BUILDING DETAILS

Functional Use of Materials

In the earliest civilisations, building form was dictated by the techniques of binding, knotting, tying, plaiting and weaving. Building in timber followed later, and in nearly all civilisations became the basis for architectural form (see the example of the Greek temple - ① and ②).

Recognition of this is relatively recent, but there is an increasing number of examples which support the accuracy of this theory. Uhde researched this matter at length and established that Moorish architectural skills originate from timber construction, in particular the Alhambra at Granada. The internal surface decor of Moorish buildings has its source in weaving techniques (like the ribbons and beaded astragals on Greek buildings), although it was actually pressed into the gypsum by moulds or inlaid as 'Azulejos' (glazed strips of clay). In several rooms of the Alcazar in Seville one can clearly see in the corners of the rooms the knotting together of the walls in the gypsum finish exactly in the way that the wall carpets of the tents were knotted at the corners in earlier centuries. Here the form derived from tent construction was simply transferred to the gypsum mould.

Under the same conditions, forms which result from the material, construction and functional requirements are similar or even identical in every country and time.

The 'eternal form' was traced by V. Wernin with convincing examples. He showed that utensils used in the Far East and in Europe in 3000 BC are strikingly similar to those in use today. With new material, new technology and changing use, a different form inevitably evolves, even though embellishments can obscure or conceal the true form, or even give the impression of something quite different (baroque). The spirit of the age tends to decide the form of the building.

Today, in the buildings of other periods, we study not so much the result as the origin of the art. Each style arrives at its 'eternal form', its true culmination, after which it is developed and refined. We still strive after a true expression with our use of concrete, steel and glass. We have achieved success in finding some new and convincing solutions for factories and monumental buildings, in which the need for extensive window areas determines and expresses the structure.

The plain and distinct representation of the building parts, in conformity with their technical functions, provides possibilities for new forms in the details and the outward expression of buildings. Herein lies the new challenge for architects today. It is wrong to believe that our age needs only to develop clean technological solutions and leave it to the next period to cultivate a new form emanating from these structures -②. On the contrary, every architect has the duty to harness contemporary technical possibilities extensively and to exploit their artistic potential to create buildings that express the ethos of the modern world (①, p. 39). This requires tact, restraint, respect for the surroundings, organic unity of building, space and construction, and a harmonious relationship between the articulation of interior spaces and the exterior form, in addition to fulfilling technological, organisational and economic demands. Even major artists with true creative drive ('those who have something to say') are subject to these restrictions and are influenced by the spirit of the age.

The clearer the artistic vision or the view of life of the artist, the more mature and rich the content of his work, and the longer it will endure as a beautiful object of true art for all time.
To begin with, it is always construction that is the basis of form. Later it develops onto a pure, and often abstract form, which is initially adopted when new building materials are introduced. Numerous examples of this can be found in history, from ancient stone tombs, in which even the lay observer can discern the basic timber form, to the automobile of 1900 that imitated the horse-drawn carriage (even down to the provision of a whip holder).
STEEL

Slender supports give steel-framed construction the lightest possible appearance. However, this form is not permitted everywhere. Exterior unenclosed supports are rarely allowed, but, if combined with externally visible horizontal girders, can create an especially light but solid appearance of unobstructed space. Steel and aluminium structures are particularly suitable for light open halls with few supports and cantilevered roofs.

REINFORCED CONCRETE

For many building types, building regulations require fire resistant or even fireproof construction and encased steel members consequently resemble reinforced concrete.

SHELL ROOFS

In shell structures, forces are distributed uniformly in all directions. Types include: cupola with segments, oblong, rhythmically arranged transverse shells, rows of shells with inclined supports at neutral points.

CABLE STRUCTURES

Cable structures for long spans have been in use since early times. Circus tents are the best-known lightweight suspended diaphragm structures. Modern reinforced concrete suspended diaphragms with rigid edge beams can create economical and impressive buildings, and may be used as basis for cantilever constructions.

The latest fire protection techniques can obviate the need for concrete encasement altogether. Intumescent coatings are often used for protecting structural steelwork against fire (especially the visually expressed elements). These look like normal paint but, in the event of fire, they foam, thus creating a protective layer around the steel.
In the time between the beginning of the 18th century (the period of witch-hunts, superstition, leaded lights and fort-like houses, a form which is still occasionally in demand) and the present day, astonishing advances have been made in science, technology and industry. As a result the outlook of society has changed radically. In the intervening centuries it is clearly evident from buildings and their details, as well as other aspects of life, that people have become freer and more self-aware, and their buildings lighter and brighter. The house today is no longer perceived as a fortress offering protection against enemies, robbers or 'demons' but rather as a complementary framework for our way of life – open to nature and yet in every respect protected against its inclemency.

People generally see and feel things differently. Designers must therefore use their creativity as far as possible to translate our shared experience into reality and express it through the materials at their disposal. The attitude of the client is of the greatest significance in this issue. In some ways, many clients and architects are still living in the 15th century while few of each have arrived in the new millennium. If the ‘centuries’ meet in the right way, then a happy marriage between client and architect is assured.
The sketch scheme is begun by drawing up individual rooms of the required areas as simple rectangles drawn to scale and put provisionally into groups. After studying the movements of the people and goods (horizontally and vertically), analyse circulation and the relationships of rooms to each other and the sun – p. 272. During this stage the designer will progressively obtain a clearer understanding of the design problems involved. Instead of starting to design at this stage they should, on the basis of their previous work to establish the building area, determine the position of the building on the site, by exploring the various means of access, the prevailing wind, tree growth, contours, aspect, and neighbourhood. Try out several solutions to explore all possibilities – 1) and use their pros and cons for a searching examination – unless of course a single obvious solution presents itself. Based on the foregoing, decision-making is normally fairly quick, and the ‘idea’ becomes clearer; then the real picture of the building emerges – 2).

Now the first design stage can begin, firstly as an organisational and spiritual impression in the mind. From this, a schematic representation of the general configuration of the building and its spatial atmosphere is built up, from which the designer can develop the real proposal, in the form of plans and elevations. Depending upon temperament and drawing ability a quick charcoal sketch, or a spidery doodle, forms the first tangible result of this ‘birth’.

The first impetus may become lost if the efforts of assistants are clumsy. With growing experience and maturity, the clarity of the mental image improves, allowing it to be communicated more easily. Older, mature architects are often able to draw up a final design in freehand, correctly dimensioned and detailed. Some refined mature works are created this way, but the verve of their earlier work is often lacking.

After completion of the preliminary design, 3), a pause of 3–14 days is recommended, because it provides a distancing from the design and lets shortcomings reveal themselves more clearly. It also often dispenses with assumptions, because in the intervening time preconceived ideas are put aside, not least as a result of discussions with staff and clients. Then the detailed design of the project is begun with the assistance of various consultants (e.g. a structural engineer, service engineers for heating, water and electricity) firmly establishing the construction and installations.

Following this, but usually before, the plans are submitted to the relevant authorities for examination and permission (which might take about 3–6 months). During this time the costs are estimated and specification and Bill of Quantities produced, and the tendering procedure is undertaken, so that as soon as the permission to proceed is received, contracts can be granted and the work on site commenced.

All these activities, from receiving the commission to the start of building operations for a medium-sized family house, takes on average 2–3 months of the architect’s time; for larger projects (hospitals, etc.) 6–12 months should be allowed. It is not advisable to try to make savings at this juncture; the extra time spent is soon recovered during building operations if the preparation has been thoroughly carried out. The client thus saves money and mortgage interest payments. The questionnaire (– pp. 41 and 42) and the room specification folder (– p. 31) will be important aids.
BUILDING DESIGN

Preparatory Work: Collaboration with Client

Preparatory work is often done in a rush, resulting in an insufficiently detailed scheme being put out to tender and commenced on site. This is how ‘final’ drawings and costs only become available when the building is nearly complete. Explanations are of no help to the client. The only way of solving the problem is faster and better organised work by the architect and sufficient preparation in the design office and on the construction site.

Similar information is required for most building projects, so detailed questionnaires and pro forms, available when the commission is received, can be used to speed things up. Certainly there will be some variations, but many factors are common and make questionnaires useful to all those involved in the project, even if they are only used as checklists.

The following questionnaire is only one of the labour saving pro forms which an efficient and well-run architect’s office should have available, along with pro forms for costing purposes, etc.

Briefing Questionnaire

Commission No.: .............................................................................................................

Employer: ..............................................................................................................................

Project Description: ............................................................................................................

Information collected by: ...........................................................................................................

Copies to: ...............................................................................................................................

I Information on the client

1 What is their financial status?  Business outlook? Total capital employed? confidential
2 How does the business seem to be conducted?
3 Who is our main contact? Who is our contact in his absence? Who has the final authority?
4 Has the client any special requests regarding design?
5 Have they any special interest in art? (In particular with regard to our attitude and design method.)
6 What personal views of the client need to be taken into account?
7 Who is liable to cause us difficulties and why? What could be the effects?
8 Is the customer interested in publication of his building later on?
9 Do the drawings have to be capable of being understood by laymen?
10 Who was the client’s architect previously?
11 For what reason did he or she not receive this commission?
12 Is the client thinking of further buildings? If so, when, what type, how large? Have they already been designed? Is there the possibility that we might obtain this commission? What steps have been taken in this direction? With what success?

II Agreements on fees

1 On what agreement with the client are the conditions of engagement and scale of professional charges based?
2 What stages of the work are included in the commission?
3 Is the estimated project cost the basis for the fee calculation?
4 What is the estimated project cost?
5 Are we commissioned to carry out the interior design?
6 Has a form of agreement between employer and architect been signed and exchanged?

III Persons and firms involved in the project

1 With whom do we have to conduct preliminary discussions?
2 Who is responsible for what special areas of activity?
3 Who is responsible for checking the invoices?
4 Which system of ordering and checking will be used?
5 Will we have authority to grant contracts in the name of the client? If so, to what value? Do we have written confirmation for this? Who does the client recommend as contractor or sub-contractor? (Trade; Name; Address; Telephone)

6 Is a clerk of works essential or merely desirable, and should he or she be experienced or junior? When is he or she required, and for how long (duration of job or only part)?
7 Have we explained duties and position of clerk of works to client?
8 Is accommodation available for site offices and material storage? What about furniture, telephone, computers, fax, heating, lighting, WC and water?

IV General

1 Is hoarding required? Can it be let for advertising? Is signboard required and, if so, what will be on it?
2 Exact address of the new building and name after completion?
3 Nearest railway station?
4 Postal district/town?
5 Is there a telephone on site, and if not when will one be available? Alternatively is there a telephone in the vicinity?
6 Have we obtained a local edition of the national working rules for the building industry? Are there any additional clauses?

V The project

1 Who has drawn up the building programme? Is it exhaustive or has it to be supplemented by us or others? Has the client to agree again before the design work starts?
2 Has the new building to be related to existing and future buildings?
3 Which local regulations have to be observed? Who is building inspector or district surveyor? Who is town planning officer?
4 What special literature is available on this type of building? What do we have in our files?
5 Where have similar buildings been built?
6 Have we taken steps to view them?

VI Basic design factors

1 What are the surroundings like? Are landscaping and trees to be considered? What about climate, aspect, access, and prevailing wind?
2 What is the architecture of existing buildings? What materials were employed?
3 Do we have photographs of neighbourhood with viewpoints marked on plan? If not, have they been ordered?
4 What other factors have to be considered in our design?
5 What are the existing floor-to-floor heights and heights of buildings? What is the situation with regard to roads, building lines, future roads, trees (types and sizes)?
6 What future development has to be considered?
7 Is it desirable to plan an area layout?
8 Are there regulations or restrictions concerning elevational treatment in district?
9 What is known of attitude of town planning officer or committee towards architecture? Is it advisable to discuss initial sketches with town planning officer before proceeding?
10 In case of appeal, is anything known of the time taken and the ministry’s decision in similar cases in this district?
VII Technical fact finding
1. What sort of subsoil is common to this area?
2. Has the site been explored? Where have trial holes been sunk? What were the results?
3. What is load-bearing capacity of subsoil?
4. Average ground water level? High water level?
5. Has the site been built on previously? Type of buildings? How many storeys? Was there a basement and, if so, how deep?
6. What type of foundation appears to be suitable?
7. What type of construction is envisaged?
   In detail:
   Ground floor: Type? Applied load? Type of load? Finishes?
   Other floors: Type? Applied load? Type of load? Finishes?
   Internal or external downpipes?
9. Type of supports? Outer walls? Partitions?
10. Staircase structure? Applied load?
13. Type of heating: solid fuel/gas/electricity/oil? Fuel storage?
15. Ventilation: air conditioning? Type? Air change? In which rooms? Fume extraction? Smoke extraction?
16. Cooling plant? Ice making?
17. Water supply? Nominal diameter of supply pipe and pressure? Is pressure constant? Water price per cubic metre or water rate? Stand pipes required? Where and how many?
23. What type of lift? Maximum load? Speed? Motor at top or bottom?
26. Any additional requirements?