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DESIGN OF FORMWORK FOR MULTIPURPOSE AUDITORM

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Abstract- This paper deals with the study of design of formwork for multi-purpose auditorium. Design of formwork is important to ensure the strength and durability of the structure. Based on the 1997 OSHA accident statistics, Huang and HIZE (2003) report that 5.83% of falls were attributed to the construction of formwork. And 21.2% of all struck by accident, involved formwork construction. Hence this paper deals with the complete design of multi purpose Auditorium.

1.INTRODUCTION:

Formwork is a kind of temporary structure whose purpose is to support its own weight and that of a freshly placed concrete as well as the construction live load including materials, equipment and workmen. Formwork components are highly loaded for few hours during concrete placement. Hence we can design these components by allowing higher permissible stresses as compared to the stresses taken for the design of permanent structures.

2. NEED FOR FORMWORK DESIGN:

Formwork needs to be designed and built accurately to get desired shape, size, position, correct location, quality and finish of acceptable quality of caste concrete. If formwork is designed properly, one need not to provide any plastering or painting over the concrete surface. Formwork needs to be built adequately so that it is capable of supporting all the dead and live loads without danger to the workmen and to the concrete surface.

3. LOAD CONSIDERATIONN FOR DESIGN OF FORMWORK:

- Self weight of formwork materials.
- Weight of freshly placed concrete.
- Wind load.
- Earthquake load.
- Thermal load.

4. MATERIALS USED IN FORMWORK AND THEIR SPECIFICATIONS:

FOUNDATION WALL DESIGN:

❖ **Ply wood:**

Thickness	19mm
Allowable bending stress	0.34KN/m
Allowable shear stress	9.75KN/m
Permissible EI value	2.73KN/m²

❖ **Timber:**

E	$7.0x10^3$N/mm²
Permissible bending stress	10N/mm²
Permissible shear stress	1.0N/mm²

❖ **Steel:**
Tie rod of 16mm dia.

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COLUMN FORMWORK DESIGN:

- **Plywood:**

Thickness	12mm
Permissible bending stress	14N/mm²
Permissible bending moment	0.2KNm/m
Permissible shear force	6.16KN
Permissible deflection	Span/360

- **Timber:**

Thickness	12mm
Size	100mmx100mm
Permissible bending stress	7N/mm²

SLAB AND BEAM FORMWORK DESIGN:

- **Plywood:**

Thickness	12mm
Allowable bending stress	0.34KN/m

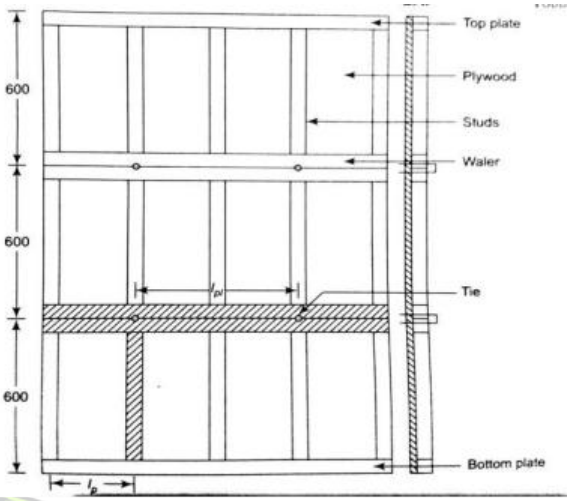
- **Timber:**

Size	100mmx100mm
Allowable bending stress	7N/mm²
Allowable Shear stress	0.60N/ mm²
Bending moment capacity	1.167KN/m
Shear force capacity	6KN
EI	64.16KNm²

5. DESIGN RESULTS

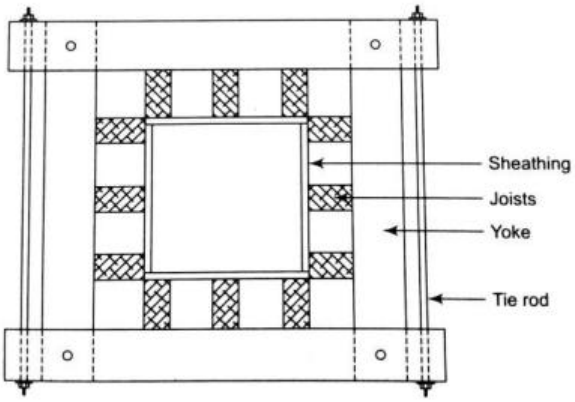
FOUNDATION DESIGN RESULT:

Sheeting	0.381m
Stud	834.15mm
Tie rod	1116.25mm
Top & Bottom plates	50.8mmx101.6mm



COLUMN DESIGN RESULT:

Sheeting	170mm
Joist	605mm
Yoke	363mm



SLAB AND BEAM DESIGN RESULT:

Sheeting	460mm
Secondary beam	1640mm
Primary beam	1021mm
Props	3100mm(CT340 props)

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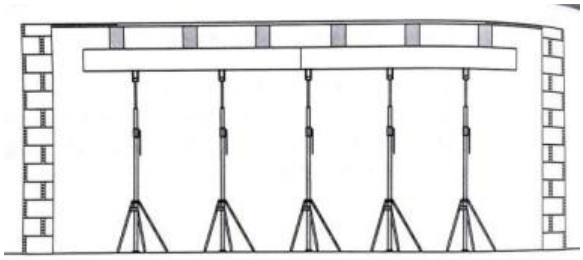

6.CONCLUSION:

Formwork design is very important to increase the strength and durability of the building. We learn tolerance limit and specification of various materials used for formwork deign. We have consider the various kinds of load such as live load, dead load, wind load, earth pressure, earthquake load .In India the awareness on formwork design is very less so we have to brought a new methods for construction field to get an improved construction technique all over Indian.

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