

Warranty Bonds from the Perspective of Surety Companies

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Introduction

The recent economic downturn and an unexpected increase in losses have greatly affected the surety industry. Several top underwriters have left the surety market, and a large number of acquisitions and mergers have recently taken place in the industry. Also, many surety companies have changed their underwriting philosophy and raised their underwriting criteria and standards. Consequently, contractors are currently facing a more comprehensive list of questions in the underwriting process, as well as the reluctance of surety companies to increase bonding capacity (Hughes 2002). However, the concerns in the surety industry are not limited only to the recent unexpected losses. Another source of concern is the requirement for long-term warranty bonds by state departments of transportation (DOTs) on warranted highway projects. Sureties are mostly worried about the risks involved in issuing these long-duration bonds and the additional effort needed in the underwriting process. The ensuing increase in the premium rates and the limited availability of warranty bonds to small contractors are additional matters of concern (Hastak et al. 2003).

In view of these observations, this forum provides valuable up-to-date information on warranty bonds from the perspective of surety companies and presents the results of a survey that was conducted for this purpose. Since the analysis is based on responses from surety companies in the United States that have experience with warranty bonds, the study becomes beneficial for industry practitioners and researchers because it can help them understand the opinions, expectations, and recommendations of warranty bond underwriters in the surety market.

Description of Problem: Warranty Bonding

There are various types of construction contract bonds. The most common ones are bid bonds, performance bonds, and payment

bonds. Also, bonds such as maintenance bonds, supply bonds, and completion bonds are occasionally included in construction contracts. In addition to conventional contract bonds, state DOTs are now requiring warranty bonds on projects with warranty provisions (Bayraktar 2003).

Typically, warranty bonds are long-term maintenance bonds that are required by state DOTs on special highway projects. Under the warranty provisions and scope of work, the contractor is held responsible for any remedial, elective or preventive maintenance work that may be needed during the specified warranty period, with no additional cost to the state DOT. Hence, the surety company providing the warranty bond guarantees the contractor's operational and financial viability over the period of obligation. Since typical durations for warranties range from 3 to 10 years, they are considered long-term obligations and raise several concerns for surety companies from the standpoint of risk. The main difficulty for sureties is predicting the contractor's financial position in the future. According to the underwriters, regardless of the current financial strength of the client, predicting its position beyond two years becomes a game of Russian roulette; and as the duration of the warranty period increases, the stakes in the Russian roulette game increase accordingly (Bayraktar et al. 2004; Ness 1996).

The Surety Association of America (SAA) has published a position statement concerning long-term warranties. According to the statement, sureties typically raise their underwriting standards because of the increased level of risk associated with warranty bonds and write warranty bonds only for large and financially strong contractors. Competition may therefore be reduced and construction costs may increase. The statement also indicates that surety bond costs are further increased for long-term warranties (SAA 2001). Krebs et al. (2001) estimated an increase of 5 to 15% in the premium for a qualified contractor on a five-year warranty pavement project. The SAA statement also provides several recommendations for reducing the risk of surety companies on long-term warranty bonds, including limiting the warranty period to three years and limiting the guaranteed amount to 10% of the final contract price (SAA 2001).

Questionnaire and Interview Surveys

To evaluate warranty bonds from the perspective of surety companies, pertinent data were collected by using a questionnaire survey. The prepared surety questionnaire was sent to 47 bonding companies in the United States. A total of 10 responses were received from 10 different companies, giving a response rate of approximately 21%. However, a bonding company responded with a general information letter instead of filling out the questionnaire. Therefore, unless stated otherwise (some respondents did not answer all the questions), the results of the questionnaire survey are based on nine bonding-company responses. Also, an interview survey was conducted to reach more underwriters, receive additional information regarding warranty bonds, and

provide better results by combining the interview and questionnaire surveys. During the course of the study, a total of 10 interviews were conducted with experts from 10 different companies in the surety industry. Of the 10 companies interviewed, nine were different from those who had responded to the questionnaire survey. The titles of the interviewees were executive vice president (one), director of surety (three), director of underwriting (one), and surety representative (five).

Results of Study

The following sections represent the major findings of the questionnaire survey, as well as a discussion that summarizes the opinions and viewpoints of the interviewees regarding warranty bonds. However, the results of the study represent the responses received and may not be applicable under all circumstances. The questionnaire provided respondents with options for each question, but they could also indicate their own answers if none of the given options fit their opinion. Also, as previously mentioned, some respondents did not answer all the questions. Therefore, the number of responses received to some questions discussed below is not nine, the total number of respondents to the questionnaire. Readers can contact the authors, to obtain copies of the questionnaire survey form and the list of interview questions.

Respondent Profile

Six of nine respondents provided the amount of the annual direct premiums written by their company. Four of those six respondents (67%) indicated that the amount was more than \$100 million, whereas the remaining two respondents indicated that it was \$10 to \$100 millions. No respondents indicated that total direct premiums were less than \$10 million. According to the report of the Surety Association of America (SAA) for calendar year 2001, only 11 surety bond writers in the United States had direct premiums written for more than \$100 million, and these 11 bonding companies held about 68% of the total U.S. surety market with respect to premiums written.

Five of nine respondents also provided the type of pavement projects for which they typically write warranty bonds. Two of the five respondents (40%) issued warranty bonds for major pavement projects, including asphalt pavements, concrete pavements, new decks, and deck overlays, as well as several preventive maintenance projects such as microsurfacing, chip seal, crack seal, saw and seal, hot-in-place recycling, and pavement marking. The remaining three respondents (60%) issued warranty bonds only for major pavement projects.

Risk Evaluation of Warranty Bonds

Seven of nine sureties responded to the question about their preference for when a warranty bond should be issued. Four of the seven respondents (57%) indicated that they should be issued after construction completion, whereas the remaining three (43%) preferred to issue warranty bonds when bidding. No respondents indicated issuance of warranty bonds during construction or when signing the contract.

Five of eight respondents (62%) indicated 15% as the appropriate level of bonding for typical warranty projects. Two respondents (25%) indicated 10%, which was not provided as an

option in the questionnaire; and only one respondent preferred 30%. No respondents indicated higher levels of bonding.

The seven respondents (100%) indicated that more time and effort were required for evaluating warranty bonds than for performance/payment bonds. Three of the seven respondents indicated 30% as the level of average increase in the required time and effort, whereas one respondent indicated a 20% increase. Two sureties indicated 50% increase and one surety indicated 100% increase, values that were not provided as an option in the questionnaire.

The survey also revealed that the underwriters use the same risk-evaluation methods for both warranty and nonwarranty projects. However, according to the respondents, the bonding companies are more thorough with warranty bonds. Consequently, capitalization, financial condition, management, and experience for contractors are thoroughly evaluated. Also, the time and amount of the warranty bond, the scope of the project, and the contractor's approach to the warranty were determined as additional underwriting variables for long-term bonds. However, all respondents indicated that the current methods are not adequate for proper assessment of the risks involved in warranty bonds.

Similar results were also obtained from the interview survey. The interviewees were very concerned about long-term warranties in general. All the interviewees indicated that it is impossible for them (instead of very difficult) to guarantee that a client firm will be in business for three years or longer. One interviewee called warranty bond underwriting a "hope;" another one called it a "joke;" another one, a "speculation;" and another one, a "bet in Las Vegas." One interviewee cited the collapse of Enron as an example for the situation and indicated that no one could have predicted that a Fortune 500 company, the number corporation in the country, would go down in a 2-year period.

In general, the surety companies are comfortable with their prequalification process for regular projects and indicate that it gives them enough information and certainty to make the performance and payment guarantees. However, the interviewees indicated that the underwriters do not have the ability to predict the future on an obligation that goes on for three years or more after project completion. Therefore, for warranty bonds, the evaluation becomes only a hope. Instead of an underwriting that is based on facts, the surety companies are hoping that the contractor not only remains operationally viable over the course of the obligation but also continues to have the necessary financial strength. Any warranty work that the contractor has to do must be financed from working capital and net worth because no payment is expected from the owner to complete that warranty work. Therefore, the surety companies indicate that even if the contractor is still in business, his future work program could be jeopardized by possible maintenance costs on a warranty project, since these costs become out-of-pocket expenses that will negatively affect the contractor's working capital. Hence, there is a potential danger that default on a warranty project could ultimately jeopardize the whole company, which, in turn, would cause severe problems to the surety.

At this point, the interviewees were asked about their reasons for issuing warranty bonds in spite of the associated high level of risk. All the interviewees agreed that the sole reason for writing warranty bonds for anybody is that surety companies want to respond to the competition and hold on to their market share. According to the interviewees, sureties are issuing warranty bonds out of fear of losing large premium producers in the business and are not issuing them because of good and sound

Table 1. Average Risk Scores for Different Types of Warranty Projects

Project type	Number of responses	Average risk score
Asphalt pavement (3" or greater)	8	6.5
Asphalt pavement (other overlays)	7	7.9
Concrete pavement	9	5.0
New deck	9	4.8
Deck overlay	9	6.3
Bridge paint	7	8.1
Microsurfacing	7	7.0
Chip seal	8	6.5
Hot-in-place recycling	6	5.7
Saw & seal	7	5.0

underwriting practices. Similarly, as discussed in subsequent sections, small contractors that do not generate much premium to the bonding company are eliminated from the process even if they are in a satisfactory financial position.

The study also tried to obtain information on factors that sureties consider important for determining the probability of failure on warranty projects. One respondent indicated that level of inspection, geographic conditions, and owner involvement are important risk factors. However, the same respondent also indicated that most factors are not known until after the project is completed. Another respondent indicated that sureties mostly rely on the contractor's risk assessment of the specific project and previous experience with the proposed work type, because no industry empirical data relate to warranty work. The same respondent counted size and type of project, specific site conditions, pavement base, and pavement mix among possible risk factors.

Additional risk factors cited by other respondents include changed traffic patterns (heavier than expected traffic volume), adverse weather conditions, and the use of chemicals and equipment for clearing snow and ice. Some respondents also emphasized the importance of fair written specifications as a factor. Similar results were obtained from the interview survey. According to the sureties, it is acceptable for the contractor to be held liable for an inadequate job whether it is a bad mix, bad placement, or anything else over which the contractor has control. However, the interviewees indicated that determining the loading on the pavement, excessive weather conditions, and excessive wear and tear is impossible. Hence, if the specifications are written in such one-sided manner that the contractor is held responsible for a little crack many years after the asphalt is put down, it would not be fair to the contractor and the surety industry would not be comfortable backing that up.

The survey respondents were also asked to evaluate the risk levels of different types of warranty projects irrespective of contractor capabilities. The respondents based their evaluations on a predetermined risk scale ranging from 1 to 9, where 1 and 9 represented the lowest and highest risks, respectively. As shown in Table 1, new deck projects received the lowest risk score, whereas bridge paint projects were considered to be the most risky projects.

Similar to the previous evaluation, the respondents also quantified the importance of several risk factors for warranty bond decisions. Again, the scale ranged from 1 to 9, where 1 and 9 represented the lowest and highest levels of importance, respectively. As shown in Table 2, the respondents identified the warranty period as the most important risk factor, whereas such

Table 2. Relative Importance of Different Risk Factors for Warranty Bonds

Risk factor	Number of responses	Relative importance
(a) Project characteristics		
Type of project	9	7.9
Size of project	9	7.0
Construction period	9	5.4
Contractual methods	9	5.0
(b) Warranty characteristics		
Amount of Warranty bond	9	7.7
Warranty period	9	9.0
Warranty specifications	9	7.0
Risk of innovation	9	4.6
(c) Design characteristics		
Probability exceeding design traffic	6	5.3
Preexisting conditions	6	5.0
Contractor control over design	6	5.7
(d) Contractor characteristics		
Reputation	9	7.7
Project experience	9	8.6
Performance	9	8.6
Credit history	9	7.4
Capacity	9	8.3
Financial strength	9	8.8
Current workload	9	5.0

basic contractor risk factors as financial condition, experience, performance, and capacity still appeared to be very important. Additionally, during the interviews, surety companies indicated that the continuity plan of the contractor becomes more important for long-term obligations, and sureties are more comfortable if the contractor can describe how he or she plans to manage the continuity of the company over the course of the obligation. The surety companies also emphasized the importance of a strong relationship between the contractor and his surety. According to the interviewees, the companies that work with the same surety for a long time and establish a strong relationship can obtain warranty bonds much more easily than relatively new customers.

The survey respondents also provided information on the basic pricing structure of maintenance bonds, including long-term warranty bonds. Although general practice may vary from company to company, the general practice in the surety market is that there is no additional charge for a maintenance bond of 12 months or less, if a performance/payment bond was also written for the project. For periods longer than 12 months, a flat annual charge is based on the amount of work guaranteed. However, the interviewed surety companies indicated that the additional charge for warranty bonds is insignificant and that the contractor's ability to qualify for a warranty bond and the bonding company's willingness to provide long-term warranties, as well, are more important.

Six of eight sureties (74%) indicated that disputes might increase greatly because of warranty provisions, whereas approximately 13% indicated a slight increase and 13% indicated no observable effect. Similarly, the interviewees indicated that an extended duration complicates sorting out responsibility, which, in turn, may greatly increase disputes on contracts. The interviewees also indicated that disputes are expected to occur more

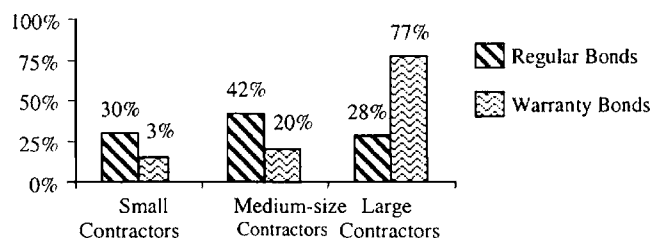


Fig. 1. Distribution of regular and warranty bonds among contractors

frequently in the future, as the relatively young warranty programs of many states in the United States begin to age and as contractors are called on to maintain the works. Some interviewees also indicated that warranty contractors are paying more attention to specifications of the product being constructed. For example, any time that an owner rejects a suggested improvement, the matter is documented and filed for future reference in case it is needed for a legal defense.

Small Contractors and Warranty Bonding—Surety Perspective

The questionnaire survey and the interviews gathered general information on the effect of warranty provisions on small contractors with respect to bonding. Classification of contractors by sureties, the probability that small firms would be eliminated from warranty projects, average distribution of regular and warranty bonds among different-sized contractors, and the reasons for the rejection of small contractors by sureties were the main issues of concern.

To be able to draw concrete conclusions about the impact of warranty provisions on different sizes of companies with respect to bonding, the respondents were asked about their classification of small, medium-sized, and large contractors. Most of the nine survey respondents (71%) indicated that according to their classification, contractors with annual sales of less than \$5 million were considered to be small contractors, whereas contractors with annual sales between \$5 and \$25 million were considered to be medium-sized contractors. Accordingly, sureties considered contractors with sales of more than \$25 million a year to be large contractors.

Sureties were asked about the probability that small firms would be eliminated from warranty projects from the surety and bonding perspective. Eight out of nine questionnaire respondents (89%) indicated that small firms are very likely to be eliminated from warranty projects. Similarly, some interviewees also indicated that discrimination against small contractors for warranty bonds already exists.

Sureties also provided an estimation of the distribution of regular and warranty type of bonds among small, medium-sized, and large contractors on typical highway projects. The data regarding this distribution provided by nine questionnaire respondents coincided with the results of the previous question; that is, sureties indicated that small firms are very likely to be eliminated from warranty projects. As shown in Fig. 1, about 30% of the total regular bonds were issued to small contractors, as compared with only 3% of warranty bonds. The survey also revealed that about 77% of warranty bonds were written for large contractors, whereas there was almost an equal spread among different sizes of contractors for regular contract bonds. Furthermore, one interviewee indicated that his company writes warranty bonds for

small contractors only if the contractor is not going to perform the work but is going to subcontract it to another contractor that, in turn, has to provide the surety with another warranty bond covering the risk of the surety.

As a follow-up to the previous two questions, sureties were asked about possible reasons for rejecting an application for a warranty bond from a small contractor. All respondents were unanimous in their opinion that small contractors typically do not have the required financial strength for long-term obligations. Sureties identified the limited capital base and financial resources to respond to potential warranty claims in the distant future as the major disadvantage of small firms. According to the respondents, bonding companies are therefore not interested in supporting a small company's small balance sheet for a three-to-seven-year period without ability to reunderwrite on a periodic basis. Sureties also indicated that as a result of this practice, over the long term, only the largest and financially strong contractors would qualify for warranty bonds. Many contractors who are more than capable of undertaking the construction may be prevented from bidding a job because of their inability to obtain the necessary warranty bonds, which would significantly hurt the growth and development of new, qualified contractors and would concentrate DOT work among a relatively few privileged firms.

Recommendations by Sureties for Warranty Bonds

This section summarizes the opinions and recommendations provided by sureties to establish a better bond requirement that would decrease the surety's risk over the course of the warranty obligation. The sureties focused mainly on three alternatives to make warranty bonds more attractive to bonding companies, including the duration of warranties, renewable bonds, and treating warranty as a separate line item of the project.

As previously discussed, sureties claimed that guaranteeing that a firm will be in business for three years or longer is impossible. All the surety companies stated that current warranty durations are very long and should be decreased. The sureties preferred two to three year warranties, and limiting warranties to three years was also recommended in the position statement of the SAA (SAA 2001).

Sureties also recommended that warranty bonds should be renewable annually by the surety if state DOTs must consider warranty obligations longer than two or three years. According to the surety companies, for a renewable bond, a surety would have the opportunity to assess the contractor's performance and financial strength, make a judgment on the contractor's operations for the next year, and determine whether to renew the bond.

As previously discussed, sureties indicated that any warranty work that a contractor has to do comes out of working capital because the contractor is getting no money from the owner to do that warranty work, which, in turn, could jeopardize the current work program of the contractor. From this perspective, sureties indicated that the contractor should not be paid for the warranty requirement before the obligation is fulfilled and that the warranty should be a separate line item of the project that consists of the estimated cost to perform the warranty obligations. In this approach, sureties indicated progress payments based on completing the warranty period as an ideal financial incentive to ensure successful delivery of the warranty provision. According to the sureties, under this arrangement, the contract balances would be available to protect the DOT and the surety in the event

that the contractor fails, in addition to providing an additional incentive to the contractor to address the DOTs' warranty concerns in a timely manner.

Conclusions

This Forum provided an insight into the concerns of surety companies with respect to warranty provisions on state DOT projects and identified several areas that require further research and development. The study revealed that sureties need to spend more time and effort evaluating warranty bonds than on performance/payment bonds, although both warranty and nonwarranty bond decisions are based on the same conventional decision variables of underwriting. Sureties indicated that any warranty work that the contractor has to do comes out of the contractor's working capital because no payments are coming from the owner to cover the warranty work. The additional premium charge for warranty bonds is considered to be insignificant by sureties and what matters most would be the contractor's ability to qualify for a warranty bond and the bonding company's willingness to provide long-term warranties.

The survey revealed that only 3% of warranty bonds were written for small contractors, compared with 77% for large contractors. Surety companies were unanimous in their opinion that small contractors typically do not have the required financial strength for long-term obligations. Sureties identified the limited capital base and financial resources to respond to potential warranty claims in the distant future as the major disadvantage of small firms.

Acknowledgments

This study was part of research supported by the Ohio Department of Transportation (ODOT). The opinions and findings expressed here, however, are those of the authors alone and not necessarily the views or positions of ODOT.

References

- Bayraktar, M. E. (2003). "A Scoring Approach to Construction Bond Risk Assessment." MS thesis, Purdue Univ., West Lafayette, Ind.
- Bayraktar, M. E., Cui, Q., Hastak, M., and Minkarah, I. (2004). "State-of-practice of warranty contracting in the United States." *J. Infrastruct. Syst.*, 10(2), 68.
- Hastak, M., Minkarah, I., Cui, Q., and Bayraktar, M. E. (2003). "The Evaluation of Warranty Provisions on ODOT Construction Projects." *Rep. No. FHWA/OH-2003/19*, Ohio Dept. of Transportation, Columbus, Ohio.
- Hughes, K. (2002). "Today's surety bond environment." (www.gibsonins.com/Newsletters/PunchList/2002-Fall.pdf) (May 21, 2003).
- Krebs, S. W., Duckert, B., Schwandt, S., Volker, J., Brokaw, T., Shemwell, W., Waelti, G. (2001). *Asphaltic pavement warranties, Five-year progress Rep.*, Wisconsin Department of Transportation, Madison, Wis.
- Ness, S. D. (1996). "Extended warranties and the surety's dilemma." (<http://www.surety-canada.com/design/xwarranties.html>) (May 25, 2003).
- Surety Association of America (SAA). (2001). *Statement Concerning Bonding Long-Term Warranties*, SAA, Washington, D.C.