

Sweden—A short conspectus of its Building Practice and Industry

by E R Skoyles FRICS (Fellow)

SUMMARY

Sweden is a country with a relatively small building market although it is the largest one in Scandinavia. The architect is principally responsible for design and technical accountancy but the measurements are undertaken by technicians, and general contractors have now nearly replaced the craft trades which formerly dominated the industry.

About 60% of this market is divided equally between turnkey and separate trades contracts. Sweden is noted for its excellent labour relations and is the originator of the Ackord (or piece rate) system which is the result of amicable collective bargaining.

THE BACKGROUND

Sweden is a sparsely populated country. 65% of the land area is mountainous, 25% forest and only about 8% cultivated land. Of the population of just over 9 million people (living in a land area of 411,479 km²) the majority live in the south where, excluding the cities of Stockholm and Gothenburg (Göteborg), the population density averages 29 inhabitants per km². It is not surprising that the majority of the population lives in the south because of the wide range of temperatures from plus 30°C in the south to minus 40°C in some of the northern highlands. The country is a constitutional democracy and is divided into 24 counties, (Lan).

THE BUILDING MARKET

Construction in Sweden accounts for about 15% of the nation's gross national product. In terms of national output Sweden is the most affluent country in Europe and its previously high GNP has increased in recent years. The investment in the construction industry has steadily increased in Scandinavia but Sweden's output is behind that of Denmark and Norway. The building market is progressive and it has high standards and although the country imports high quality products it also has a strong manufacturing industry. Sweden, like its Scandinavian partners, (Norway, Denmark, Finland and Iceland) belongs to the Nordic Building Conference.

The building market employs 10% of the working population and, excluding maintenance and civil engineering work, about 60% of the input is spent in the housing sector. Due to Sweden's low level of unemployment, about 1.5% of the workforce, the construction industry has a greater number of 'regular' employees and is not subject to fluctuations in work load due to political and economic dictates. However, due to recent devaluation of the Swedish Kroner (to 18% total devaluation in under a year) this may change if the expected rise in unemployment occurs this winter. Due to very high wages, labour costs are considerably more than in the U.K. The new building rate is much higher than in the other Western countries, i.e., 14 new dwellings per thousand inhabitants compared to 6 in the U.K., and 7 in the U.S.A. About 50% of the building work is in the private sector, although some of this sector is indirectly government subsidised.

The central authority for supervision and co-ordination of planning is the National Board of Urban Planning

(Statens Planverk). The County Municipal Designers serve both the Board and the County administration but are responsible to the Board and also assist the local authorities (Communes). The body responsible for construction and administration of building for the public sector is the National Board of Public Buildings (Byggnadsstyrelsen). The construction process involves a large number of independent consultants and the larger development companies and firms of contractors also employ their own consultant architects and construction engineers.

Building activity is governed by regulations administered under two forms of control:

(1) The Building Ordinance (SFS 1959:612) which covers: general requirements regarding safety, hygiene and comfort; application for building permits (which are granted by local building committees); regulations regarding the continuous supervision by qualified persons, who are officially responsible for the projects; and the duty of local building committees to inspect the operations and the finished building after practical completion.

(2) The Building Regulations (Svensk byggnorm) plus amendments, comprise rates governing the enforcement of building ordinance containing: Statutory regulations (which are binding for both builder and building committee and include testing and calculations); 'advisory remarks' (which are not binding) but good practice will eliminate the solutions which comply with the requirements set out in the statute.

The local building committee issues building permits and the regional—county administration—acts as an appeals forum. Standardisation in the building sector is undertaken by the Building Standardisation Committee and for housing the National Swedish Housing Board publishes 'Godbostad' (Good Housing), which while not strictly building regulations, provides a code for building.

THE HOUSING MARKET

Although Sweden has not been involved in warfare for many years like the rest of the European countries, the country has suffered a severe housing shortage due to population trends (i.e. increase and movements) and hence the housing policy is frequently a political issue. This shortage of dwellings started with the sharp rise of population, due to migration about one hundred years

Delays and the Architect

The important point to note here is that all the contractor must do is notify the architect, but that notification must be in writing. Having done that the contractor has discharged his obligation and the architect cannot contend at the end of the contract that the contractor failed to furnish details or state the extent of his delay, because this is the architect's responsibility.

We feel quite certain that a number of contractors do not send these formal letters to architects for fear of upsetting an officer to the contract who is in a position to make life difficult for them or to prejudice their chances of getting work from the architect. We would suggest that these fears are unfounded; the architect will be satisfied provided the contractor complies with the requirements of the contract which the architect's employer, the building owner, has selected to use for the particular project.

Recording Delays and Information

One very easy way of recording two of the items listed as items giving the contractor entitlement to an extension of time is for these to be recorded at every regular site meeting.

The particular causes for extension of time to which we refer are those of "awaiting information" and the "exceptionally inclement weather". It is suggested that an item should be put into the site minutes of every site meeting under the headings of "Delays Incurred by Inclement Weather" and "Information Awaited from Architect" and, to be fair, it might be advisable also to have a third heading which could be entitled "Information awaited from Contractor". It is suggested that the headings should be incorporated into the minutes regardless of whether the entry under these headings would be "NIL", the reason being that at a later time in the contract to look back and see such entries is informative in itself – every picture tells a story.

Site Minutes

It will therefore be noted that we consider that these have a very important function to perform in the contract. It is not just sufficient for the architect to visit the site regularly each week or when requested by the contractor to sort out a problem, and leave the site. We contend that formal site meetings, with minutes confirming the events since the previous site meeting, play a valuable role in ascertaining at the end of the contract the events that have occurred during that contract, e.g. whether the contractor was on programme or when he was delayed and the cause of those delays, or whether he was held up for information and when those events occurred. It is also possible to detect whether he could have been executing other work or whether he was at a standstill if he was awaiting information.

We would therefore suggest as an item of efficiency, that regular formal site meetings with minutes taken to a standard format are vitally important in the smooth running of the contract and create an amicable atmosphere between the parties involved in that contract rather than the contrary.

The meetings *should be small* (and therefore effective), just the architect and contractor's representatives, possibly the quantity surveyor (when the subject matter is relevant) and also relevant sub-contractors' representatives, only present however for the duration that their work is discussed.

Site Instructions

Whether receiving instructions from the architect or giving instructions to the sub-contractor, the contract is quite conclusive that those instructions given verbally, shall be confirmed in writing as the condition precedent to payment. Unfortunately many contractors fail to do this; again perhaps from an attitude of not wishing to antagonise the architect in continual confirmation; most architects, we are sure, welcome a contractor who complies with the contract as this avoids disputes at a later date and also avoids any animosity which could occur if there is a dispute regarding the precise nature of the verbal instruction that was not confirmed.

THE COST

Final Recovery

The ability of the contractor's surveying staff to maximise the recovery of costs is only as good as the documentation generated by the site staff. No matter how highly qualified a surveyor may be he cannot write with his hands tied behind his back!

It is, however, in the surveyor's interest to ensure sufficient liaison with the contracts managers to avoid that problem occurring. Upper management should ensure, by company policy, that this liaison exists at *all* levels, and this we cannot stress too strongly.

Our Final Conclusions as Consultants

Professional quantity surveyors during the normal course of their duty, particularly in the post-contract field, are continually made aware of the shortcomings of the contractor's organisation, with particular reference to the documentation. Equally, by the very nature of their profession, the Contractor's surveyors with their intimate knowledge of the contract and their practical knowledge of building construction, are ideally suited to assist the contracts manager to ensure that the project is not only built, and on time, but that he is able to recover the contractor's full financial entitlement. Unfortunately contracts managers often seem reluctant to ask for such assistance, or the contractor's policy does not encourage such liaison. In either event the result is the same – reduced efficiency and lower financial recovery.

THE ROLE OF THE QUANTITY SURVEYOR is changing and we consider, and have found from our experience, that the more experienced and senior surveyor is ideally suited, from his broad knowledge and almost inevitable contact with all departments, to investigate and comment upon the efficiency of his contracting organisation. Unfortunately his comments are often restrained and his voice muffled when the areas of inefficiency are revealed, as often this requires criticism of the parties which sign his monthly pay cheque! Most forward thinking and outward looking companies welcome constructive criticism, although having considered it they may, for other external considerations, reject it. Any constructive suggestions that can be made, should be made, as any company can only be as good as the staff it employs.

The Country needs an efficient building industry; the building industry must be efficient to survive. In the present small market, efficiency is an essential ingredient to survival. Streamlining and development of a system, which must be the *right* system, will provide the solid foundation on which the future expansion, which will surely come, can be built.

ago particularly from urban areas in the northern part of the country. Hence housing has to be produced on a very large scale in the southern area, especially around Stockholm and Gothenburg.

Since the last major European war (1939-1945), Sweden has attempted to rationalise its housing industry, particularly by standardisation of measurements (generic sizes) and simplification in the number and variety of building types.

Industrialised building has been introduced to reduce building time; this has increased the size of building contracts to gain the advantages of large scale production.

Sweden is one of the leading countries in number of dwellings produced per thousand inhabitants. Sweden has a National Housing Board (Bostadsstyrelsen) which is the central administrative authority for the promotion for housing construction. The principal function is to assist in directing the financing of housing with loans and grants. The housing market is divided among four different types of developer:—the state, local authorities and county councils; non profit-making housing companies; co-operatives; and private investors. The local authorities are the largest category of developers, investing about 47% of ordinary investments in building and civil engineering works. The private sector is responsible for about 41%. The balance is for state owned enterprises and public works. The non profit making housing companies are responsible for most housing construction in the low-rise flat market, but the co-operative sector comprises two organisations which, operating on a national scale, also includes other types of dwellings, e.g. brick houses.

DESIGN AND BUILDING

As in other European countries the design of buildings is predominantly in the province of the architects (Arkitekt), who have their own professional rules with fee scales, and who belong to a professional body, the Swedish Association of Architects (SAR). The architects organise the design, prepare working drawings but do not always supervise the works. Architects can qualify through University after a four or five year course, which includes four months practical experience required as a sandwich, or alternatively they may take a course at a college of technology for four years followed by a further four years practical experience.

Higher education for architects is given at the Institutes of Technology in Stockholm (KTH), Gothenburg (GTH), and Lund (LTH). In Lund the Institute is organised as a technical faculty of the University. These three Institutes have special schools for architecture, which are closely connected with schools of civil engineering and, in Stockholm, the School of Land Surveying as well. Certain parts of the architectural education can be given in other technical schools but students from these colleges must obtain the better part of their technical education in schools of architecture before qualification.

The three schools of architecture are organised differently and specialisation to a certain extent takes place but always in the latter part of the course. After basic education in any of the schools of architecture and institutes of technology (or at the University), there are possibilities for further education. Time is reserved in all

courses of study for subjects of architectural design and community planning as post graduate courses too. The schools of architecture are now making plans for setting up programmes for post graduate studies according to recently issued new training regulations and these studies will lead to the degree of Doctorate of Technology (TeknD). Engineers in Sweden are trained for five years at a University and receive a degree of 'Sivil Ingenior'. Firms of architects are small in size; the greatest number of firms have less than five employees but there are a few larger practices. Most public and local authorities have architectural staff in technical departments.

On larger Contracts a building controller (byggnads-kontrollant) has replaced the designer as the 'project manager', responsible not only for site co-ordination but also the part tender technical accountancy functions of settling final accounts and valuing interim payments.

TECHNICAL ACCOUNTING

Quantity surveying practice does not exist in Sweden as an independent profession. The work of technical accounting is the responsibility of the architect who devotes about four to nine per cent of his studies to this subject. This is considerably more training for architects in building accountancy than in any other European country. The day-to-day measuring work, however, is undertaken by a technician—the building cost adviser (BCA). When quantities are used for private contracts they are generally prepared by a technician—a 'quantity reckoner' (Massberäknar)—who specialises solely in measuring from drawings.

For small housing work the tendering documents are usually produced by the architect's office, often by the architect himself. In the larger office, the preparation of tendering documents may be left to an assistant, or a 'quantity reckoner' may be employed on the staff.

Quantities very seldom form part of a contract but are used as a basis for negotiating variations. Adjustments for increase in costs are usually based on an index and variations are usually permitted on the basis of a schedule of rates. The traditional bill of quantities is integrated into the specification. Together they form a document edited into 'chapters', beginning with chapters for preambles and preliminaries and continuing with chapters divided up mainly by trades. Each chapter starts with a more general text and gradually becomes more specific until particular items are specified. Then the quantities are stated for these items which in a tender are priced with a unit price and a total sum.

Due to the use of standard specification clauses descriptions used in bills of quantities are brief and bills tend to have a minor production bias.

In Sweden it is an accepted practice for quantities to be checked. A period is usually allowed for this after which no variations are allowed on the grounds of divergence between the bills of quantities and drawings. (A useful point for U.K. builders to note.)

When quantities form a part of the contract, they are usually measured by the 'Massberäknar' and they are generally in the form of a schedule of rates submitted with a tender including a provisional sum to cover variations which are usually valued on analogous rates. The tender documents are: the General Conditions of Contract (with additional clauses as may be appropriate), des-

criptions of the project, a full specification, drawings and bills of approximate quantities. Contractors often produce their own bills of quantities when tendering with a schedule of rates to be used for negotiation of the final account which is the responsibility of the builder to prepare. Lump Sum settlements are also fairly common in adjusting variations. Most contracts have design cost variation clauses, and the adjustments for fluctuations in labour and materials are undertaken on an index basis.

CONTRACTS

A special statute of procedure states the policy to be followed in obtaining and examining tenders for Central Government Contracts when there is no implicit rule for accepting the 'lowest' bid.

The general conditions of contract for building civil engineering installation work (AB) which is issued by the Association of Swedish Engineers and Architects (STF) have been drawn up by representatives of the large number of organisations and authorities. This is used for about 90% of the contracts placed.

The general specifications of materials and workmanship (AMA 72) is widely used. Nationally used building products are to be found in a special catalogue of approved designs issued for various trades for all the components with the approved practice for them. There are also national recommendations for contract drawings and project specifications. A specialist service by the 'Beskrivniskonsult'—a technician—is often used by architects to prepare a specification.

No special requirement is required to undertake construction in Sweden though certain forms of qualifications are necessary in order to be accepted when working for a building organisation. The Swedes have a degree which relates to the form of trade and also contains certain stipulations limiting the right of foreigners to engage in business.

Three main forms of contracting exist: Separate sub-contracted trades (about 30%), Turnkey (about 30%) and General Contracting (about 40%). Cost-plus contracts and negotiated contracts are not widely used. About 50% of building work in the housing field uses prefabrication.

In the first type the client designs the work, employs the architect and then contracts to the specialist contractors who undertake design of the services for heating, ventilation and electrical services. The carcass work is either contributed by a building contractor who sub-contracts to trades, or by separate trader, or the construction of a project is undertaken by a number of independent contractors all of whom have priority of contract with the client. In this case each sub-contractor is known as a 'specialist contractor' due to his legal state in the contract. Each contractor is free to engage other contractors for the operations included in the contract.

There are two basic forms of competitive contracting: Open invitation to tender takes place through the normal advertisement in the trade press, but there is also restrictive adjudication allowing special firms only to submit by invitation.

In the Turnkey type of contract the package deal philosophy is used but the investors' requirements are usually only considered in terms of performance specification. Moreover, frequently the 'package' is negoti-

ated when the carcass work is completed. General Contracting is usually by competitive tenders.

CONTRACTING ORGANISATIONS

There are about 4,800 firms in the construction industry employing more than two persons in the market but the majority of these are small firms and only 8% have more than 50 employees, although these 8% are responsible for 80% of the total production. The 17 largest firms each employ more than 1,000 persons and are responsible for about 50% of the production.

The small building firms have a strong trade basis. Two-thirds of the turnover of these small firms is derived from work commissioned directly by the developer on new construction projects in the form of sub-contracting, while one third of their turnover is derived from work as sub-contractors in other construction firms.

The Association of General Contractors and House Builders of Sweden has its own rules for turnkey (package deal contracts) (Riktlinjer totalentreprenad—guiding principles for package deals), including stating the documents required, drawing up of tenders etc.

In Sweden 'design costs' are mainly established on the basis of fixed prices, schedules of rates from bills of quantities, or day work rates. The fixed price system, is a 'lump sum' form of contract which may not be changed unless the scope of works in question also changes. The contract also has clauses providing for various degrees for compensation for increases of prices.

Contracts involving quantities involve a number of fixed prices agreed for a number of different units of work related to the physical measurement of finished work at the macro level. Payment is frequently subject to re-measurement.

The Building Controller (Byggnadskontrollant), is replacing the architect as project co-ordinator and is responsible on large schemes for financial control, site co-ordination, progress payments and variations. Usually he is trained as a building engineer and though he has training in technical accounting this is usually delegated to the BCA (who is a technician). This controller has stemmed from the practice of single trade contracting which requires site co-ordination in the hands of the architects (very similar to the practice in Scotland before circa 1965).

LABOUR RELATIONS

The practice of collective bargaining is very widespread in Sweden, and the number of workers concerned has constantly increased. This has considerably influenced labour relations. First, it has an incentive system unrivalled in Europe (and only practised elsewhere in a limited area of Bavaria), and second, the reason for this influence is a progressive labour law, which was successfully applied nearly fifty years before the controversial U.K. Industrial Relations Act.

(1) *The Swedish method of bonusing—the Ackord piece rate method*

Swedish building contractors have had long experience with a piece rate wage system which is considered to have the greatest effect in stimulating performance. This system works in such a way that the worker's earnings are related to his performance and that the labour costs are intrinsically independent of the workers' levels of performance.

The piece-rate system, especially, increases the demand for a well founded knowledge of the production process and creates relationship between the time worked and the piece-rate.

In order to determine the piece-rate, it is necessary to know how much time is required to do the particular job (operation or work piece). There is no single time for each job. How long it takes, is dependent upon the conditions under which the work is done, primarily the conditions with regard to plant usage, the planning and organisation of the work, the methods, working and consideration of constructional details with regard to the complexity of the design and nature of the materials used.

In the application of piece-rate price lists used nationwide the payment for job performance for each individual project must be judged entirely according to the prerequisites of the price list.

The labour price lists must undergo a constant revision with the generally changing work methods.

(2) *The special labour laws of Sweden*

The law which concerns the labour market in Sweden is usually referred to as the 'laws of labour peace'. Of these laws, the Labour Collective Agreements Act of 1928 is the most important. Under this law, the employer is bound by the collective contract which his organisation has concluded with its opposite number, the owners. By an express provision, any individual agreement that conflicts with a valid collective contract is void and may carry a penalty.

A characteristic of the labour market is that direct action such as strikes and lockouts are permitted in principle, but the collective Agreements Act makes one exception to this rule: during the validity of a collective contract the contracting parties or their members may not resort to direct action in a dispute on the interpre-

tation of the contract nor with the object of altering the terms of the contract, e.g., to force through higher wages. Only in other circumstances are strikes and lockouts permitted. 'Collection blockade', i.e., direct action aimed at forcing the disbursement of workers' uncontested arrears of wages, are unfortunately by no means rare, nor are blockades against employers who refuse to conclude collective contracts with the trade union.

Under the Conciliation Act the government appointed eight mediators who—each in his own particular district—must intervene when a labour dispute occurs.

INTEREST OF SWEDEN TO THE U.K. MARKET AND THE QS PARTICULARLY

Due to the distance from the United Kingdom the country has little to offer regarding exports for the building market because of its own manufacturing capacity although specialised high quality goods may have a limited market.

While Sweden differs little from the rest of Europe regarding the organisation of technical accounting i.e., the architect is responsible and the work is delegated to technicians, practice offers two very useful points which could be discussed in much greater detail in the U.K. First the 'fixed price' contracts which encourages the reduction in variations and second, the use of analysed bills of quantities which could easily be adopted over here if the N.B.S. and data co-ordinators were received with greater enthusiasm.

The author wishes to express his thanks to the Director of the Building Research Establishment for permission to prepare this paper privately. The views expressed are those of the author alone.

Technical Queries

The following is a selection of questions submitted to the Members' Advisory Panel, together with the replies which were forwarded to the enquirers. We would be interested to receive the comments of readers who may be able to amplify any of the replies or who may have different views to offer in respect of them.

Members sending queries to the Panel are particularly requested to ensure that all relevant information is included, especially in regard to the precise edition of which form of contact, the method of measurement, specification clauses and bill preambles. When forwarding photostatic reproductions of documents it would be appreciated if ten copies could be sent for distribution to Panel members, as it is not always possible to make satisfactory photostat copies of photostats.

Question

Measurement of timber receiving clear finish

I would be grateful for your advice regarding Clause P1(c) of the SMM. The above clause states that timber required to be selected and kept clean for staining or polishing shall be so described. In your opinion, would you say that the application of polyurethane varnish also comes into this category, or is there a particular reason why staining and polishing should be stated and not polyurethane?

Since the selection and preparation of the hardwood, prior to the application of polyurethane is exactly the same as that for staining and polishing, I would have thought that the principle is that a clear finish is required.

Answer

A clarification to Clause P1(c) of the SMM, issued in

September 1972 by the SJC, states: "The principle underlying this clause is to indicate that timber to be given a transparent finish or left in the white will require special selection and to be kept clean and must be so described."

Polyurethane is a fairly recent material and was not in use when the SMM was published. However, the requirements are obviously the same as for staining etc. i.e. (1) the wood must be *selected* as blemishes, damage etc. would show through the finish; (2) it must be *kept clean* for the same reason, involving special storage and protection.

The Introduction and Clause A1 of the SMM emphasise the need for full descriptions. The items must be properly identified to enable the Contractor to consider the cost implications and price accordingly.