

N.I.R.N.S. - REPORT ON PACKAGE CONTRACT FOR
PLANT STORES BUILDING R.24 JOB NO. 6645

The requirement was for a Stores Building of 14,000 sq. ft. and 15 ft. clear height, to be provided as quickly as possible to meet an urgent storage need.

NIRNS had made preliminary enquiries regarding a standard-type building which could be obtained on the basis of a "Package Deal", and it had been indicated that this could be provided within the £25,000 - £35,000 bracket, dependant upon the degree of finish and appearance required and that the time required for completion would be 9 months from receipt of order.

Southern Works Organisation were asked to obtain prices on this basis and a Brief Functional Specification and drawing were prepared, and 9 firms approached of which 4 submitted schemes and prices. The drawings submitted to the contractors were the Authority's survey of the site, Drawing No. SW/S6645/CS/484, and an outline scheme as shown on drawing No. SW/S6645/CS/485.

After careful examination of the schemes, and taking into consideration design, cost and construction period, the tender of Messrs. Beechams Buildings Ltd. was considered the most favourable. The main reason for this decision being as follows:

- (a) Generally the building offered greater scope for adaptation to allow alternative user should future development so demand.
- (b) The total floor area provided is slightly greater than offered in other schemes and the approach roadway and hardstandings allow more ample areas.
- (c) The high level method of glazing allows better distribution of day-lighting.
- (d) The frame of the building is in concrete and thereby reduces the fire damage risk.
- (e) Maintenance and repainting costs will be negligible compared with asbestos cement sheeting on steel framed buildings offered by other tenderers.
- (f) The overall appearance proved architecturally superior to the other schemes submitted and the flat type aluminium roof conforms with the accepted elevational treatment of existing buildings on site.

The accepted tender figure, inclusive of Heating, Electrical, and all other services, together with associated External Works, totalled £32,663. 9.0d.

The main dimensions of the building proposed were 183 ft. 4 ins. x 40 ft. with a clear height of 15 ft. to the beams, giving a total floor area of 14,600 sq. ft. super and the total cost per square foot, inclusive of all services, approach road and hardstanding, amounted to only £2. 4. 7d. approximately. This cost, of course, excludes any racking or other loose fittings. The building, when completed, has met the full functional requirements of the Client who is well satisfied with the results.

From the outset it should be realised that this is by no means a new procedure in regard to Stores Buildings, and that contracts of this type for this kind of building have been used for a considerable time on numerous Government establishments, although the name "Package Deal" is now applied whereas various terms were used previously. One main difference, however, does arise, namely that in the past the Heating and Electrical work have invariably been omitted from the "Deal" and dealt with as separate items.

Architectural Design

Generally, the appearance of the building is slightly below normal, but this could have been put right by quite a small expenditure, and no great criticism should be levelled against a firm on this score. If a similar building were to be erected, minor improvements in detail could greatly enhance the overall appearance of the building, especially on the end walls. This is a matter which comes to light from experience with a particular firm.

It is, of course, realised that the Architects' drawings were not produced by the Authority, and in this connection it can be recorded that minor comment only was necessary on constructional points by the Architects Section in respect of the working drawings and details supplied by the Contractor. Messrs. Beechams' staff dealing with the job were co-operative and willing at all times to make the slight modifications to details arising from criticisms which were forwarded from the approval of the drawings. After "Contract Let" had been notified only nominal professional time was expended by Architects dealing with this particular service.

One major criticism of the design of the building from a constructional aspect has arisen, and this is in regard to the type of roofing which is not wholly satisfactory. In this case, this was a new type of aluminium decking as far as Beechams were concerned, and they have intimated that they are unlikely to consider this material for future contracts.

Structural Engineering

The Structural composition of the building presented a number of problems for the Authority's Senior Structural Engineer, and his comments covering Structural services on the scheme are set out below:

- (a) It is essential that the Authority specifies the standard of the various types of material that it will accept.
- (b) The Authority structural design effort on a package job is not significantly less than on a fully Authority designed building.
- (c) The total period spent in structural design is the same whether on a package or custom-made building - they merely occur at different points on the overall programme.

Civil Engineering

As may be expected, owing to the necessity of working the scheme into the general service arrangements of the site, the amount of design work for Civil Engineering services was little affected by the Package Contract. Messrs. Beechams were supplied with schemes for drains which they incorporated in their own drawings, and in this instance, duplication of work arose.

Our Civil Engineers, commenting generally on the "Package Deal", state that from past experience, the drawings of Package Contracts have to be very carefully checked and invariably sketches forwarded giving suggested revisions necessary to meet the local conditions.

Mechanical and Electrical Engineering

In these particular fields, Package Contracts have always presented some difficulty, and even in this simple case, they presented quite a number of problems and the report from our Engineer on this service is as follows:

The main aspect on the Engineering side, which appears to be common to all package contracts, is the difficulty experienced in obtaining detailed working drawings from the sub-contractors.

The electrical sub-contractor was F.H. Wheeler, and although the Stores Building has a very simple electrical installation the early drawings prepared by Wheeler contained basic errors and were lacking in detail, i.e.

- (a) The incoming main supply cable could not have been terminated had the initial switchgear arrangement proposed by Wheelers been installed. The cable size was greater than the gland and terminal facilities could accommodate.

(b) The feeds to the unit heater motors were not detailed.

It was later discovered that Wheeler's original quotation to Messrs. Beechams did not include the cost of the unit heater wiring and this cost was subsequently accepted by Beechams.

The mechanical services sub-contractor, Brightside Heating, who had only to supply and connect up eight unit heaters, did not co-ordinate his installation with the electrical sub-contractor, the result being a clash of position of lighting fittings and unit heaters.

Difficulty was also experienced in establishing the type of thermostat and unit heater starters ordered by Brightside Heating, the result being that equipment of the wrong type was ordered and eventually Wheeler's had to obtain equipment from local stockists to enable the completion date to be achieved.

The time spent by U.K.A.E.A. Engineers on the project was excessive for a building of this nature, certainly longer than would have been required for the preparation of drawings for term contract work.

Since completion and handover of the stores building, I have heard that the lighting fittings are now to be changed and the unit heaters repositioned. Trouble is being experienced with the use of a fork lift truck in the store due to insufficient headroom. The lighting intensity specified in the package contract was much higher than normally provided in a store - this was to allow for future alternative use of the building.

A lighting layout prepared by S.W.O. in direct consultation with the Client would have allowed the same result to be achieved without the initial installation of a large number of fittings. A more economical arrangement than the one achieved.

The standard of workmanship on site was of equal standard to that of other similar contractors and the Resident Engineer has no comments to make on the sub-contractor's performance on site.

Trouble was experienced with the external mechanical services which did not form part of the package contract and this resulted in the construction of an additional drainage catchpit. The catchpit was associated with a drain installed by Beechams and as the original drain was still covered by Beechams maintenance period they were asked to construct the catchpit. Difficulty was experienced in getting Beechams to construct this catchpit, which was required quickly to avoid the payment of pumping charges to keep an excavation free of water.

Beechams had men on site but they were fully committed on another package contract and they were reluctant to release men for the drainage work. Had the original drain been installed by the resident site civil contractor both labour and material could have been readily available to obtain a quick catchpit construction.

To summarise, far less difficulty would have been experienced on the M & E aspects of the Stores Building, and a more satisfactory result achieved, had the design been prepared directly by S.W.O. and the installation carried out by use of term contractors.

Programme

Beechams undertook to complete in 24 weeks from date of acceptance. Completion was actually achieved in 26 weeks, but this was not entirely their fault, as the division of the 24 weeks was as follows:

4 weeks for preparation of drawings and commencing work.
20 weeks for construction.

The 20 weeks for construction was achieved, but due to details on the drawings, 6 weeks elapsed between acceptance and commencing work.

Supervision on site

Due to the very limited specification and the limited detail drawings, control of the quality of the building and services on site was generally very limited. In the view of the Resident Engineer, in this simple type of building, little is lost by this lack of control but for anything more than this, lack of control of detail in relation to contract drawings would no doubt seriously detract from the efficiency of the building. There are a number of items such as fixings for unit heaters, position of switchboard conduits and lights, and fixings for roller shutter doors which site control on a normal contract would have improved considerably at little or no extra cost.

He also states that little difficulty was experienced in keeping the Contractor to programme, though he showed little appreciation of the co-ordination and progressing required in relationship to M & E sub-contracts, but in this instance this was offset to some extent by the Electrical Contractor being already well established on the site and thus serious delay did not arise. Generally, the site staff found the firm's representatives co-operative throughout, which assisted the Authority's staff to overcome any difficulties and the job generally proceeded smoothly and without trouble.

Conclusions

For a simple storage building of this type, there could be little criticism of this building, or of its execution. It has been erected in the time required, has met the Client's demands and, on the Architects' side, has reduced the amount of drawing time which would be normally spent on a building of this type. On the Structural and Civil Engineering side, there has not been the same economy in design effort, and on the M & E Engineering side, little has been gained.

The results of this building should not necessarily be taken as a guide to the situation which might arise on a building of a more complex nature, and for these more elaborate buildings, we should wait and report on the Heavy Duty Laboratory and Office Block at present under construction. Generally it is thought that in any case, the Mechanical and Electrical work might with advantage be considered as outside the normal "Package Deal".

(G.W. Dixon)
Chief Architect

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GWD/MD