

Journal
of the
ASSOCIATION OF ENGINEERS

J.A.E. Vol. XXXIII

No. 1

Editorial Notes.

Pre-Stressed Concrete :

The need for economy of our main Structural Materials: Steel and Cement, has led to the development of a type of structure known as, "Pre-stressed Concrete Structure".

In pre-stressed concrete structures High-tensile steel wire is initially stretched and placed within the concrete so as to keep it under sufficient compression to prevent it from cracking under the tensile forces to which it would be subjected under the designed load. This makes the weight of concrete 50% less than that required in an ordinary re-inforced concrete structure and the quantity of high tensile steel 50 to 75 per cent less than that of the corresponding mild steel.

Such economy under the present stringent conditions of material supply and finance is of great importance to us and we are therefore happy to have in this issue a paper on "*the design of Pre-stressed Concrete Storage Tanks*" presented to the Association by Sri U. P. Mullick for reading and discussion.

Careful study of the paper is necessary to determine the most economical limits of the design to avoid necessary waste of time involved in the process of trial and error.

Ship-building Yard :

The need for modernisation of ship-building yards is being felt in every country and, in India, the need felt is not only for modernisation of old yards but also for establishment of new shipyards, as there are not enough for her basic requirements of shipping.

India requires at least two million tons of shipping. Her present tonnage is only 600,000 tons. She still has to acquire 1,400,000 tons at least, which means not less than 175 ships of 8,000 tons each. But almost every shipyard in the world is fully booked for deliveries up to the end of 1961. She must therefore build her own ships. The present capacity of her only large ship-building yard at Vishakapatnam is two and a half to three ships a year. Improvement of production to four ships a year is not expected until completion of the second phase of the second year plan and the maximum capacity expected is not more than six ships or 50,000 tons a year. Even at this maximum rate it would take not less than 28 years to reach the target of two million tons. It is imperative therefore that the necessary number of efficient shipyards be established in every suitable locality with the utmost speed. There has been much talk and much consideration as to where the second ship-building yard should be established; each state on the coast has a claim and there is likelihood of political bickering if only one shipyard is established. Every yard to be established cannot hope to produce ships economically, owing to existence of certain natural difficulties, and some must receive more financial aid from the state than others directly or indirectly. It seems therefore that the Central Government will have to make provision for the necessary funds in the development plans. It should be the endeavour of all to make economical use of such funds provided, and for this purpose careful study should be made of the planning and organization of Ship-building Yards. In this issue we therefore publish an article on the subject by Shri R. Sen Gupta who has recently returned from higher training in a yard in Germany and is now engaged in a small shipyard on the Hooghly. An important factor in selection of the site of a ship-building yard is the availability of sufficient space to stock in advance enough steel and other material, necessary for construction, to cover delays in supply from works which are not in close proximity to the yard: The closer the site to the steel suppliers the more suitable the yard.

Another important factor is the depth and width of water and range of tide available for launching the ships. The depth must be suitable for the draught for which the ship is designed. The width must be sufficient for manoeuvring the ship after launching without hitting the other bank. The range of tide must be such that it would be possible to lay the full length of the necessary launching ways before the tide commences to rise and to complete the launching before they get silted up and before the tide begins to fall.

•Where the depth is not sufficient, provision must be made for deepening by dredging and river training: The site that has the natural depth and range of tide necessary for the particular type of ship to be built will be the more suitable.

In the planning and lay out of Modern shipyards great importance is given to the provision of sufficient area for various operations: Area of covered space for "prefabrication" by welding, area of open space for storage of small welded units, and further area for their successive assembly into larger units and still more area for their storage prior to final erection on the building berth. The relative spaces to be provided depend on the type of ship to be built and the relative proportions between riveting and welding to be adopted.

To speed up work provision must be made for Mechanical handling, heavy lifting appliances, machine riveting, automatic welding and gas cutting. Sufficient height must be provided in the covered space for turning large units, welded on one side, over to the other to enable down hand welding without cracking the previous weld. All appliances must be so placed as to ensure a continuous flow of work from the stockyard, through the workshops to the building berth. The importance of mechanical handling and heavy lifting appliances cannot be too strongly emphasised. Though these are costly, the returns they give will amply justify their cost.

To complete the building it is necessary to arrange for a suitable fitting out basin where heavy fittings can be installed without taking up space on the building berth and for a dry dock in which the bottom and the propeller can be attended to.

The number of berths in a ship-building yard must be related to the provisions of the fitting out basin so that as the "fitting out" of one ship is completed another is ready to be launched from the stocks and no idle time is lost between launching and fitting out or *vice versa*.

Apart from the requirements of the technique of ship-building, consideration must be given to the availability of trained labour and the facilities for housing them and providing drinking water for them.

The site where these are readily available is more suitable than one where trained labour has to be imported and a special housing colony has to be established.

Transport to the site by rail or road or waterway is an essential requirement without which all other advantages are nullified; and, therefore, every effort should be made to maintain good rail, road and waterway to the selected site of the yard from the steel works and from the residential districts of the employees.

The site to which such transport already exists will be more suitable than one to which new transport will have to be established by construction of road or railway.

In the selection of a site political bias must give way to the above considerations.