

Discussion on Pre-fabricated Aluminium Housing

By

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At the beginning, I confess that being a representative from an Engineering Workshop and a person mostly engaged in managing affairs of such a concern, I feel a little out of place in talking to such an elite of specialists in housing construction. I shall be talking on behalf of my Company—Gresham & Craven of India (P) Ltd., Calcutta which are widely known as manufacturers of brake equipments for the railways of the world. But the design, fabrication, installation and maintenance of pre-fabricated, frameless, steel-mesh reinforced, if so necessary, aluminium housings of various ground plans, shapes and sizes have also been the activities of this company and it is in this context that I have taken to the floor.

I have keenly followed the paper on 'Housing' by Shri D. H. Rama Rao, the Dy. Chief Engineer, Mormugao Port Trust, Goa, when he expressed the difficulties of economic construction of temporary or semi-permanent buildings in a place like Goa where torrential rain-fall, stormy weather & exposure to corrosion owing to sea-water have always posed big problems. I strongly feel that our strong, portable and durable aluminium frameless buildings will be an adequate answer to this problem.

The building consists basically of rolled and alloyed aluminium section, deeply troughed for large moment of inertia resulting in a

strong structure that are shipped to the place of construction in identifying codes to suit the requirements of the customer and erected in a matter of hours.

As you must be well aware of, aluminium is highly resistant to corrosion because of the protective film of aluminium oxide that quickly forms and adheres to the surface. Also its large ability in reflecting heat and almost equal inability to absorb or radiate any, makes it an ideal material for housing.

If you combine the lightness of the structure (aluminium having specific gravity about 30% of that of steel), economy in erection and total elimination of maintenance and painting—a plus point for construction at Goa in particular, low transport cost, speedy and simple fixing, you have an ideal solution to the problem of housing.

Talking about the cost of construction, it is about Rs 35/- per sq. ft. i.e. about Rs. 350/- per sq. metre comparing very favourably, as you can easily see, with the cost put by Shri Rama Rao at Rs. 700/- per sq. metre even if made to loose specifications. Add to that the complete flexibility in choosing designs when the same house may be converted into a totally different one in a matter of few hours and you have a versatile housing indeed.

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The housing, again, has a remarkable recovery value. After dismantling, 90 to 95% of the materials can be re-used.

Shri Rama Rao mentioned storm and heavy rain fall as deterrent to house building in Goa. I admit that our housings have not been tested in a place like Cherrapunji but judging from its performance all over Eastern India where annual rain-fall amounts to 2,000 mm. our housing, because of its robust construction, has been seen to withstand a wind speed of 100 miles (160 kilometre) per hour even with the most adverse wind direction. So, vagaries of nature should not pose any problem at all.

Some of you, I suspect, may already, be questioning yourselves whether it is too good to be true and all. The actual users of our housings located all over India will testify to the claim. We have constructed housing for various central and state PWDS ; steel plants like HSL, TISCO ; DVC and many Fertilizer Companies, even the organisation which has allowed this conference hall to be used by us i.e. Geological Survey of India and the list continues. Even in Calcutta you have a few of our housings located very close to you, the National Library premises being one. Of course at our own Head Office-cum-Works located in Park Circus area in Central Calcutta, we not only display but live in such housings. You, honourable guests, are heartily welcome if you kindly call on us on any working day.

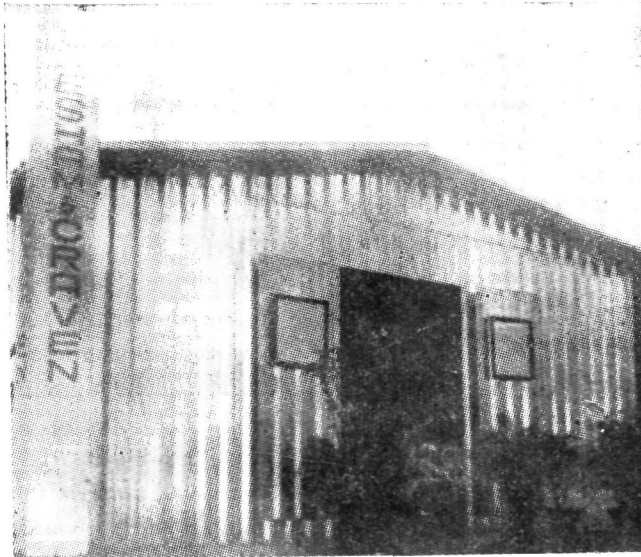
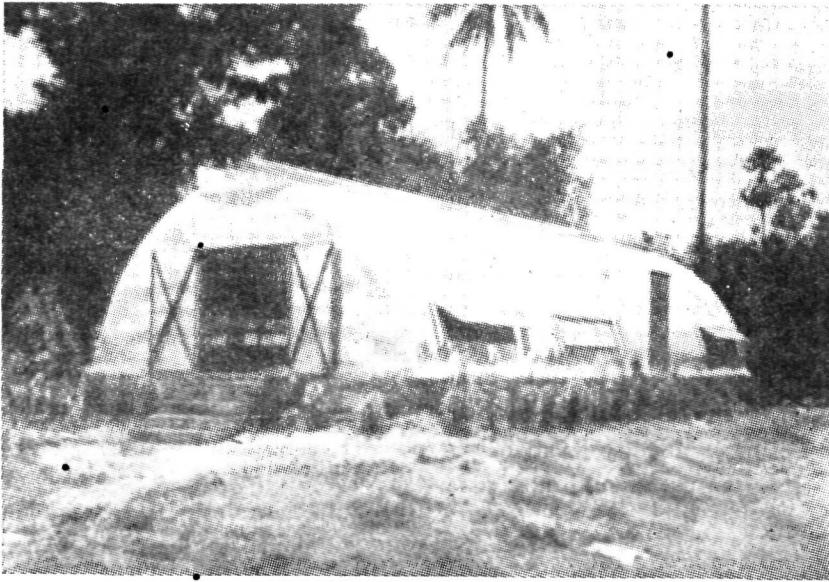
In January 1977, we displayed one of our housings in the Banga Sanskriti Sammelan at Calcutta Maidan. For erection we took only about 10 working hours—dismantling was effected in double quick time.

We had the idea of distributing today among you literature, specifications pictures etc. concerning our product, but unfortunately our press could not keep pace with our requirement.

Ladies and gentlemen, if you have begun to suspect that it is one of those ad-talks, then I confess that is what it is. But then I think that this Seminar will be an ideal place to make available some of our findings about aluminium housings about which, I am afraid, not much is known. There had been a temporary lull in our activity in this regard till recently but I want to emphasize that we are firmly back in business. Designs of a few of our standard products are shown in Photographs.

Answers to questions from the floor :

- 1) I have received a question from Shri Nair of G.S.I. asking about the effect of temperature and noise on our housings. As I have mentioned earlier, aluminium having excellent thermal properties in respect of insulation, our housings never faced much problem in this regard. Our office, as I have said earlier, is housed in such buildings and is quite comfortable in summer and winter. I may quote from a study made at British Guinea where the interior temperature during the 10 (ten) hottest days of May and June was found to be about 10°F less than that in a galvanized iron house (86°F in place of 96°F). The amount of heat transferred in B. T. U. per sq. ft. per hour was also considerably less compared to other standard wall materials (30 B.T.U. for aluminium, 69 for galvanized iron and 75 for asbestos mill-board). In this respect Alu-



minium comes closer even to brick work. I have all the time being talking about aluminium housing without any insulation whatsoever. But effective insulation by the use of false cardboard ceiling or commercial insulating material like 'Thermocole' are perfectly possible.

If Shri Nair so wants, he can put in an air conditioner, just an one tonner which will be enough for the use in a room measuring 25'—0" × 20'—0".

For noise also, we have never really come across any problem and there is no reason why we should. Again any unusual source of noise can be dampened by false ceiling. But if it is the sound of the rainfall. Shri Nair has in mind, I confess, I shall prefer the lullaby. Many of you may also agree.

2) Now on to the questions on the foundation, joints, chances of corrosion, material for roofing, the use of anodising and any other treatment for the housings I shall try to elucidate on the points one by one.

a) **Foundation**—The Aluminium buildings have remarkable ability to adapt itself to any level foundation of earth, wood or concrete. The load of the

aluminium structure is transmitted to the ground by anchor bolts firmly grouted and the floor itself does not take any load. So you have a remarkable choice of floorings.

b) **Joint**—The joint in our aluminium housing is often by metal to metal hook joint. Where fasteners are needed we settle for rust protected carbon steel or even stainless steel ones. As I have pointed out earlier, the remarkable resistance of aluminium against atmospheric corrosion makes any such building last 30 to 35 years without any corrosion whatsoever.

c) **Surface Treatment**—It is the same reason why no surface treatment whatsoever is needed. Aluminium is exposed to atmosphere directly. But for decorative purposes, if the customer so wants anodising can be thought of with marginal addition to the cost.

d) **Treatment**—It is for the earlier reasons that no treatment to the foundation or to the wall or to the roof is needed at all. You are guaranteed a leak and corrosion proof structure.

OBITUARY

The Association of Engineers, India, deeply mourns the sad demise of Shri Haranath Chakraborty who died at the ripe age of 87 years. He was a founder member of this Association and rendered ungrudging service for the growth of his beloved Association.