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CONSTRUCTION, MAINTENANCE AND QUALITY CONTROL OF BUILDING IN MYANMAR - PAST AND PRESENT

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Introduction

Union of Myanmar has a population of 52 millions residing within an area of 262,000 square miles. Its climatic and topographical diversities create a variety of construction materials and structures. The traditional architecture and method of constructing large structures date as far back as 11 century A D. The living evidence, among others are the Shwedagon Pagoda and several numbers of pagodas and shrines in Bagan. Yet it is lagging far behind in modernism. A number of causes, social, political and economic come in the way. There still are a lot of rooms to be improved. In attempting to introduce Myanmar's conditions in building industry to this forum, this paper presents its :

- Climatic and topographical differences,
- Type of structures in buildings,
- Construction materials,
- Techniques and quality control,
- Future needs and proposed international collaboration.

Climatic and topographical differences

Myanmar's climate is generally referred to as tropical monsoon. It has three seasons i.e: summer, raining season and winter. The country is bounded by mountains and hills in the west, north and east and the sea in the south and south – west. The innermost part stretches from delta regions in the south to very flat and dry area at the centre. There are regions which receive heavy rainfall (such as delta regions and hilly areas), while some areas receive only scanty rainfall. Again, coastal regions are subjected to frequent cyclones, while certain areas are subjected to earthquakes (though rarely exceeded 6 mm scale). These differences often impose difficult problems in trying to arrive at uniformity in needs for structures.

Type of structure in buildings

Type of structure varies from light bamboo huts and wooden houses to R.C.C buildings.
Traditionally and culturally Myanmar families generally prefer living in separate houses with its own compound and fence –be it bamboo huts or R.C.C structures except in big cities where there is mostly little choice but to live in apartment houses and flats or condominium due to its large populace.

In hilly and remote villages, people prefer living mostly in bamboo houses with thatched roofs. The main reasons are that construction materials are locally and readily available at low cost, no sophisticated design technology is needed, easy and not expensive to construct and maintain and above all, the buildings suit the local weather conditions.
In small towns, timber buildings with C.G.I roofing or brick-nogging buildings with A.C or tile roofing are rather popular.

In large towns, and cities, most of the old brick-noggin, timber or low rise R.C.C buildings (the tallest of which were only 6 stories high)

are now replaced by tall R.C.C or steel structures of well-over 10 stories. Yet residential buildings are mostly of 2- storey R.C.C structures with tiles or A.C roofing. The use of timber is still indispensable everywhere, especially more so in joinery and internal. Myanmar has a population density of only in the order of 200 per square mile and may be termed as very sparsely populated. As a result, there is no housing shortage whatsoever at all country wide.

Construction materials

Except steel, cement, aluminium and plastics, all other natural materials are readily available in large quantities and at low cost. For example, timber can be bought easily all through out the country. Apart from this, it is a renewable resource and wood processing requires only a low-energy operation. Myanmar is fortunate to have an abundant quantity of wood -even to the extent of exporting its surplus to various other countries.

Bricks are still widely used in almost all the residential buildings and even in development projects for walling and fencing. A small step forward in its development is that man-made bricks are now replaced by machine-made ones of better quality in terms of strength, durability and precise geometry. Myanmar so far has only 4 cement factories. It is not as yet sufficient to meet the high construction demand of the present day. As a consequence, plans are being made to establish more cement factories. Despite these efforts, Myanmar is still fulfilling part of its cement needs by importing from neighboring countries.

Technology and quality control

There are code of practices prescribed by Ministry of Construction in the areas of design, construction materials, quality control, acceptance norms, specifications etc. when it comes to construction. But when it comes to maintenance, prescribed rules are rarely made except that everything appears to be left to the whim and fancy of the engineer at hand. Some of the prevailing codes are also somewhat but not totally out-dated and therefore need to be amended every now and then along with the dynamic construction industry.

Design and construction undergo changes with reference to development taking place all over the world. So do construction materials. For example, in Myanmar, design techniques are in the period of transition to CAD, ultimate load design, limit-state design/plastic design etc. Even today, transition period is still going on and not yet ended. The encouraging light at the end of the not-totally-dark tunnel is that Myanmar Engineers Association is striving to improve along those lines, so that these technologies be not limited to a few professionals of the Ministry of Construction and some Engineering Institutions but to reach to the hands of other engineers working outside these organizations.

Regarding construction materials, steel was rarely used in the old days except in large factories and mills. Today, steel and prestressed concrete are being used in large and long span structures. Further more, various other materials such as Novopan, fibre glass RCC, pressed steel, PVC, aluminium, plastics etc. have come into the scenario of construction industry. Because labour cost is not expensive, Myanmar contractors prefer labour-intensive construction methods wherever machines can be avoidable. Although speed of construction and workmanship sometimes suffer, it pays in terms of economy and training experience of skilled workers in the long run. Solutions in developing an optimum combination of labour and machine have not been or cannot be as yet arrived at .

By looking at the still up-standing centuries old structures of the past (such as Shwedagon Pagoda), it seems that construction technology of these days must be quite appreciable. It is a pity that those know-hows disappear over time. The sad truth about it is also that no in-depth research into these areas has so far been carried out by any R&D of any organization.

In the context of quality control of materials, no special method is needed when it comes to timber work except by visual inspection and with minor instruments such as sprit level, plumb bob, ruler, set square etc. For other materials such as cement concrete, asphalt concrete, steel, stabilized materials etc, many laboratories with skilled technicians and testing equipment are emerging rapidly as quality awareness grows. The only drawback is that non-destructive testing equipment and methods are limited to a few laboratories only.

Future needs and proposed international collaboration

As mentioned earlier in Introduction, Myanmar is still lagging far behind in modern construction technology. However, it cannot stay stagnant forever and must give efforts to go level with the technology of the ever changing dynamic world. Almost all developing countries are in the development stage of construction in terms of technology, quality and quantity and Union of Myanmar is not an exception. The apparent drawbacks are also mostly common –technology, equipment, quality control, trained man-power, training grounds, research and development , international exposure and largely in financial capabilities. Not many of these individual countries can strive alone to make improvements in these areas. Regional and international co-operation, collaboration and assistance are required. By helping others, both the helping and the helped earn merits, at least both parties learn the experience of how to help and be helped. It will never be in vain.