

architect or engineer, if of any standing, will not disappoint his client. In all communities of any importance the building regulations are sufficient if properly enforced. His legal adviser's professional standing and reputation warrant the confidence placed in him. The inspector is in a position where his ability and trustworthiness can be ascertained and if unsatisfactory a change can be made. The builder's reputation for reliability, experience and honesty of purpose should determine his selection, but here is the weak link in the chain.

The owner is selfish in his desire to secure his structure for the least cost possible and almost invariably will award the contract to the lowest bidder, although usually a provision in the specifications allows the opportunity for discrimination. What is the owner's protection at this point and who should he expect to consult with him, advise him, and if necessary remonstrate should he persist in the awarding of the contract to the lowest bidder, if there is any doubt as to his desirability? The builder is selfish in his desire for the job and the anticipated profits he expects from his estimates. Suppose he is wrong in his estimate, who is to protect him? The owner needs protection against the results of too low a bid and the builder is in exactly the same position.

Too often the owner is advised by his legal adviser to go ahead, for even if the builder's bid is too low the bonding company is back of him. The architect or engineer desires that the job be let, as his fee is dependent on the construction. If the builder fails or makes breach of his contract the work must be completed by the bonding company, whereupon the architect or engineer will still secure his fee and the legal adviser, if such difficulties develop, will secure further fees from the adjustments, and possible, and I may say, probable litigation.

Are such advisers truly disinterested or in a position to advise? There is reason to question that such is the case and the interested party who by position and moral obligation to the owner and builder should be called upon to advise carefully and properly is the bonding company and liability insurance company. Why? The reason is logical and simple. Nearly every specification for important work requires a bond, not only covering construction, but also the maintenance and a guarantee. A liability insurance company's policy is generally demanded, and if not, it should be.

These companies are constantly thrown into contact with construction work of all kinds and their rates are the direct result of their experience. They presume that the builder making a bid and asking for a bond or policy knows his business and their inquiry of him is generally the question as to his financial strength with reference to the size of the proposed job, and with reference to the amount of other work he has under construction. The rate is determined by the standard rate for the same kind of work.

Suppose these companies go further in their investigation. Suppose they investigate the builder personally as to his previous experience, his organization, his equipment, his estimate and proposed methods, his prices for material and labor, etc., and compare his bid with the other bids submitted, with proper consideration for the same qualifications of such other bidders. The bonding company, the liability company and the financial backer of the builder are all taking a chance on the builder's reliability and honesty, and, granting his honesty has been established by previous association, still each new job affords the opportunity of errors and bad judgment. An exceptionally low bid is always to be regarded with suspicion and the bonding company, the liability insurance company and the financial backers have a right to demand from the owner the relative standing of the bid of the low or successful bidder with the balance of the bids. Such errors and bad judgment many times prompt and lead to the work being sacrificed and skimmed and methods of work adopted to save money, which result in damage to the work and to the employees. No ideas of premiums should influence the higher thought of only backing the man who can demonstrate his fitness. In addition, by such investigations, the losses to these companies are reduced to a minimum and the

rates charged can be correspondingly reduced and yet as much profit result. The owner is protected by the refusal to bond or furnish a policy, and the builder, even at the result of his own immediate injured feelings and humiliation, is protected against a sure ultimate loss.

But all this is looking at the question from the purely selfish, money-making or losing point of view of the owner, the builder, the bonding company, the liability company and the financial backer. Let us go back to the moral responsibility of the individual or firm to the public, and with special reference to this new, better construction in reinforced concrete, which can and will revolutionize the art of building if properly organized and controlled. Failures have occurred by the use of this splendid building material, and advantage has been taken of this fact by competing jealous constructions in wood, steel, iron, brick and stone to influence the public by criticisms through the public press. Is this fair? By years of actual use the education of the building trades has been largely completed in the use of these other materials and full and complete data published in standard tables. Even the ordinary uneducated laborer has by usage and association formulated an opinion as to safe construction with same. At the present and for some time to come, knowledge of construction in structural concrete must be confined to the few who will spend the necessary time to study and develop the industry. In time this opposition of competing materials and labor unions must disappear and concrete take its place as a standard, with standard rules, tables and methods.

The responsibility for these failures can not be placed upon the material, but instead may be analyzed as follows:

First—Failures caused by bad design. These would not have happened if the proper regulations of the building laws had been enforced, but granting this control is lacking, no builder of experience and ability would bid upon or construct such a design.

Second—Failures have happened because of improper materials or workmanship. A builder such as just mentioned will use no such material and his experienced organization will prevent the latter.

Third—Failures have occurred because of the lack of knowledge of the properties of concrete, plain and reinforced. Such could never be with the builder who is properly qualified.

Where, then, rests the responsibility? Is it upon the builder? The builder may, with motive and intentions of the best and seeing the rapid advance of building in concrete, decide to enter the new field. What others have done and apparently made money doing he can do. Loss of money, possible business failure, may result to him; litigation, loss of property and above all loss of life may result because of ignorance. The builder's ambition is sincere and to be commended, and no one told him where he was wrong until the damage was done. His estimate is confidential and can not be exposed to his competitors of more experience. His men are lacking as he is in experience, unless he has engaged experienced help before entering the field, which is improbable, as such an organization is generally formed after the work has been awarded. In facing the responsibility, therefore, why not look to the bonding company and the liability insurance company, who are constantly coming in contact with construction work, and who must be a party to the contract sooner or later, who are in a confidential capacity by the very nature of their business, and who are in a position to dictate whether the builder shall have the contract or not by either furnishing or refusing a bond and liability policy.

In order to benefit by this protection, it is incumbent upon the owner to require a bond and liability policy from a company of established standing and to select a builder, not necessarily the lowest bidder, who is qualified and who can furnish the bond and liability policy.

Construction Organization.

There is no kind of construction which requires more detail labor and inspection under more adverse conditions than structural concrete. I do not say this to discourage the line,