

to each competing bidder in payment for the labor and expense involved in estimating and as a complete waiver of all obligations. In considering the amount of each bid, the total bid, including the sums of all alternate estimates asked for by the buyer, whether they be additions or subtractions, shall be considered, and the amount to be paid the bidder shall be reckoned thereon as well as upon the total bid; as, for example, if the bidder is requested to estimate upon a brick building with alternate estimate upon stone and another alternate estimate upon frame construction, then, assuming that the bidder's figure is \$20,000 upon the brick building, \$30,000 upon the stone, and \$15,000 upon the frame building, then the sum-total, or \$65,000, shall be used in determining the sum to be paid the bidder. Should certain bidders refuse or neglect to figure or bid upon alternates, they shall be paid upon the basis of their actual bids only.

A certificate of payment shall, upon request, be given to each bidder, properly filled in, signed and sworn to by the buyer before a qualified notary public, setting forth that the competition has been conducted in accordance with this form, and that the amount credited or paid to the bidder has been reckoned and computed in strict accordance with this, the "Nelson Form of Choosing Bidders and Awarding Contracts," its true intent and meaning.

PRIVATE WORK

1. *Selecting Bidders for Private Work*

If the buyer of the work to be figured upon is acting as a private individual, then he may choose his own method for selecting bidders, and he may select as many or as few as he may choose or wishes to compensate.

2. *Awarding the Contract*

If the buyer be a private owner, he, his architect, his engineer or other form of representative shall reserve the right to make contract with any bidder he may choose, provided, however, that he shall fully compensate all invited bidders in accordance with Clause 3.

3. *Paying for the Competition*

Paying for the competition in connection with work of a private character shall be done exactly as provided for in connection with public work and as shown and set forth under Clause 11, Public Work.

The Sub-Contractor and the Material Man

In putting this plan into actual operation, the Quad City Builders' Exchange, including the Master Builders of Davenport, Iowa, Rock Island, Moline, and East Moline, Illinois, adopted the following regulations applying to sub-contractors and material men:—

Second.—That this body shall recommend the following minimum factors as a basis for compensating bidders in accordance with the Nelson Form:—

General Building Contractors.—.5 or 50% of the square root of the average of all bids.

Sub-Contractors and other Principal Contractors.—.2 or 20% of the square root of the average of all bids.

Third.—That the above factors shall be used when bids are given to owners, their representatives, or to other contractors when such other contractors are not in competition.

Fourth.—When one contractor, however, renders a bid to another contractor who is in competition, it is arbitrarily assumed that the contractor giving the bid will, on the average, give four bids on the same work which he will have to figure or estimate only once. Therefore, under such sub-bidding conditions (and only under such conditions), the compensation shall be one-fourth of the regular compensation, or as follows:—

General Building Contractors.—.125 or 12½% of the square root of the average of all bids.

Sub-Contractors and other Principal Contractors.—.05 or 5% of the square root of the average of all bids.

Fifth.—Building material manufacturers or distributors shall not receive compensation for making unit prices on material. For example, if a price is quoted upon 10,000 brick at \$9 per thousand, or 5,000 yards of sand at 60 cents per yard, etc., such bidding shall not deserve compensation; but if such bidder is expected to estimate the material required to do the work intended and then guarantee the quantities or capacities to be sufficient, then he shall be considered in the light of a contractor and receive compensation.

Sixth.—That when the owner, or his representative, furnishes the bidder with guaranteed "quantity surveys"—or, in other words, with a unit of material upon which the bidder needs only insert unit prices and is relieved of the necessity of guaranteeing the quantities to be correct—then the amount of such unit list or quantity survey shall be deducted from the amount upon which the bidder is compensated.

BRITISH COLUMBIA TECHNICAL ASSOCIATION

THE British Columbia Technical Association held its first banquet on October 21st, in the University Club, Vancouver. The gathering took the place of the regular monthly meeting of the association at which it has been customary to deal with purely business matters. The executive intend hereafter to combine every business meeting with a social function. About one hundred civil, electrical, mechanical and mining engineers, chemists and architects were present. The chair was occupied by E. G. Matheson, professor of civil engineering of the University of British Columbia, who gave an interesting address, in the course of which he outlined the great part in the world's work which had fallen to the lot of technically trained men. He reviewed the activities of the association and stated that while the organization is only about eight months old, the membership is about 250, and that a total of 300 is expected by the end of the year. The secretary-treasurer of the association is R. Snodgrass, Board of Trade Building, Vancouver.

EFFECT OF FINENESS OF CEMENT

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15.—Concrete of all mixes and consistencies showed expansion in damp sand or water storage and contraction in air.

16.—The change in length of concrete specimens stored in air or water is independent of the fineness of the cement and the consistency of the concrete. The lean concretes are slightly less affected than the rich mixtures.

17.—The type of aggregate had little or no influence on the relative effect of fineness of cement on the strength of concrete.

18.—The tests included showed an intimate relation between the strength of the concrete and the water-ratio of the mixture. The lower the water-ratio (so long as the concrete is plastic and the aggregate not too coarse), the higher the strength, and vice versa. This confirms the results of other concrete tests made in this laboratory. Increasing the quantity of cement in a given mixture enables us to secure a concrete of equal workability with a lower water-ratio, hence a higher strength.

19.—In ordinary concrete mixtures (say 1:5 to 1:4, requiring 20 to 25% cement, by volume) increasing the cement content by 1% (to 20.2% for a 1:5 mix), gives an increase in strength of about 1%.

20.—One per cent. increase in cement is more effective in increasing the strength of concrete in lean than in rich mixtures.

21.—One per cent. increase in cement is somewhat more effective in increasing the early strength of concrete than at later periods.

22.—The effect of increasing the quantity of cement is independent of the consistency of the concrete.

23.—Tension tests of briquets do not give a correct measure of the relative merits of different cements as determined by compression tests of mortar and concrete.