



Faculty of Engineering University of Ruhuna



Examination Centre Battaramulla.

Photo Credit : State Engineering Corporation



Nation Building

The Architectural Achievements of the State Engineering Corporation

by Archt. Shereen Amendra

It is acknowledged that architecture is a reflection of the culture of a civilisation. However, the more distant such civilisations are, they appear wondrous to the beholders, seeing virtues which perhaps were never intended, while the architecture of the more recent times are seen critically. Whatever the case, in Sri Lanka there appears a window in time, of around 35 years, which is particularly significant in that many 'firsts' were achieved during a period following foreign rule. Sri Lankans themselves guided their own destiny in nation-building. Being fairly recent, this period is seen critically by many but perhaps in time to come, with the realisation of the challenges faced, the many wonders and breakthroughs, big and small, may be appreciated.

Innovation, creativity, trendsetting - all these aspects come to mind when considering the immense contribution to architecture by those who have served the State Engineering Corporation. The Corporation, or SEC as it was popularly known to the Construction Industry was set up in the 1960's. Staffed at that time by a young and dynamic team, in a burgeoning economic climate the challenges were formidable. Sri Lanka was 'finding its feet' economically, the focus shifting from an agriculturally based economy to industry. Better conditions for the people of the nation - housing, education, commerce, entertainment, health facilities and industries required that infra-structural projects were proposed along with the relevant buildings and complexes of buildings. The Consultancy

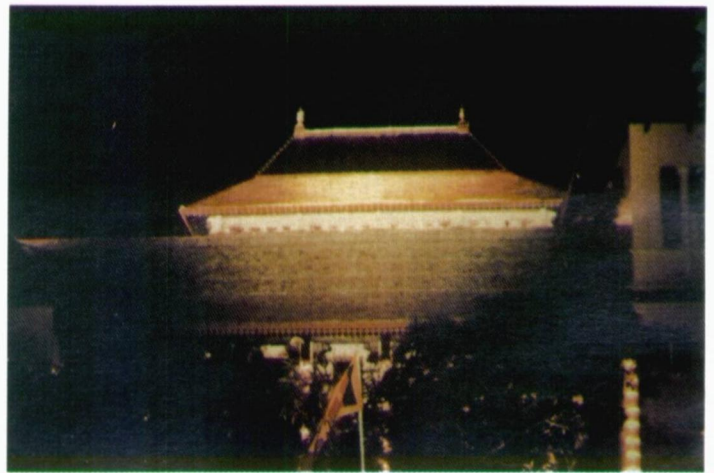
Divisions of the SEC provided consultancy services, while a major share of construction was carried out by the Construction Division.

With the Steel Factory at Oruwela being among the first commissions for construction the SEC was set up under the Ministry of Industries and Scientific Affairs. The Corporation undertook the construction of other industrial concerns realising through implementation, the policies of the Government which required industrialisation of a hitherto purely agricultural economy. Thus came into being the Plywood Factory at Kosgama, the Tyre Factory at Keleniya, buildings for the Milk Board at Welisara and Ambewala farm, Fertiliser Corporation warehousing and many more. They were combinations of the large, low-slung and proportionately long rectangular forms that factories usually are, resting comfortably in their respective landscapes, with their usually tall features (water tanks, storage silos and suchlike) towering in acceptable contrast. The designs of some of these buildings done in the early years of the Corporation were by private consultants. However, with the infusion of a young and dynamic team of architects into the Corporation the Architectural Consultancy Division burgeoned.

The early industrial buildings were made possible due to the enthusiasm of the professionals and leaders and not least the plant and equipment along with the necessary fleets of vehicles which made up the SEC. Previously, 'The Government Factory' appeared to be the institution that met the needs of heavy industry up to the time of establishment of the SEC. Private Construction Organisations, many of which were an arm of foreign-based firms, such as Colombo Commercial Co., Walkers etc. provided for the needs of the construction industry stemming from their establishment in support of the tea industry. However, the period of the 'tower crane', 'pre-cast' and 'prestressed concrete' and new approaches in



Kalutara Bodhi Stupa



Ran Viyana

engineering (lintee and spiro beams and slabs, T-slabs and so on) along with the supporting plant, equipment and manufacturing yards had a profound impact on the architectural possibilities. This was exploited to the fullest potential by the architects. While some designers saw the constraints of the structural system, each system in turn imposed its own discipline on the designs. Resultant buildings were high-rises, large-scale housing schemes and innovative auditoria. Educational buildings benefited too. The SEC was also the proud possessor of one of the first computers in Sri Lanka (circa 1970), which was used for engineering designs and management mainly, taking up an entire floor of the head office for its tape drives and punch card machines! State-of-the-art at the time!

In the cultural field the possession of the heavy plant and equipment along with innovation in engineering allowed the SEC to pay homage to religious facilities such as the Kalutara Bodhi Chaitya, the raising of the fallen Maligawila statue and the construction of the 'Ran-viyana' over the Sri Dalada Maligawa. When appreciating the beauty of picturesque scenes across many reservoirs of today the precursor to the Mahaweli Scheme, the construction of the Polgolla Barrage Dam should not be forgotten. This along with the Ukuwela Power House was also an SEC contribution in expertise, as was the Planetarium, the crown of which can be seen topping the trees in Colombo 7. This building along with the many others displayed the uninhibited use of pre-cast sections. The SEC also pioneered the use of slip-form concrete in Sri Lanka in the cement silos at Puttalam and the Flour Mill at Mutwal, buildings which stand out clearly in the landscape.

Thus, while the industrial buildings gave way to other types due to the availability of the plant, equipment

and methodologies to undertake large-scale works, the SEC, which until 1970 was under the purview of the Ministry of Industries and Scientific Affairs, was brought under the Ministry of Housing & Construction. Following 1970 and resulting from a Cabinet paper, all building construction work in government departments and government Corporations other than those works normally entrusted to the Buildings Department were to be entrusted to SEC. This State monopoly existed until the free market conditions following 1977.

The Architectural Consultancy Division was staffed by Senior Architects and architectural trainees with draughting staff and the supporting administrative personnel. The Architectural Division was also supported in consultancy services by engineers in the relevant other Divisions, namely, Structural Designs, Mechanical, Electrical etc. The infusion of a fair number of architects into the Architectural Division made it a fertile ground for -20 -innovative and creative architects in a most challenging climate.

The architects in their turn found it a suitable place to learn teamwork and interaction with other allied disciplines, so essential to the successful outcome of a building project. Many stories are told of situations where architects and engineers working on a project discuss together the possible solutions to the respective architectural and engineering design challenges towards achieving a common goal. In one such instance, a suggestion (from an engineer) that the pre-stressed T-beams could be hung instead of supported was eagerly accepted by the Project Architect incorporating into the design the beam off which the slabs were hung as the window sills and the slab formed by the T-beams as the sunshading/weather protection for the recessed windows. This can be appreciated today by any person passing by the SEC's own Headquarters office in Colombo 2. The quantity surveyor's delight at the saving in cladding costs can only be imagined. All this at a time when Sri Lanka had but the Ceylinco and Central Bank buildings to boast of as multi storey buildings.



Maligawatta Housing Scheme

Photo Credit - Prisantha Wijesinghe



Maligawatta Housing Scheme

Photo Credit : State Engineering Corporation



Manning Town Housing Scheme

Photo Credit : State Engineering Corporation

There were many other multi-storeyed buildings leaving the stamp of the State Engineering Corporation on Colombo's architectural profile. The earliest among these being the Labour Secretariat building at Narahenpita. In addition, the CWE Secretariat, Inland Revenue Office, Peoples Bank head office, NHDA building, Torrington Secretariat were some which changed the city's profile. These often proved to be the early landmarks of the city.

While challenging the hitherto low profile of Colombo by thrusting upwards at nodal locations of the City, all these high rises somewhat apologetically stressed the horizontal in their surface patterning. There was little choice in the structural system to be used and curtain walling was yet to be known in Sri Lanka which gave further reason for the horizontal patterning. The architects grappled with the need to move away from the single rectangular block and juxtaposed the unrelenting rectangular solid trying out differing heights one against the other in order to achieve some sense of shaping and form.

The character of the buildings stemmed from the innovative and imaginative use of the available pre-stressed structural systems, which were also relatively new to Sri Lanka. One such instance was highlighted in the SEC's own Head Office. The Torrington Secretariat building, so often seen as a backdrop to picturesque cricket grounds when matches are featured on TV embodies sunshades and weather protection of a different type.

It was charged that the 1.6 million sq. ft. of accommodation thus added to the growing city lacked 'human' spaces and brought in a 'new' and 'westernised' culture to Sri Lanka. The culture of technology over society. One cannot deny that the 3 dimensional profile (referred to as architectural topography by some) of the City which is much discussed today, in setting trends in urban design for the city was given a kick start by the City Offices and Secretariats designed and built by the SEC. The tallest building of the 1950's, the four-storeyed 'Times' building in the Fort was challenged by 'Ceylinco House' and the Central Bank building which were forerunners to the SEC buildings & served as a reference to the feeling of height if nothing else.

Many commercial establishments added to the variety of architecture already existing. The State Trading Corporation reflecting the horizontally of the Beira Lake, the Gem Corporation showrooms absorbed into the Central

Business District of Colombo and the sensitive form and shaping of the building for the Board of Investment in the outskirts of the city at Kelaniya at the Investment Promotion Zone (IPZ) at Biyagama. In similar vein at Battaramulla, the offices designed for the Petroleum Corporation are now occupied by IIMI.

These are only some of the many and varied buildings resulting from the design process. Each client's requirements were individually researched, analysed and evaluated against site conditions and discussions held with clients and the design team.

Not only work-place but residence too, was 'touched' by SEC, The Corporation's contribution to housing was immense. Here again, the structural systems used influenced design to a large extent. Prefabricated sections were widely used, including prefab wall components, clearly seen in the Rukmalgama Housing Scheme. There were many collaborations with foreign firms in these exercises - expertise from Korea, France, Yugoslavia and Russia.

Whether low-rise, medium-rise or eight floors tall a common factor considered by the architects was to provide for a high density in the residential population. This led to trendsetting in architectural research and many were the debates reflecting on the experiences of Milton Keynes housing, Chandhigar, East Asian housing and sacklike. Research was also carried out down residential byways in the city and suburbs. This gave rise, after much brainstorming and discussion, to the upper level 'street' of the Summit flats, the mid-level ramps of the 8-floor Maligawatte Housing Scheme and many other innovations at Crow Island and Raddolugama. Anderson flats and Soysapura housing at Ratmalana were some of the earliest housing schemes done when SEC was young. A most daunting challenge was met in accommodating 4 - 6 person families while constrained with a government regulation of 400 sq.ft. The architects used their skills and ineffectiveness to 'extend' this area while meeting the requirement.

The search for a sense of 'place' and a humanised environment with identity was ever present in the architect's thinking. The Summit flats, as it was popularly known, were maisonettes with an upper level street which was used when the 1973 NAM Summit was held in Colombo and is an example of 'saving the character of the surrounding environment' while providing a high density in housing. Once again the excellent teamwork and rapport with the engineers and site staff ensured

that the trees which formed much of the character of this site were all saved. The Manning Town Housing Scheme is a similar but more recent example.

Community aspects were addressed in the design of every housing scheme. Allied community facilities were provided after much debate and many housing schemes embodied community halls, shopping facilities, facility for religious activity and recreation along with the infra-structural requirements.

Educational establishments whether school or university benefited from the SEC's pre-cast structures, clothed, arranged and positioned on different sites according to the needs of each institution. The students of the Faculty of Architecture learnt their first lessons in the rear garden shade under the pre-cast pin-jointed R.C.C. frames which formed the studios at Ward Place (now the premises of the UGC). The sensitive cladding by the architects incorporating seats and sense of freedom in its setting undoubtedly influenced the quality of

architecture generated within. The Faculty moved to yet another SEC constructed building at Katubedda, of totally different architecture while still using pre-cast elements of a different type. The contrast in the architecture reiterates the great degree of flexibility possible to the architect within the discipline of the structure available. Traditional building methods in concrete and brick were not forgotten either, the existing Royal College Hall was given deference yet matched by the additional classrooms on a 3 floor building enhancing the total outlook and strengthening the character of the school's image. A wide variety of additions were made to Ananda and Nalanda Colleges. The variety of architecture in the sports pavilions, workshops, classrooms and auditoria each different to the other yet held together in a harmonious continuum. The number of schools boasting of classrooms under the fondly dubbed 'school frame' are too numerous to mention and are found all over the island each with their own inflections in architecture. The SEC did not rely only on these 'type' structural systems, as is seen in the Kotelawala Defence Academy buildings which uses traditional R.C.C. structures with



Institute of Advanced Technical Education at Laburwa.

Photo Credit : State Engineering Corporation



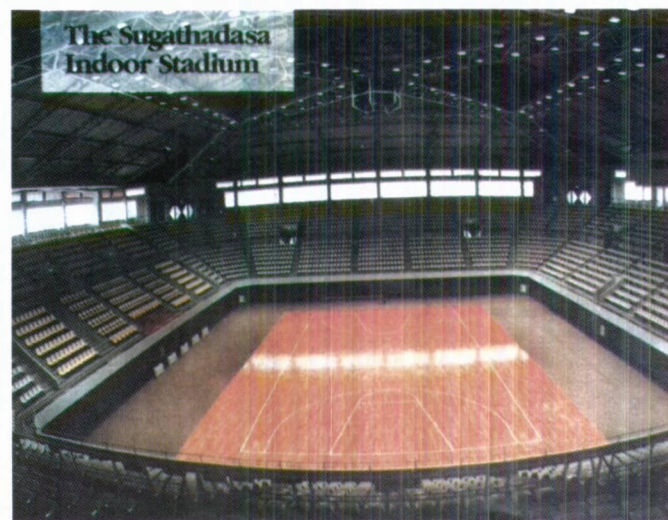
Institute of Advanced Technical Education at Labuduwa

Photo Credit : State Engineering Corporation

different architectural attitudes. The 'humanised' ambience of the environment created by the architecture of the Kindergarten section of Royal College underscores the wide variety of spatial qualities and the 'place-making' ability within the discipline of the SEC working environment. It was indeed unfortunate that the necessity to mitigate the baser qualities of humanity required provision of protection from vandals affecting the openness of the buildings. This too however, was provided by visually 'open' sliding steel panels with due consideration to the architecture.

The Universities and particularly the Colleges of Education country-wide have environments moulded by the SEC in the form of the Engineering Faculty for Ruhunu University at Hapugala, Galle and the Peradeniya Medical Faculty as well as Colleges of Education, Pasdun Korale and Hapitigama and the Labuduwa Advanced Technical Institute. Closer to the city at Battaramulla is the SEC's contribution in the form of the Examination Centre for the Department of Education. The resultant variety in architecture is a reflection of the functional needs, contextual factors and not least the designer's expertise.

Structures ancillary to sports are obvious owing to their sheer size and scale and the SEC's hallmark pre-cast structures with varying and appropriate architecture are found in the prestigious Board of Control for Cricket at the SSC Grounds, the Sugathadasa Stadium, the Sports Ministry Pavilion and buildings and elsewhere around Sri Lanka. The large spans and construction methodologies available along with the architectural expertise available with the SEC made these possible including the construction of the Khetarama Stadium.



Sugathadasa Stadium

Innovation in the use of materials and techniques became necessary especially in the 1970's where components or materials relying on foreign exchange were limited in use owing to the policies of the time. Thus, Sinha-ram stabilised earth blocks (styled on the Cinva-Ram of South America), straw-board, treated cadjan thatch, pebble-dash plastering, off-form concrete, glass trowelled cement coated slabs for counter tops came into being. Environmental considerations were not forgotten and hitherto used heavy 3" x 4" timber door and window frames were pared down by architects to slimmer proportions saving timber. Pivots were used on door and window sashes to save the use of frames, and many other ingenious devices were tested out keeping the Building Research Division of the Corporation busy. The constraint of not being able to import special materials was felt most in the design of specialised buildings such as studios and auditoria. Rough textured uneven surfaces were tried and tested in order to diffuse and dissipate sound, while hardboard was tediously drilled full of holes to form a composite sound diffuser. In another instance special double glazing to avoid sound transmission and standing waves between the panes had to be specially detailed. While these tedious home-grown details could have been had with a glance at a catalogue and a phone call, policy dictated otherwise. However, importantly, the benefit was to the architect who learnt hands-on, how principles are applied to achieve a technically and architecturally correct solution to the best of their ability! In the 1980's the people of Sri Lanka in the remotest regions were given the opportunity of appreciating second-hand some of the wonders of the island when the SEC was called upon to recreate miniatures of some buildings and features during the 'Gam Udawa' programme or village enlightenment as the term signifies. Yet this was inadequate to signify the range and scope of contributions of the Corporation nationwide.

The volume of building in quantitative terms is as vast as it is varied qualitatively, including highly technical complexes of buildings such as the Sound Studios of the

National Film Corporation for the cinema industry, community related buildings, the Public Library for Colombo City, buildings for the Defence Forces and so on. The architecture ranges from the simple to the most complex, from mundane to exquisitely sensitive, from low-profile and humanised to the monolithic forms of silos and industrial buildings. None of these, however, can ever be termed an architectural aberration or a blot on the landscape. This may well be attributed to the team-spirit of the professionals whose individual character may be reflected in the architecture but never their ego's if ever they had one.

In some instances owing to circumstance, a project may have taken many months or years to fruition, thus the concept formulated by the architect originating the design may be subsequently developed by other architects. This situation prevailed at a stage when many architects sought prospects abroad. A feature of the working environment of the Architectural Division being the work (or design) ethic where a concept was respected and developed. This attitude of respect for fellow architects and the ability to work as a team allowed such projects to be realised as a harmonious whole. Presently, a project is carried through from inception to realisation as a joint collaboration of architects with a similar respect of views. This attitude provides an opportunity to those architects nurtured by the SEC to learn conduct in matters of courtesy and positive professional ethics and maintain a high professional standard. In office practice too, documentation was streamlined through constant review of the processes involved. The smooth functioning of the office and the realisation of projects were due to systems introduced by the professionals in each of the Divisions of the SEC including the Architectural Division.

It must also be mentioned that the support the professionals received from new thinking in management consolidated the professional freedom to design, as each Division enjoyed a fair degree of autonomy within the totality that was the Sri Lanka State Engineering Corporation.