beam	30	1.5	0.3	0.225	3.04
						<u>53.39 m<sup>3</sup></u>
21.	Plastering cm 1:4, 12mm Tk ceiling	26	5	6.5	--	845
	verandah	26	1.5	6.5	--	253.5
	sides	2	2	10	--	40
						<u>1138.5 m<sup>2</sup></u>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
22.	Weathering course in lime mortar with pressed tiles at top as per 21.	--	--	--	--	1138.5 m <sup>2</sup>
23.	Jolly work for ventilator	52	0.6	--	0.6	18.72 m <sup>2</sup>
24.	Doors of windows of wood quality country wood					
	Door, D1	52	1	--	2.1	109.2
	" D	52	1.2	--	2.1	131.02
	Window, W	52	1.2	--	1.2	74.88
25.	White washing, 2 coats					
	-- as per 21 --	--	--	--	--	1138
	-- as per 16 = $\frac{205.9}{0.23}$ (2)	--	--	--	--	1790.4
	-- as per 17 = 980.55 (2)	--	--	--	--	1961.6
						4889.5 m <sup>2</sup>
26.	Rolling shutters	51	3	--	3	459 m <sup>2</sup>
27.	<u>Staircase details:-</u> R.C.C. 1:2:4 for slab					
	Inclined landing	2	4.47	2	0.2	3.6
		1	4	2	0.2	1.6
						5.2 m <sup>3</sup>
28.	Brick work cm 1:4, incl plastering	26	2	0.3	0.15	1.17 m <sup>3</sup>
					2	

### 5.5 DETAILED ESTIMATE FOR TOWN BUS STAND:-

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
1.	Earthwork excavation	92	1.5	1.5	1.8	372.6 m <sup>3</sup>
2.	P.C.C. 1:4:8 for mat concrete	92	1.5	1.5	0.15	31.05 m <sup>3</sup>
3.	R.C.C. 1:2:4 for footing	92	1.5	1.5	0.3	62.1 m <sup>3</sup>
4.	R.C.C. 1:2:4 for column	92	0.3	0.3	5.5	45.54 m <sup>3</sup>
5.	R.C.C. 1:2:4 for plinth Beam					
	Total around	1	392.3	0.3	0.3	35.3
	Cross beam	40	4.4	0.3	0.3	15.84
	"	1	3.4	0.3	0.3	0.306
	"	2	2.9	0.3	0.3	0.52
	"	2	1.9	0.3	0.3	0.34
						52.3 m <sup>3</sup>
6.	R.C.C. 1:2:4 for beam					
	$\frac{52.3}{5} = 10.46 \text{ (0.255)}$	--	--	--	--	44.455
	$\frac{52.3}{0.3} = 174.33$					
	cantilever beam	47	1.5	3	0.205	2.22
						46.67 m <sup>3</sup>

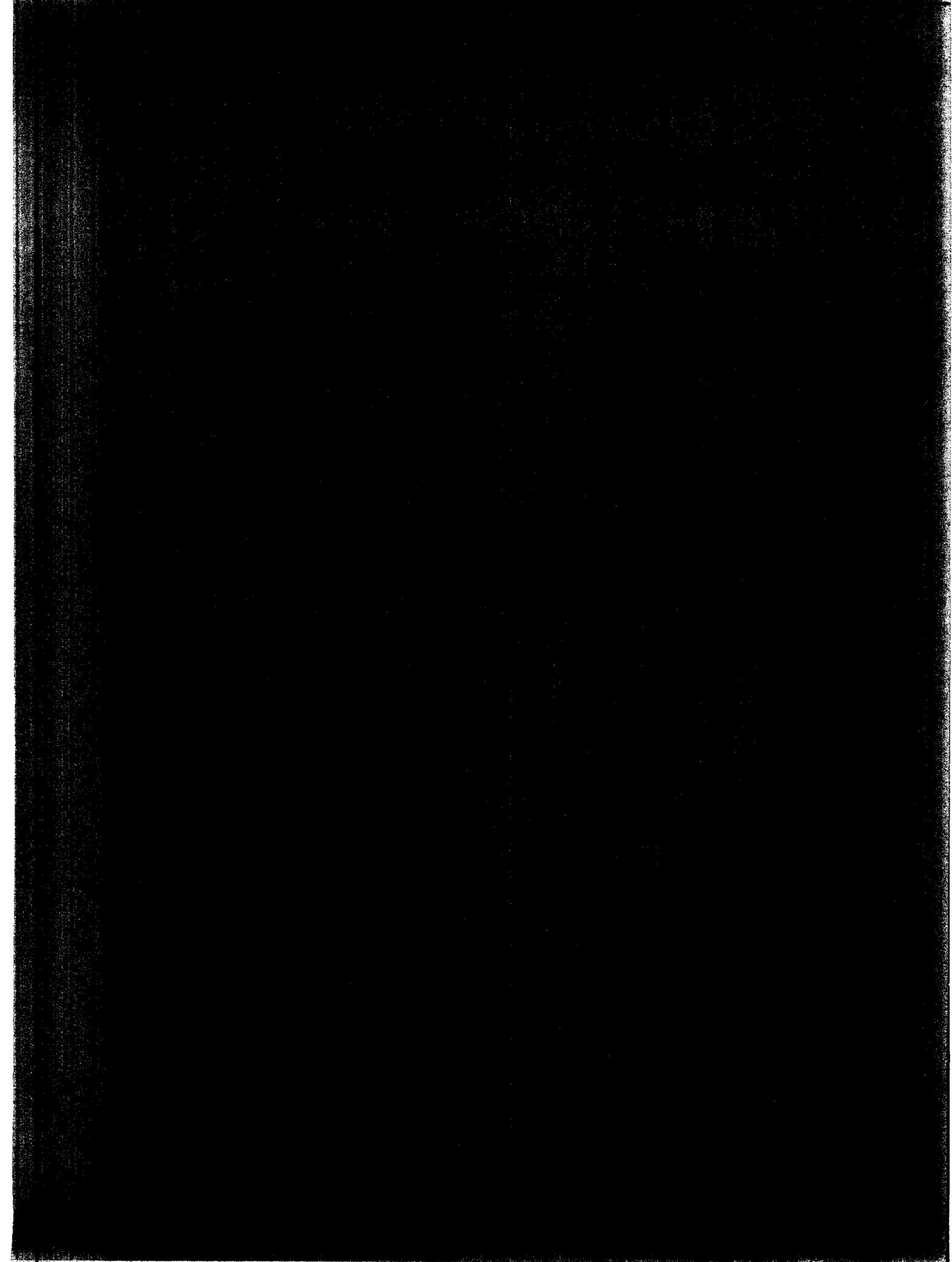
Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
7.	R.C.C. for slab					
	Total	1	195.45	5	0.12	117.27
	cantilever slab	1	176.07	1.5	0.12	31.6
						<u>148.96 m<sup>3</sup></u>
8.	P.C.C. 1:4:8 for flooring concrete	1	195.45	5	0.12	117.27 m <sup>3</sup>
9.	Gronalithic floor finish cm 1:3, 20mm Tk	1	195.45	5	--	977.25 m <sup>2</sup>
10.	Brick work in cm 1:4, Incl. both side plastering					
	Above plinth as per 5 control room	--	--	--	--	52.3
		1	18	0.23	3.75	15.5
	Deduction:-					<u>67.8 m<sup>3</sup></u>
	Door, D	1	1.2	0.23	2.1	-0.58
	Windows, W	2	1.2	0.23	1.2	-0.66
	lintel, L	3	1.5	0.23	0.23	-0.24
						<u>66.2 m<sup>3</sup></u>
11.	Plastering cm 1:4, 12 mm Tk					
	Column	92	1.2	--	3.7	408.78
	ceiling	1	195.45	5	--	977.25
	cantilever	1	176.07	1.5	--	264.10
	beam sides	40	4.4	--	0.51	105.60
	"	42	1.5	--	0.21	13.23
						<u>1768.95 m<sup>2</sup></u>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
12.	Weathering course in lime mortar with pressed tiles at top.					
	$\frac{148.96}{0.12}$	--	--	--	--	1245.34 m <sup>2</sup>
13.	Sand filling in basement					
	-- as per 9 – 977.2 (0.3)	--	--	--	--	293.17 m <sup>3</sup>
14.	White washing, 2 coats					
	-- as per 11 –	--	--	--	--	1768.95
	control room	1	18	--	3.75	67.6
						1836.45 m <sup>2</sup>
15.	Doors & windows of good quality country wood					
	Door, D	1	1.2	--	2.1	2.52 m <sup>2</sup>
	Window, W	2	1.2	--	1.2	2.88 m <sup>2</sup>

## 5.6 DETAILED ESTIMATE FOR TOILET 1:-

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
1.	Earth work Excavation					
	(i) around wall	1	51.88	0.75	0.9	35.02
	(ii) cross wall	1	3.98	0.75	0.9	2.69
	(iii) outer wall	1	4.625	0.75	0.9	3.12
						<hr/> 40.83 m <sup>3</sup>
2.	P.C.C. 1:4:8 for foundation					
	(i)	1	51.88	0.75	0.15	5.84
	(ii)	1	3.98	0.75	0.15	0.45
	(iii)	1	4.625	0.75	0.15	0.52
						<hr/> 6.81 m <sup>3</sup>
3.	R.R. masonry in cm 1:4					
	(i)	1	51.88	0.6	0.6	18.68
	(ii)	1	4.13	0.6	0.6	1.49
	(iii)	1	4.7	0.6	0.6	1.69
						<hr/> 21.86 m <sup>3</sup>
4.	C.R. masonry in cm 1:4,					
	(i)	1	51.88	0.3	0.23	5.84
	(ii)	1	4.43	0.3	0.23	0.5
	(iii)	1	4.85	0.3	0.23	0.55
						<hr/> 6.89 m <sup>3</sup>
5.	R.C.C. for plinth beam					
	(i)	1	51.88	0.3	0.23	3.58
	(ii)	1	4.43	0.3	0.23	0.31
	(iii)	1	4.85	0.3	0.23	0.334
						<hr/> 4.22 m <sup>3</sup>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
6.	Plastering in cm 1:4,12mm Tk ceiling	1	20.75	4.5	--	93.375 m <sup>2</sup>
7.	Brick work in cm 1:4 incl. both sides plastering. around wall	1	51.88	0.23	2.9	34.6
	cross wall	1	4.5	0.23	2.9	3
						<hr/> 37.6 m <sup>3</sup> <hr/>
	Deduction:-					
	Door, D	2	1.5	0.23	2.1	1.45
	ventilator, V	20	0.6	0.23	0.6	1.66
	“ V1	3	2	0.23	0.6	0.83
	“ V2	1	1.5	0.23	0.6	0.207
						<hr/> 33.45 m <sup>3</sup> <hr/>
8.	Brick work in cm 1:4,110mm Tk outer wall	1	4.89	--	2.5	12.25
	wall between w.c.	18	1.5	--	3	81
	“ w.c. & passage	1	25.75	--	3	77.25
	“ urinal	1	1	--	3	3
						<hr/> 173.5 m <sup>2</sup> <hr/>
	Deduction:-					
	Door, D	20	1	--	2.1	42
						<hr/> 131.5 m <sup>2</sup> <hr/>
9.	P.C.C. 1:4:8 for flooring concrete	1	20.75	4.5	0.12	11.2 m <sup>3</sup>
10.	Granolithic floor finish in cm 1:3, 20 mm Tk	1	20.75	4.5	--	93.375 m <sup>2</sup>



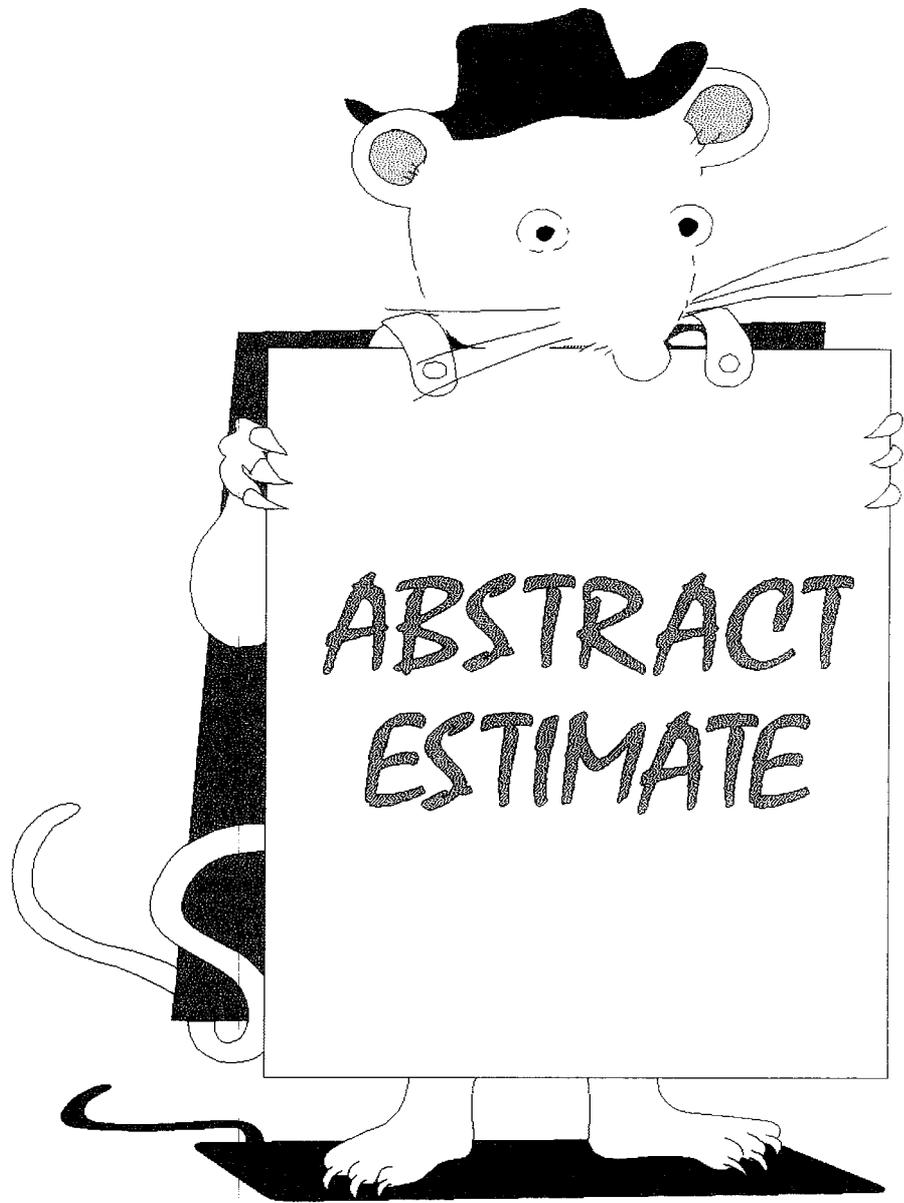
Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
11.	R.C.C. 1:2:4 for beam					
	alround wall	1	51.88	0.23	0.11	1.31
	cross wall	1	4.5	0.23	0.11	0.12
						1.43 m <sup>3</sup>
12.	R.C.C. 1:2:4 for slab	1	20.98	4.96	0.12	12.49 m <sup>3</sup>
13.	Weathering course in lime mortar with pressed tiles at top	1	20.98	4.96	--	104.06 m <sup>2</sup>
14.	Sand filling in basement	1	20.75	4.5	0.3	28.01 m <sup>3</sup>
15.	White washing 2 coats					
	-- as per 6 --	--	--	--	--	93.375
	32.45	--	--	--	--	290.87
	-- as per 7 = ----- (2)					
	0.23	--	--	--	--	262.2
	-- as per 8 - 131.1(2)					646.4 m <sup>2</sup>
16.	Doors of good quality country wood					
	Door, D	20	1	--	2.1	42
	" D1	2	1.5	--	2.1	6.3
						48.3 m <sup>2</sup>
17.	Jolly works for ventilator					
	V	20	0.6	--	0.6	7.2
	V1	3	2	--	0.6	3.6
	V2	1	1.5	--	0.6	0.9
						11.7 m <sup>2</sup>

### 5.7. DETAILED ESTIMATE FOR TOILET – 2:-

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
1.	Earth work Excavation					
	(iv) around wall	1	36.61	0.75	0.9	24.71
	(v) cross wall	1	2.48	0.75	0.9	1.67
	(vi) outer wall	1	2.625	0.75	0.9	1.77
						<u>28.15 m<sup>3</sup></u>
2.	P.C.C. 1:4:8 for foundation					
	(i)	1	36.61	0.75	0.15	4.13
	(ii)	1	2.48	0.75	0.15	0.28
	(iii)	1	2.625	0.75	0.15	0.29
						<u>4.69 m<sup>3</sup></u>
3.	R.R. masonry in cm 1:4					
	(i)	1	36.61	0.6	0.6	13
	(ii)	1	2.63	0.6	0.6	0.94
	(iii)	1	2.7	0.6	0.6	0.97
						<u>14.91 m<sup>3</sup></u>
4.	C.R. masonry in cm 1:4,					
	(i)	1	36.61	0.3	0.375	4.12
	(ii)	1	2.93	0.3	0.375	0.33
	(iii)	1	3	0.3	0.375	0.34
						<u>4.8 m<sup>3</sup></u>
5.	R.C.C. for plinth beam					
	(i)	1	36.61	0.3	0.23	2.526
	(ii)	1	2.93	0.3	0.23	0.2
		1	3	0.3	0.23	0.207
	(iii)					<u>2.93 m<sup>3</sup></u>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )	
6.	R.C.C. 1:2:4 for beam around cross wall	1	36.61	0.23	0.11	0.91	
		1	3	0.23	0.11	0.08	
							<u>0.99 m<sup>3</sup></u>
7.	R.C.C. 1:2:4 for slab	1	13.69	3.46	0.12	5.68	
		1	5.46	1.5	0.12	0.98	
							<u>6.66 m<sup>3</sup></u>
8.	Brick work in cm 1:4 incl. both sides plastering. around wall cross wall	1	36.61	0.23	2.89	24.33	
		1	3	0.23	2.89	2.08	
						<u>26.41 m<sup>3</sup></u>	
		Deduction:-					
		Door, D1	2	1.5	0.23	2.1	1.45
		ventilator, V	10	0.6	0.23	0.6	0.83
		“ V1	1	2	0.23	0.6	0.69
		“ V2	1	1.5	0.23	0.6	0.207
						<u>23.873 m<sup>3</sup></u>	
9.	Brick work in cm 1:4, 110mm Tk outer wall wall between w.c. “ w.c. & passage	1	3.04	--	2.1	6.38	
		10	1.5	--	3	45	
		2	6.5	--	3	39	
						<u>90.38 m<sup>2</sup></u>	
		Deduction:-					
	Door, D1	10	1	--	2.1	21.0	
						<u>69.38 m<sup>2</sup></u>	
10.	Plastering in cm 1:4, 12mm Tk ceiling “	2	6.5	3	--	39	
		1	5	1.5	--	7.5	
							<u>46.5 m<sup>2</sup></u>

Sl. No	Description of work	No.	L (m)	B (m)	D (m)	Quantity (m <sup>3</sup> )
11.	P.C.C. 1:4:8 for flooring concrete -- as per 10 – 46.5 (0.12)	--	--	--	--	5.58 m <sup>3</sup>
12.	Granolithic floor finish in cm 1:4, 20 mm Tk -- as per 10 --	--	--	--	--	46.5 m <sup>2</sup>
13.	Sand filling in basement	2	6.5	3	0.3	11.7
		1	1.5	5	0.3	2.25
						<u>13.95 m<sup>3</sup></u>
14.	White washing, 2 coats					
	ceiling	--	--	--	--	46.5
	outside	--	--	--	--	111.9
	inside	--	--	--	--	198.7
						<u>357.13 m<sup>2</sup></u>
15.	Weathering course in lime mortar with pressed tiles at top 6.66 -- as per 7 = -----	--	--	--	--	46.5 m <sup>2</sup>
16.	Doors of good quality country wood Door, D " D1	10 2	1 1.5	-- --	2.1 2.1	21 6.3
						<u>27.3 m<sup>2</sup></u>
17.	Jolly works for ventilator V V1 V2	10 1 1	0.6 5 1.5	-- -- --	0.6 0.6 0.6	3.6 3 0.9
						<u>7.5 m<sup>2</sup></u>



## 6. ABSTRACT ESTIMATE

### 6.1 AS PER PWD SCHEDULE OF RATES 1997 – 98

S. No	Description of work	Rate	Per
1.	Earth work excavation	33	m <sup>3</sup>
2.	P.C.C. 1:4:8 for mat concrete	1195	m <sup>3</sup>
3.	R.C.C. 1:2:4 (Incl. steel)	3720	m <sup>3</sup>
4.	R.R. masonry, cm 1:4	1113	m <sup>3</sup>
5.	C.R. masonry, cm 1:4	1129	m <sup>3</sup>
6.	Brick work Incl. cm 1:4 (Incl. both side plastering)	1505	m <sup>3</sup>
7.	Brick work Incl. cm 1:4, 110mm Tk (Incl. both side plastering)	254	m <sup>2</sup>
8.	Plastering cm 1:4, 12mm Tk	41	m <sup>2</sup>
9.	Flooring concrete, 1:4:8	1195	m <sup>3</sup>
10.	Granolithic floor finish, cm 1:3, 20mm Tk	49	m <sup>2</sup>
11.	White washing, 2 coats	3.65	m <sup>2</sup>
12.	Doors & Windows (Good quality country wood. Incl. all)	2500	m <sup>2</sup>
13.	Weathering course in lime mortar with pressed tiles at top	260	m <sup>2</sup>
14.	Jolly works for ventilators	200	m <sup>2</sup>
15.	Sand filling	402	m <sup>3</sup>
16.	A.C. sheet footing (incl. all)	242	m <sup>2</sup>
17.	Rolling shutters as per Highways Department	1000	m <sup>2</sup>
18.	WBM road works	150	m <sup>2</sup>

## 6.2 ABSTRACT ESTIMATE

S. No	Quantity (m <sup>3</sup> )	Description of work	Rate	Per	Amount
1.	1930.27	Earth work excavation	33	m <sup>3</sup>	63,699.00
2.	166.3	P.C.C. 1:4:8 for mat concrete	1195	m <sup>3</sup>	1,98,728.00
3.	2495.57	R.C.C. 1:2:4 (Incl. steel)	3720	m <sup>3</sup>	92,81,586.00
4.	36.76	R.R. masonry, cm 1:4	1113	m <sup>3</sup>	40,914.00
5.	11.71	C.R. masonry, cm 1:4	1129	m <sup>3</sup>	13,221.00
6.	984.768	Brick work Incl. cm 1:4 (Incl. both side plastering)	1505	m <sup>3</sup>	14,82,076.00
7.	1762.06 m <sup>2</sup>	Brick work Incl. cm 1:4, 110mm Tk (Incl. both side plastering)	254	m <sup>2</sup>	4,47,563.00
8.	11914.2 m <sup>2</sup>	Plastering cm 1:4, 12mm Tk	41	m <sup>2</sup>	4,88,479.00
9.	1380.2	Flooring concrete, 1:4:8	1195	m <sup>3</sup>	16,49,602.00
10.	10786.845 m <sup>2</sup>	Granolithic floor finish, cm 1:3, 20mm Tk	49	m <sup>2</sup>	5,28,555.00
11.	3057.55	Sand filling	402	m <sup>3</sup>	12,29,137.00
12.	7217.89 m <sup>2</sup>	Weathering course in lime mortar with pressed tiles at top	260	m <sup>2</sup>	18,76,651.00
13.	21024.3 m <sup>2</sup>	White washing, 2 coats	3.65	m <sup>2</sup>	76,739.00
14.	339.36 m <sup>2</sup>	Doors (Good quality country wood. Incl. all)	2500	m <sup>2</sup>	8,48,400.00
15.	118.56	Window(Incl.wood + grill + glass)	2500	m <sup>2</sup>	2,96,400.00
16.	52.08 m <sup>2</sup>	Jolly works	200	m <sup>2</sup>	10,416.00
17.	477 m <sup>2</sup>	Rolling shutters	1000	m <sup>2</sup>	4,77,000.00
18.	1931.7 m <sup>2</sup>	A.C. sheet footing (incl. all)	243	m <sup>2</sup>	4,69,403.00
<b>TOTAL</b>					<b>1,94,66,469.00</b>

**Lump-sum Provisions:**

1. Electrical works (7.5%)	=	14,00,000.00
2. Water supply & Sanitary works (3.5%)	=	6,50,000.00
3. Gardening	=	2,00,000.00
4. Compound wall	=	3,00,000.00
5. Road median	=	1,50,000.00
6. Clearing the site	=	2,00,000.00
		-----
TOTAL	=	29,00,000.00
		-----

**6.3 WBM Road Works:**

Total area	=	17,459.64 m <sup>2</sup>
Cost of construction	=	17,459.64 (150)
	=	26,18,946.00
Total cost of project	=	2,49,85,415.00
	≈	2.5 CRORES

As per PWD Schedule of Rates, 1997 – 98

1.	Waiting plat form	=	1,03,31,191.00
2.	Veg. Restaurant	=	10,42,045.00
3.	Non Veg. Restaurant	=	8,59,021.00
4.	Shopping Complex	=	61,24,899.00
5.	Town Bus Stand	=	24,34,734.00
6.	Toilet (1)	=	4,53,921.00
7.	Toilet (2)	=	2,63,319.00

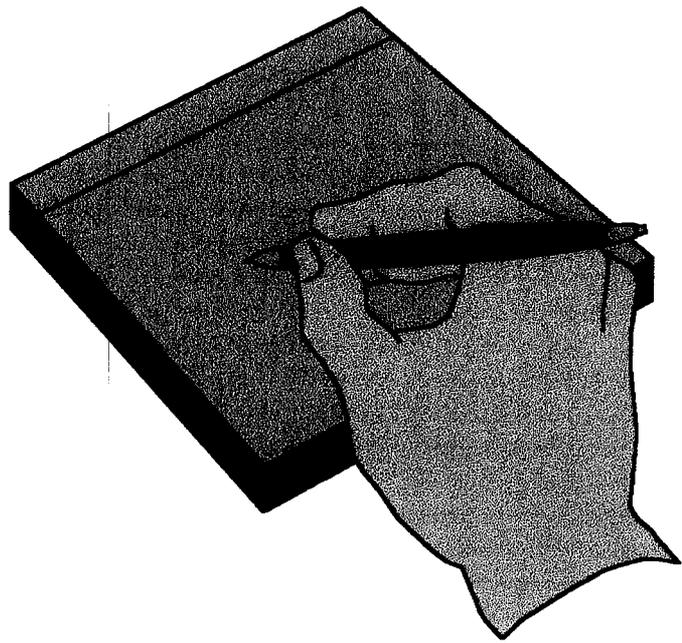


# RECOMMENDATIONS

## **7. RECOMMENDATIONS**

We are proud to conclude that this project will be useful for the public in various aspects. Some prime recommendations are:

1. Since the estimated cost of waiting platform is about one Crore, as an alternative steel frame structures can also be preferred to reduce the cost.
2. Along with the construction of Bus stand, we also suggest the Railway Department to increase the frequency of train facility between Coimbatore and Mettupalayam.
3. If it is felt that Tudiyalur is far away from Gandhipuram (i.e., 10 Kms) another site near Tamilnadu State Transport Corporation – Depot at Kavundampalayam can also be preferred.



**CONCLUSION**

## **8. CONCLUSION**

The decentralisation policy of bus stands has been successfully implemented in case of Ukkadam bus stand hence it is sure that, the proposed bus stand at Tudiyalur will definitely serve its purpose.

In this project a well-planned layout with all necessary facilities is prepared. This will facilitate the functioning of the bus stand smoothly.

The real purpose of this bus stand is not only to accommodate buses but also for the development of community with common interest.



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**DRAWINGS**