

4/10/04.

High Tensile Steel.

Where high tensile steel is proposed in the previous estimates, it has been assumed that the entire shelter and upper decks as well as the topside plating is of this material, and that the scantlings of these parts have been reduced 10% from those required for ordinary steel.

If the two materials are used side by side at the same level, say as two adjoining deck plates, then no advantage would be derived from the adoption of the stronger material, if the modulus of elasticity is the same for both materials. Both plates would break down at the limit of elasticity of the weaker material, say at 15 tons per sq inch. If any reduction at all is made in the scantlings on account of high tensile material used under such circumstances it will reduce the factor of safety by increasing the stress without increasing the limit of elasticity.

If the two materials are used side by side as above, and if the modulus of elasticity of the stronger material is greater than that of the weaker, then some advantage is derived from the adoption of the high tensile steel, because this steel will under these circumstances take a share of the work the combination has to do more nearly in

proportion to its greater tensile strength.
In other words when the ordinary steel
~~will be~~ arrives at its limit of elasticity
the stress on the high tensile steel
will be higher in the proportion of the
greater modulus of elasticity, and the con-
sequent break down point would therefore
correspond to a ^{higher} stress than the
limit of elasticity of the weaker
material.