Turf War on a Building Project

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He is the editor and an author of *Buildings That Shaped Bombay: Works of G.B.Mhatre*. He has co- authored *Four From the Fifties- Emerging Modern Architecture in Bombay as well as Build A Safe House With Confined Masonry.* His latest book, *BoOmbay: From Precincts To Sprawl* recreates the city's genealogy through its built form and spaces. He has been associated with teaching at various schools of architecture. He has been on jury panels for several public competitions.

In the present essay, Kamu Iyer joins the discussion on the often fraught relationship between an engineer and an architect in a building project. The essay is written in response to and in extension to the Practice essay published in Tekton, volume 3, issue 1, March 2016 - "Running a Structural Engineering Practice", by Alpa Sheth, a noted structural engineer from Bombay.

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In her essay, "Running a Structural Engineering Practice", published in Tekton, volume 3, issue 1, Alpa Sheth has raised some pertinent questions to ponder over. In this essay, I attempt to discuss a few of them. She starts by wondering if the state of practice today has reduced the role of the structural engineer to that of a technician. One can say that the roles of the architect and the structural engineer in a project are only vaguely defined as are also the different aspects of a project. The architectural design and its details, the civil engineering and its specialised structural design aspects overlap so much that the lines between them are blurred. This brings about some ambiguity in responsibilities, share of credit or discredit and professional charges for each member of the team. Architects take the lion's share of the credit, acknowledging, often grudgingly, the part played by other members of the team.

Is this a present day phenomenon or was it so from the time an architect was brought in to design more than just the facade of a building? In India, the architect as a professional came with the British. Till then the master builder designed and constructed the building. He knew the materials he worked with, their properties and potential. Buildings, even public ones, were built with load bearing walls, wood joists and boarding or stone slabs. The British introduced cast iron columns, steel joists and jack arch floors or brick vaults. Buildings constructed in the late nineteenth and early twentieth centuries were mostly designed by engineers who had a sense of architectural design. Likewise, architects had sufficient knowledge of structure and behaviour of materials to enable them, in small buildings, to size structural members. Often they depended on the wide experience of the builder.

Why is there a Dichotomy?

Engineers then were trained in many aspects of civil engineering, which along with structural design of buildings included architectural design and drawing. The training was comprehensive and a student was exposed to a wide range of engineering issues. Likewise, architects were exposed to engineering aspects of building. The Public Works Department (PWD) in British times standardised and codified construction practices. "PWD Handbook" compiled by Capt. Fredrick Marryat was the first manual for reference by architects, engineers and students of architecture. But the handbook, in two volumes, did not include structural design as a separate section because it was not a specialised branch of civil engineering. It was as important as construction and its code of practice. After Independence, P.N. Khanna, in his almost encyclopaedic handbook of civil engineering, added a section on design of RCC structures. With RCC becoming the most preferred system of constructing the shell of a building, the structural engineer arrived as a specialist leaving the other engineering functions to be fulfilled by either the architect himself or other specialists appointed for the project. The edges between the architect's role and that of the structural engineer was being drawn, subtly in the beginning and harder later. One was a generalist while the other a specialist and both, needlessly, looked at projects through their own prisms. The dichotomy was entirely perceptual.

After all, both deal with the same things- order, harmony and proportion, principles that are abstract and yet real. Pier Luigi Nervi, in a lecture at the Institute of Engineers in 1959 said, "Design and proportion comes first. Maths comes after and that too for checking what you have done." H.G. Mahendra, a civil engineer of an earlier

generation, used to tell architects with whom he was associated in projects, that proportion was his concern too. He would say that the correctness of a structure would show in its proportions also. In other words, a structure has not only to be right; it also has to look right. It's only then that it works. What this engineer was saying found an echo in the words of a professor who told his students at the Sir J. J. School of Architecture, " Only a building that satisfies the mind and the eye can aspire to qualify as architecture." The similarity in the conceptions of both shows that there was no difference fundamentally.

So, as Alpa Sheth writes, a project, for a structural engineer, is as much a voyage of discovery as it is for an architect. For he or she too, like the architect is looking beneath the obvious. The engineer looks at the forces that have shaped the structure and at how the components behave, while the architect reflects on the spaces created, the elements that gave them form and how they work for the people he has designed them for. Both are looking for a deeper meaning in their work. Yet they lock horns without seeing what the real difference between them is. The architect, who starts with introspection into the nature of a programme, tries to achieve, through tangible means, a design that in the end evokes qualities that are immeasurable. The engineer deals only with tangibles. Even stresses and strains, forces and natural phenomena that he works with are quantifiable. His education is science based which dismisses intangibles as mere dreams. This, among others, could also be a reason for the engineer wanting to work directly for a client who, he thinks, understands better the rationality of his work and appreciates its importance, more than the architect does.

Looking Back in the Past

To understand the cause of this mistrust, we need to look back at the time when the architect was a mere beautifier. Then buildings were either builder driven or engineer monitored. Both used either an architectural draftsman or architect to design the facade and architectural details of the interior. Many buildings were thus built in Bombay. The architect was considered to be a mere beautifier performing only a superficial function and therefore dispensable. When he was entrusted with more responsibilities and put in charge of a project, the engineer who considered the architect a dreamer, suddenly found him a poacher. The engineer thought it was the rare architect who used his head and the architect, now in a more serious role, said it was difficult to find an engineer with imagination. The disdain was mutual. The Builder who delivered a building using an architect and engineer as service providers to him, resented dilution of his hold over a client. That was the beginning of a turf war that prevails in some form or other even today.

Questions on Accountability

It raises some important questions. Who is in charge of a project and who is accountable to whom? Are the members of a project team responsible for failure of their part of the project? Is accountability individual or joint?

These have not been answered satisfactorily so far despite several legal suits being filed against architects and engineers for some failure or the other. These have seldom been resolved because a failure is either due to a design fault or defective construction. Both are disputable and it is difficult to pinpoint a fault. Structural and engineering designs generally follow codes and err on the safe side. Moreover software eliminates

fallibility to a great extent. Construction defects, unless they end in loss of life, and that too due to gross negligence, get condoned with penalties. PWD contracts in the British rule were loaded against the contractor. They were one sided where all responsibility for failure either due to design or construction was of the contractor. That was during the colonial rule. Alpa Sheth mentions two instances where the structural engineers rectified, at their cost, design flaws that were noticed after the work was completed. These were voluntary responses to a sense of professional obligation to a client. They were commendable but exceptions to the attitude of burying ones head in the sand, generally taken by professionals employed in building projects.

The Changing Nature of Building Practice

Architectural practice today has become complex. Most projects have a plethora of specialists working on them. Even small buildings need the services of more than one consultant. This contrasts with practices of the past where even large projects were done with small teams. A structural engineer was an inseparable part of a team while services for electrical, air conditioning and plumbing were provided by specialised contractors or vendors who offered design services as a part of their tender. Structural designs were either paid for by the client or included as a separate item in the tender and the contractor paid for it. This had the approval of the client and adopted in small projects. Architects and engineers were trained to understand each other's work and it was natural for an architect to lead a team because being a generalist he did not have a blinkered view of things. That way, his experience of a project was more complete. The size of a project seldom mattered and even the large practices comprised of big and small projects. Offices did not allocate specific man hours to a project nor was there a concept of monitoring internal office costs and relating them to the fee received. In the large practices, projects big or small, got attention from the principals of the firm.

The nature of practice for all professionals working on building projects has changed. It is increasingly competitive, commercially driven and strictly time bound. The big projects aspire to conform to a 'global image' that is a reflection of a consumerist culture. The corporate, developers, even the Government are driven by what they assume is globally accepted. This is identified with the "idiot glass box" and the characterless high rise buildings with nothing to boast of but their height.

Way Forward

In such a competitive ecosystem, how is a project to be done? Does an architect's education today equip him to give a vision to a project and lead a team of consultants skilled in their fields of specialisation, leaving them to give their best? Are engineers trained to see more than only their part of the project and understand the larger picture which the architect has drawn up?

The answer to both the above lies in the prevailing system of education. Alpa Sheth bemoans the decline of civil engineering as a programme preferred by students. Engineering education in India which started with colleges in Madras and Roorkee were designed to train subordinate engineers for major projects undertaken by the PWD. They were trained only to provide assistance to British engineers at a middle level. Today, barring the IITs and other such institutions, the education meted out at

most engineering colleges is similar to the "upper subordinate" level given by the early colleges set up by the British. It is barely sufficient to enable a student to either work at a site or in an office, but not as a creative designer. This could be improved with more exposure to computer software and greater interaction with faculty members. As Alpa Sheth regretfully adds, students are not trained to make presentations which could help them put across their ideas with clarity. With shortcomings in their education, engineers cannot be blamed if they do not look beyond their part of the project.

Architects, who were initially trained as draftsmen to assist British architects, have gone a bit further in their education. Because of their exposure to Arts and Humanities, they can provide a broader vision but their role as leaders needs adequate knowledge to appreciate what the other team members bring to a project. Most schools of architecture do not go beyond providing few skills and knowledge to get by in an office, not enough to lead a team. Schools have, therefore, to reorient their pedagogy so that students are exposed to what precedes a project, why it needs to be done and how it is to be done. And that an addition to the built environment comes from the effort of many, not just the architect, though it is he who gives the vision and leads the team to its fulfillment. ■