

11.7.6 Structure

- Design for structural integrity.
- Consider a structural grid system of posts and beams to provide stiffness.
- Keep structural systems simple
- Consider extent of vertical supports internally and in large open areas.
- Examine large spans and cantilevers
- Make decisions on purlin / rafter spacings in roof framing
- Closer spacings provide a stronger roof structure

11.7.7 Codes

- Designers should maintain a continuing subscription to relevant code supplies and other trace publications
- Office libraries should be kept up to date with current codes
- It is not satisfactory to expect builders and tradesmen to build to a list of codes specified if the specifier does not have the code, has not read it and does not fully understand it
- Note performance of code requirements so that better alternative solutions may be fed back to the code authorities.

11.7.8 Windows and Doors

- Check size and loads to be carried
- Design frames and their connections to walls
- Should shutters be used?
- Resolve conflict of wider windows for views and light and smaller windows for safety.

11.7.9 General Planning

- Consider alternative and innovative design solutions
- Check interior half-height walls and their stiffness.
- Good interior cross ventilation can be an advantage.
- Stiffen structure around most secure rooms
- Disposition and planning of internal spaces should fit into the structural system or vice versa

11.7.10 Costs and Estimates

- Evaluate costs of alternative solutions.
- Know the real costs of the individual elements

11.7.11 Selection of Finishes

- Are wall and ceiling linings suspect when wet?
- Are external walls debris resistant and water resistant?
- Is there adequate bracing in wall planes, ceiling and roof planes and in internal partitions?
- Select type of wall cladding materials, bricks, blocks or sheeting
- Check higher pressure areas at walls and roofs near corners and profile changes.
- Check type of sheeting, thickness and fixing
- Check that manufacturers instructions are adequate for the disaster area in which the building is constructed.

11.7.12 Details

- Check weak joints such as half-height wall with windows above where joint of vertical cantilevered wall and window needs stiffness to resist breaking or overturning (wind, flood, earthquake).
- Check flashings to roofs and ensure adequate fixings are provided
- Parapets should be reinforced.
- Tying-down of roof members should extend down into foundations
- There are technical details available to fix windows into frames but the actual fixings are seldom made correctly.
- Details of fixings of structure and claddings at edges and corners is very important.

11.7.13 Claddings

- When selecting claddings for walls and roofs examine thickness of material for the proposed use.
- Examine manufacturer's instructions and verify that they are suitable for the job.
- Check method of fixing of all materials.
- Check type and number of fixings used: nails, screws, glue, bolts, etc
- Verify that the material selected is suitable for the job
- Does the material have any debris resistance?
- What happens to the material when it breaks?
- Does the material add stiffness to the frame?
- Does the material still have strength after breaking?

11.8 INSPECTOR'S CHECKLISTS FOR SCHOOLS

It is recommended that checklists be prepared for various stages of school inspections, design, documentation and construction inspections.

The lists presented here are not conclusive but suggest topics that could be listed, developed or reviewed depending on the needs of the country nationally or regionally.

A Regional check list for cyclone damage could be prepared

It is suggested that each region prepare a single page sheet for each school showing:

- Rough site plan and location.
- Number of classrooms and students (approximately).
- Notes on areas prone to disaster attack.
- Space for brief damage report.

Regions could subsequently provide overall reports to zone Headquarters.

Check lists could be under the following headings:

11.8.1 For Annual Inspection of Schools

- For design of schools generally.
- For quality of equipment.
- For standards of cleanliness.
- For maintenance requirements
- For upgrading to meet current standards
- For light, ventilation, acoustics and orientation.
- For site planning, landscaping and fencing.

11.8.2 For Documentation of Basic Plans

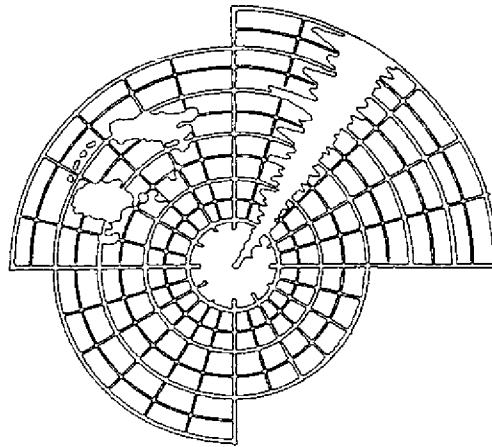
- Draw all construction details needed
- Develop typical details.
- Prepare site and landscaping plan.
- Prepare standard specification clauses.

11.8.3 For Construction Details

- Ridge of roof to roof cladding
- Barge of roof at gable.
- Fixing of roof cladding to purlins
- Avoid small battens where possible.
- Reduce spacing of purlins.
- Space purlins to suit cladding loads.
- Purlin to truss connection.
- Truss to rmg beam.
- Ring beam to foundation
- Door and window joints detail and fixing
- Verandah roof and supports.
- Bracing in roof plane.
- Bracing between trusses.
- Roof tiles to roof batten.
- Connections of bamboo members
- Alternate gable wall details.
- "J" hooks or bolt fixings to steel trusses, including more direct and positive fixing.
- Connection of brick walls to concrete column.
- Bracing or buttress to walls as required.
- Fixing spacings to C.I. roofs.
- Type and size of washers.
- Specify cover of concrete to reinforcement.
- Specify proper vibration given to concrete.
- Use innovative materials for low cost schools.

11.8.4 For Contract Administration

- Check quality of materials, e.g. sand, cement, timber, etc...
- Check standard of workmanship.
- Is brickwork connected to concrete columns.
- Is roof structure tied down in a continuous manner to the foundations.
- Check all connections, especially roof sheeting to purlins, purlins to rafters or trusses, truss or rafter connection to rmg beam.
- Ensure that roof bracing is installed.
- Check ridge and barge fixings
- Check cover of reinforcement in concrete is as specified
- Ensure concrete is properly vibrated during placing.



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