

At the Chicago meeting of the Associated General Contractors of America, this topic was discussed and Brig.-Gen. R. C. Marshall, Jr., chief of the construction division of the U.S. War Department, pointed out the fault of the usual pre-war basis of contract. He showed the impossibility on recent war work of asking for competitive bids, because speed was the essence and detailed plans and specifications were never complete at the time when construction had to start.

On such work it was, therefore, out of the question for a contractor to bid on a flat contract price basis. It would not have been fair to either side. As a result, there was developed a form of contract known as the cost-plus-sliding-scale-fee contract.

Gen. Marshall said that early in the spring of 1918, the program of work before the construction division was so extensive that it seemed advisable to have the merits of this form of contract again passed upon, and a committee of eminent business men unqualifiedly endorsed this form of contract. In Gen. Marshall's own words at the convention of general contractors:—

"Unjust, Inequitable and Uneconomic"

"No contractor should be called upon nor permitted to undertake the performance of any contract that within the four corners of the paper upon which it appears is, or may be, written the financial bankruptcy of the contractor. It is unjust, it is inequitable, it is uneconomic. The great lesson of this war on the subject of the relationship between the contractor and the owner is the cost-plus contract. This represents the only equitable basis under which a contractor may perform constructive and economic services for the owner. It is the only form of contract which affords protection to both parties. To me all the energies, the thought and the experience of this country within its own continental lines during the past year and one-half of this world struggle, shall have been in vain unless out of it shall grow, as a permanent institution, solidifying the economic relationship between the contractor and the owner, the cost-plus contract."

We have been operating under this plan almost exclusively for several years. We know that it is possible to convince most business men of the perfect fairness of the cost-plus contract, and among our clients are several who would be the last to tie themselves up with us on any basis of contract likely to be unfair or dangerous. We have built on this basis for the Robert Simpson Co., Ltd., Toronto, five separate buildings; for the William Davies Co., Ltd., Toronto, six buildings; and for Montgomery, Ward & Co., four successive times.

For these firms we have been able to start actual construction much earlier than otherwise would have been possible, which means early occupancy. The reason for this is that we can start the foundations just as quickly as the foundation plans are complete, and further design and construction may go on coincidentally.

Complete Plans Not Necessary

Money tied up during construction earns nothing until the building is ready for occupancy, and the interest often amounts to a considerable sum. When we have opportunity to work with the owner, engineer and architect from the very inception of the plans, and when we begin foundations as soon as the general contour of the building and equipment are determined upon, we are able materially to cut down the period during which the owner's capital is unproductive. Under the lump-sum contract it is necessary that the plans be complete before bids are taken, which may delay occupancy for months, and without occupancy a building investment is poor as a dividend producer.

But, while speed is of first importance in most building contracts, yet fairness to both parties is an equally good reason for the general adoption of the cost-plus contract, and on that basis our company is now operating almost exclusively.

Unquestionably the contractor is called in because he is an expert in building, and not to absorb the risk entailed in the lump-sum contract. If it is not the purpose of the owner to buy price insurance along with his building, then cost-plus-fixed-fee is a better basis.

BRITISH ENGINEERING STANDARDS REPORTS

(Concluded from page 294)

Report No. 71-1917. *Report on British Standard Dimensions of Wheel Rims and Tire Bands for Solid Rubber Tires for Automobiles.*—This report gives standard sizes of wheel rims and corresponding internal dimensions of solid rubber tires, for sizes of wheel varying from 670 mm. to 881 mm. Metric dimensions are used throughout.

Report No. 72-1917. Revised September, 1917. *British Standard Rules for Electrical Machinery* (excluding motors for traction purposes).—This important report is intended to define the conditions which characterize British standard electrical machinery, including transformers but excluding traction motors, and to provide the purchaser and manufacturer with a general specification indicating the information which should be forwarded with an enquiry or an order for an electrical machine. Methods of defining the rating or rated output are formulated, and in this connection are in substantial agreement with the corresponding rules of the American Institute of Electrical Engineers. Enquiries based on these rules will enable the purchaser to compare tenders received from various manufacturers.

Report No. 74-1917. Revised September, 1917. *British Standard Specification for Charging Plug and Socket for Vehicles Propelled by Electric Secondary Batteries.*—This report contains the provisions necessary to secure interchangeability between any charging plug and any socket of the concentric type. Dimensions of the contact portion of the plug and socket, and dimensions of the gauges needed to check these are given.

Report No. 75-1916. *British Standard Specifications for Wrought Steel for Automobiles.*—This important report contains definitions of terms used, methods of testing, and specifications for ten grades of carbon, nickel and nickel-chrome steel, each specification giving chemical composition, tensile and brinell tests.

Report No. 76-1916. *British Standard Nomenclature of Tars, Pitches, Bitumens and Asphalts Used for Road Purposes and British Standard Specification for Tar and Pitch for Road Purposes.*—This valuable report defines tars, pitches, bitumens, and asphalts for road purposes, distinguishing between the tar products and bitumens and asphalts. In this respect the practice of the B.E.S.A. is not in accordance with that usual in the United States, where the term bituminous is applied in a wider sense than in Great Britain. The specification gives definitions, properties and methods of testing for two qualities of tar, and for pitch suitable for pitch-grouting.

Report No. 82-1919. *British Standard Specification for Starters for Electric Motors* (face-plate type).—This report covers definitions, pressures, methods of enclosure, standard sizes and ratings, general construction, marking and tests.

Report No. 84-1918. *Report on British Standard Fine (B.S.F.) Screw Threads and Their Tolerances.*—This report gives revised tables of dimensions for British standard fine screw threads and covers theoretical dimensions and standard sizes and tolerances of bolts and nuts for two grades of fit. The report also contains an appendix dealing with methods of determining and compensating for errors in pitch, form of thread and diameter. Much information is given regarding methods of gauging screw threads.

Report No. 88-1919. *British Standard Specification for Electric Cut-Outs for Low Pressure, Type O.*—This specification covers dimensions and standard sizes of cut-outs for low pressure and ordinary duty. A separate specification is contemplated for heavy-duty cut-outs.

Report No. CL3,750. *Interim Memorandum on French Metric Screw Threads for Aircraft Purposes.*—This memorandum describes the system of screw threads for aircraft purposes used by the French military authorities, and is accompanied by tables showing limits of size, tolerances, etc., for two grades of fit. The form of thread is that of the Systeme Internationale, in which the crest is cylindrical while the root of the thread is curved in section. The finer tolerances are provided for cases where great accuracy is required. The second grade tolerances are suitable for ordinary bolts and nuts.