Albert R. Wilson

Probable Financial Effect of Asbestos Removal on Real Estate

Government legislation has focused attention on asbestos, and careful consideration must be given to its effect on real estate values. In this article, an analysis of a methodology that can be used to estimate the effect of asbestos on market value is presented. A proper asbestos maintenance plan and careful planning of the removal can greatly reduce the adverse financial effect on property values.

To analyze the probable effects of asbestos on a possible purchase or sale of a property, a model was constructed based on historical data available from an existent small commercial structure. The owners in this model desired a 13% rate of return on investment. It was decided to ignore all issues peculiar to real estate and examine the property's rate of return as if it were generated by a normal business enterprise; that is, to look only to the normal discounted cash flows (DCFs) that would result from owning and operating the property. Although the tax laws indicate a longer depreciation term, a 19-year term was used. This article focuses only on the consequences of the existence of asbestos in a property and the three available strategies for dealing with it; namely, immediate removal, staged removal over time, and careful maintenance and control until removal at a much later date.

Asbestos removal costs were estimated by a highly competent contractor in June 1988. Although there are many published figures on removal costs, these costs are extremely volatile. Consequently, any estimate of cost must be considered in terms of the date at which it was made. Also, because published data contain many unspecified assumptions, such information must be used cautiously.

The latter is best illustrated by the fact that published data for removal costs often include an estimation factor per linear foot of pipe for removal of pipe containing asbestos lagging. What is often not stated is that the cost is for a certain diameter of pipe (often not specified) that can be reached

Albert R. Wilson is president of Hazardous Materials Institute, Inc., Columbus, Ohio, which performs research and consulting in hazardous material inspection and management planning. He has an MBA from Bowling Green State University and a BS in engineering from Northwestern University.

without scaffolding or other special equipment, and is in an area that is part of the required negative air enclosure associated with a much larger project. Unless all of these stated and unstated conditions are observed, the estimation factor is meaningless. Therefore, I have chosen to use an estimate provided by a contractor without stating precisely how that estimate was calculated.

It was indicated in the preliminary analysis that the greatest negative effect on property value would result from a decision to remove asbestos from the building within the next several years. This decision could result in a value decline from 30% to 50%. A decision to remove asbestos either at a much later date or slowly over time while carefully maintaining the material in a safe condition should result in a lesser decline in value, from 15% to 26%.

Both of these strategies include the probable effects of a decline in revenue resulting from the presence of asbestos in a building. In certain markets, this income reduction could range from 10% to 15% compared with rental rates of space containing no asbestos. These results also include the increased operating costs resulting from proper maintenance of the asbestos materials. This increase in operating costs may range from 5% to 15%, depending on the historic operating costs of the building.

Operating and maintenance costs are based on the experience of schools, which are required by law (Asbestos Hazard Emergency Response Act of 1986, or AHERA) to maintain their asbestos inventories in a safe condition through a specifically defined Operations and Maintenance Program (O&M program). This requirement, embodied in the Code of Federal Regulations (CFR) at 40 CFR 763, will probably be held by the courts to be the minimum stipulation for all buildings, public and private, containing asbestos.

Experience has shown that normal pricing factors for asbestos removal are no longer applicable. Consequently, three asbestos-removal cost scenarios were constructed and used in the evaluation of the alternative removal models.

Because experience has shown that normal pricing factors for asbestos removal are no longer applicable, three asbestos-removal cost scenarios were developed—normal, AHERA, and AHERA + mortgage.

In the first, the normal cost scenario, it was assumed that the costs for removal were similar to those of any other product or service. Costs are initially high when the product or service is new, but decline over time with the advent of new technology, experience, and the entry of more firms into the marketplace.

In the second scenario, AHERA cost, attempts were made to factor in the very high demand from schools for removal services. Schools want to remove the asbestos as soon as possible regardless of the fact that the federal rules and regulations specifically discourage such action. This has caused a demand for removal services far in excess of both the supply of competent contractors to perform the service and the normal gestation period required to develop improved removal technology that could possibly reduce costs.

In the third scenario, AHERA + mortgage cost, attempts were made to factor in the additional demand generated by the reaction of mortgage lenders (some estimate as many as 37%) who refuse to lend to a party whose building contains a significant amount of asbestos. To the extent that this attitude continues or accelerates, the cost for removal will be driven even higher and remain high for a longer period than indicated by the AHERA cost scenario.

A summary of the analyses is contained in Tables 1 and 2, and Figure 1.

TABLE 1 Rate of Return on Investment for Various Sales Prices and Removal Timing and Cost Scenarios

(sales prices in $1,000s)							
Sales price	800	750	700	650	600	550	500
Base model (%)	**12.9**	**14.7**	16.7	19.2	22.2	26.1	31.0
End removal model (%)							
Normal removal costs	9.6	10.8	**11.3**	**13.9**	16.0	18.7	22.1
AHERA removal costs	9.7	10.8	**12.1**	**13.9**	15.9	18.7	22.1
AHERA + mortgage costs	9.4	10.7	**11.9**	**13.7**	15.8	18.5	21.9
Staged removal model							
Normal removal costs	9.1	10.1	11.3	**12.6**	**14.1**	16.0	18.4
AHERA removal costs	8.6	9.6	10.6	**12.0**	**13.6**	15.5	18.0
AHERA + mortgage costs	7.8	8.7	9.8	11.0	**12.6**	**14.3**	16.8
Initial removal model	8.0	8.8	9.7	10.5	11.7	**12.9**	**14.2**

NOTE: The percentages in boldface bracket the desired rate of return (13%).

ANALYSIS METHODS

Initial financial assumptions

Throughout the analysis, a number of financial assumptions were maintained. First, it was assumed that the real estate would be held in a normal, for-profit corporation with all income, expenses, and taxes based on that assumption. A straight-line depreciation schedule of 19 years to a zero salvage value was assumed, as was a tax rate of 34% with unlimited tax-loss carry-forward. The purpose of this set of assumptions was to separate the analysis from any peculiarities of real estate investment to allow direct comparison of results from all of the models.

Further, it was assumed that the property would increase in value at a compounded real rate of 2% per year, and that normal operating costs would increase at a real rate of 4% per year. Income from rentals is assumed to increase by a compounded rate of 5% per year.

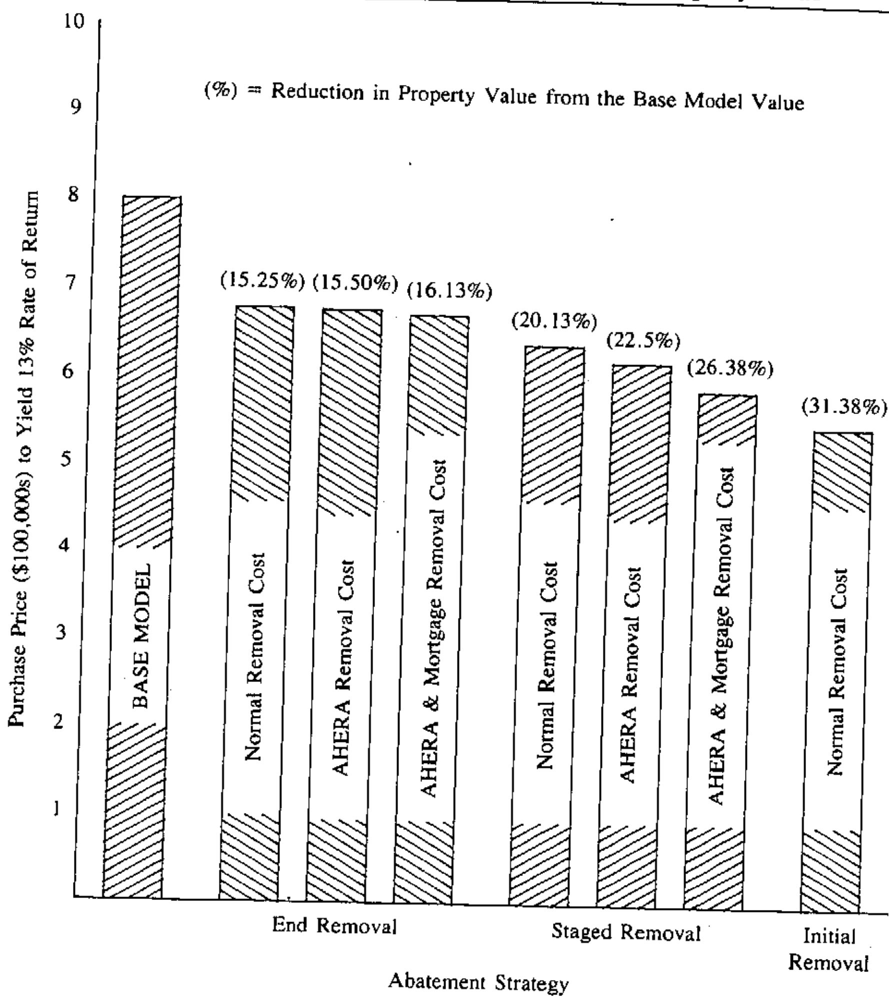
It was also assumed, based on the building's historic data, that 10% of the space was vacant at any one time as a result of the normal turnover of tenants and existent market conditions. This is implicitly included in the initial rental income figures.

The building was renovated in 1985; thus, additional extensive renovation was not immediately required. The cost of future renovation (i.e., the nonasbestos por-

TABLE 2 Required Sales Prices for a 13% Rate of Return

Model or Scenario	Sales Price ($)
Base model	800,000
End removal model	
Normal cost	678,000
AHERA cost	676,000
AHERA + mortgage cost	671,000
Staged removal model	
Normal cost	639,000
AHERA cost	620,000
AHERA + mortgage cost	589,000
Initial removal model	549,000

FIGURE 1 Effect of Asbestos Abatement Strategies on Property Value



tion of such renovation work) was assumed to increase by a compounded rate of 4% per year.

An initial investigation of the building produced the following data.

- Asbestos is in the form of both sprayed-on fireproofing on structural steel, and thermal insulation on boilers and piping throughout the building.
- The costs for removal and disposal alone will be $70,000, assuming that the materials have been exposed by prior demolition of inner wall and ceiling materials, and that replacement of the wall and ceiling materials will be accomplished under a separate contract.
- The cost of demolition of the existent wall and ceiling materials, functional replacement of the materials containing asbestos, and installation of new wall and ceiling materials and floor coverings will be $140,000.

It was also assumed that renovation costs may be capitalized at the time of occurrence and funded at the rate of 80%, through commercial loans with the same term as the original mortgage. The original mortgage rate was assumed to be 10%, and additional mortgage borrowings would carry the same rate. Any cash operating deficits and cash needed to meet unfunded renovation and asbestos removal costs were assumed to result in ad-

For purposes of analysis, models based on the timing of removal of asbestos were established—base, initial removal, staged removal, and end removal.

ditional contributions to capital investment on the part of the owners. The building will be sold in the 20th year.

The renovation costs were assumed to contribute to an increase in building value at the rate of 100% of the cost to renovate, but the cost of asbestos removal was assumed to be an expensed item contributing nothing to the value except the enhancement of the income potential of the space.

Base model

The base model was constructed from the historic records of the building, and asbestos-related issues were completely ignored. It was determined, using normal DCF techniques, that a sales price of $800,000 would result in a probable rate of return on investment of 13% to new owners. This was considered to be a reasonable rate of return for the market.

In this model, all of the abovementioned basic assumptions about the appreciation of values, income potential, operating cost behavior, and mortgage costs were used.

Initial removal model

The initial removal model was built from the base model in that it was assumed that the new owners would immediately on purchase remove all asbestos and, in so doing, completely renovate the building. Thus, the new owners would forego income from the building for the first year of ownership but would experience normal income and operating costs from that point forward.

The question of which asbestos removal cost scenario is applicable is not an issue in this model. Nevertheless, it was inferred from preliminary analysis that if a delay of a year or two in implementing this strategy occurred, the removal cost scenarios would heavily influence the building's value. From an initial calculation it was found that if the AHERA + mortgage scenario was applied, a delay of two years would reduce the value of the building by more than 50%, as opposed to the 31.38% reduction shown for an immediate implementation of an initial removal action.

The removal timing assumptions, revenue growth, and operating cost assumptions are graphically displayed in Figures 2, 3, and 4.

The staged removal model

The staged removal model is the most complex. Using this model, one assumes that as space becomes vacant (approximately 10% per year) renovation and removal will take place before the space is returned to the market.

In this model, it was assumed that costs are incurred for renovation and removal, with the effects of attendant capitalization, expense, mortgage, and cash flow experienced at various times in the future. Over time, less and less unrenovated space will be made available through tenant turnover, and at some point the vacant space available needing renovation or removal will fall below a minimum level for economic renovation or removal. It was decided to set a limit such that when 20% of the original asbestos-filled space remained, the balance would be vacated and the work completed. This would occur in the 16th year.

During the period when space containing asbestos remains in the building, the income from that space will be reduced by 12.5%; the operating costs will increase by 10% in recognition of the special requirements of the O&M program.

In this model, like the end-removal model, all three removal cost scenarios were used to analyze their effects on the rate of return on investment.

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FIGURE 2 Revenue for Removal at Purchase

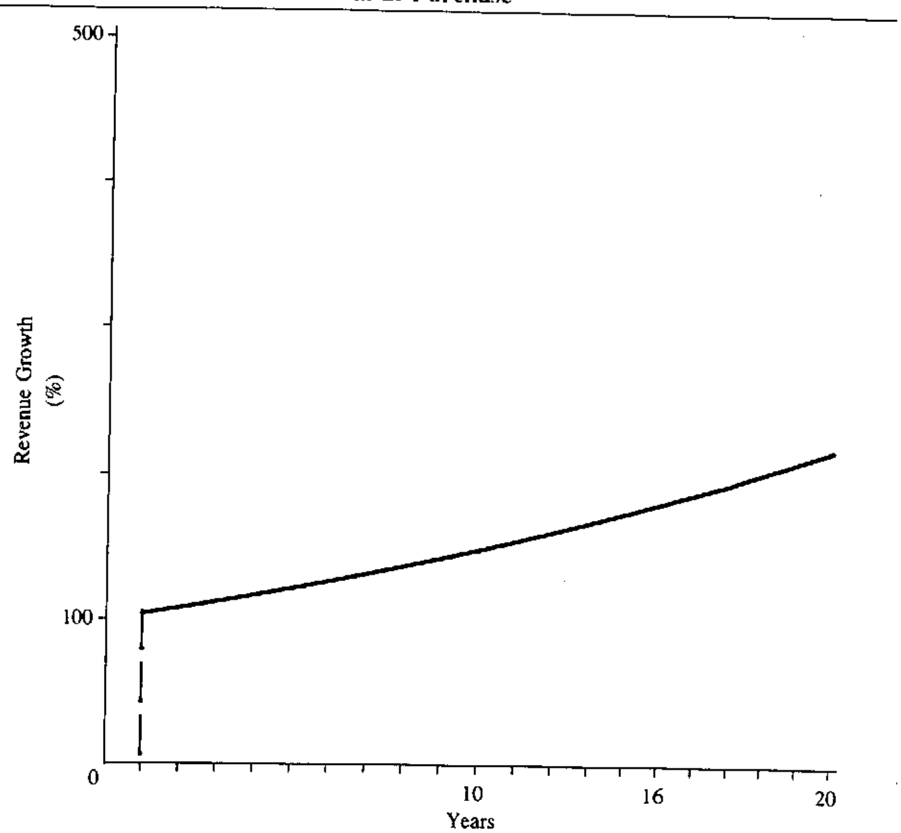


FIGURE 3 Operating Cost for Removal at Purchase

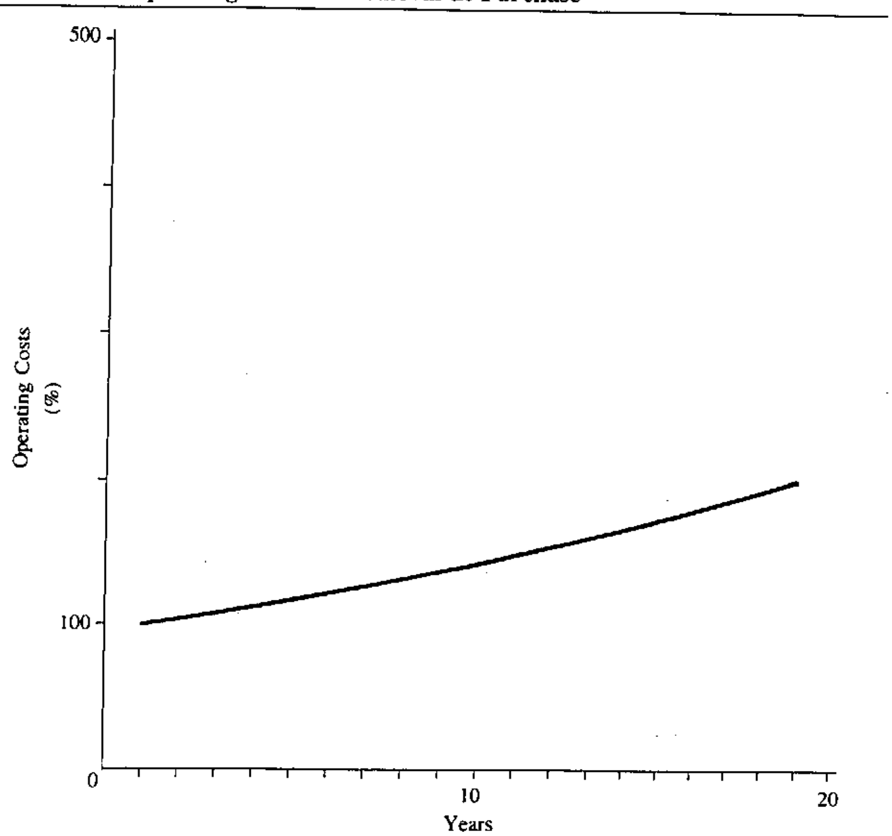
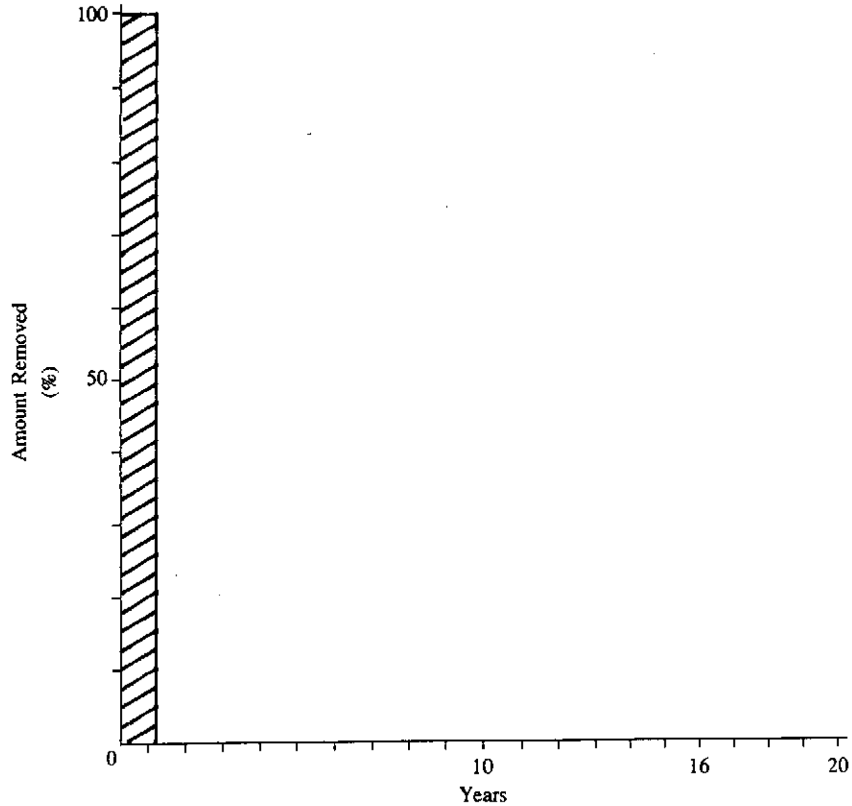


FIGURE 4 Timing for Removal at Purchase



The removal timing, revenue growth, and operating cost assumptions for the staged removal model are displayed in Figures 5, 6, and 7.

The end removal model

With the end removal model, it was assumed that nothing would be done to remove asbestos or renovate space containing asbestos until the 16th year, at which time all of the space would be renovated and the asbestos removed. The income from rental, however, would be reduced by 12.5% from normal market rates, and the operating costs would be increased by 10% above normal operating costs for the entire period prior to the 16th year.

The removal timing, revenue growth, and operating cost growth assumptions for the end removal model are shown in Figures 8, 9, and 10.

REMOVAL COST SCENARIOS

The removal cost scenarios are based on the following data.

Normal cost scenario

Under this cost scenario, the market for asbestos removal services behaves in a fashion similar to that of other new products or services. When a new product or service is introduced into the marketplace and it meets with a high level of acceptance, the price is initially fairly high. As demand increases, however, new technology is developed to reduce production costs, experience is gained resulting in more efficient production and less costly distribution, and new competitors appear. All these factors contribute to a decline in real price somewhat equivalent to that shown in Figure 11. This is what could be expected

FIGURE 5 Revenue for Staged Removal

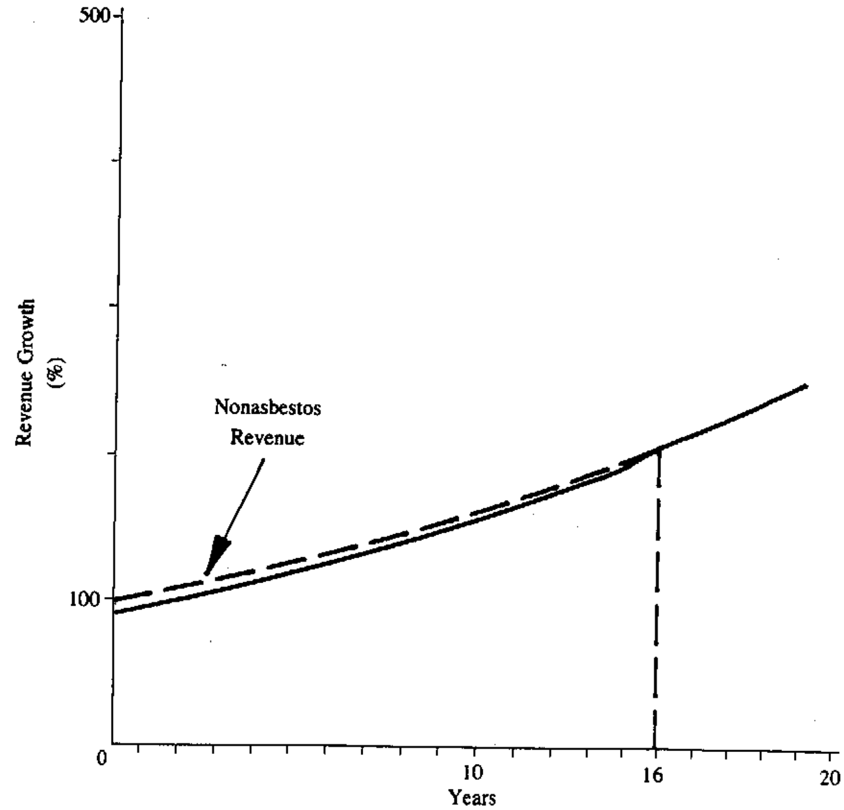


FIGURE 6 Operating Cost for Staged Removal

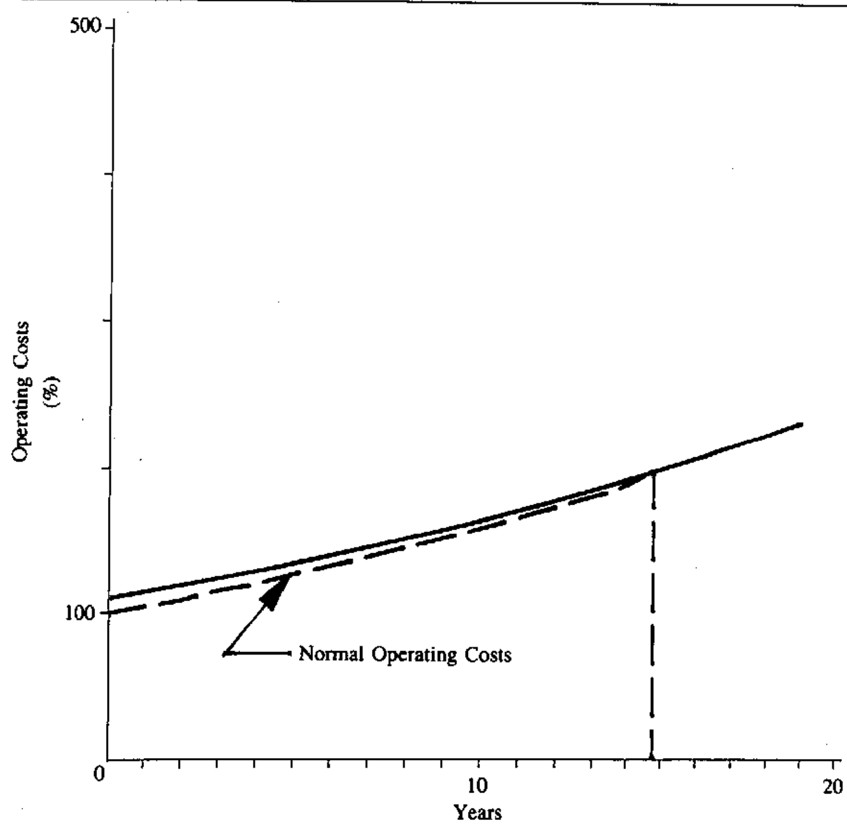


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FIGURE 7 Timing for Staged Removal

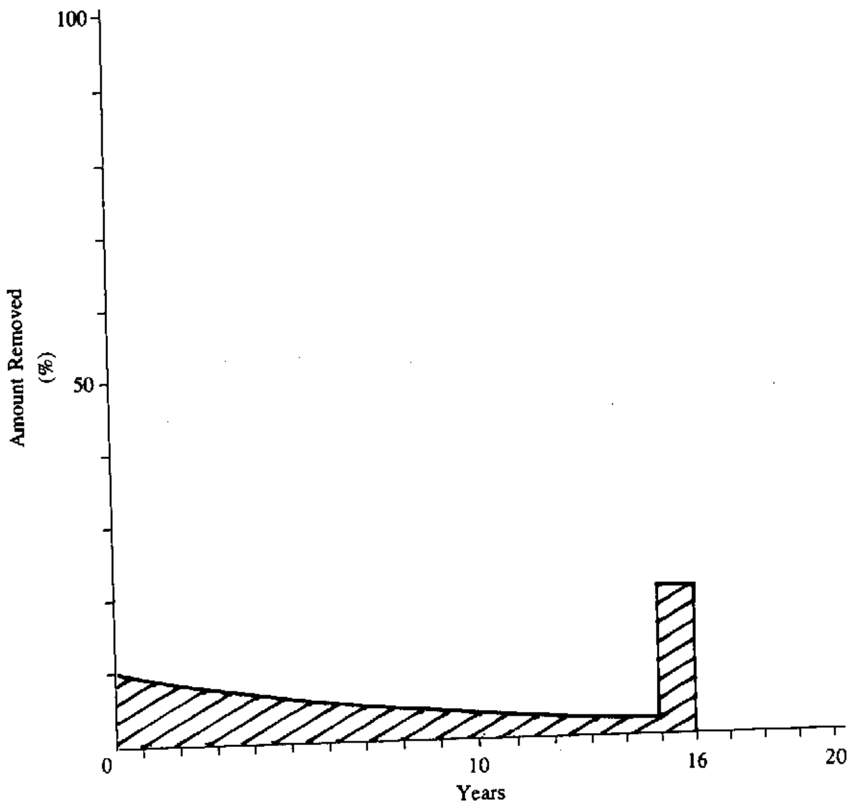


FIGURE 8 Revenue for End Removal

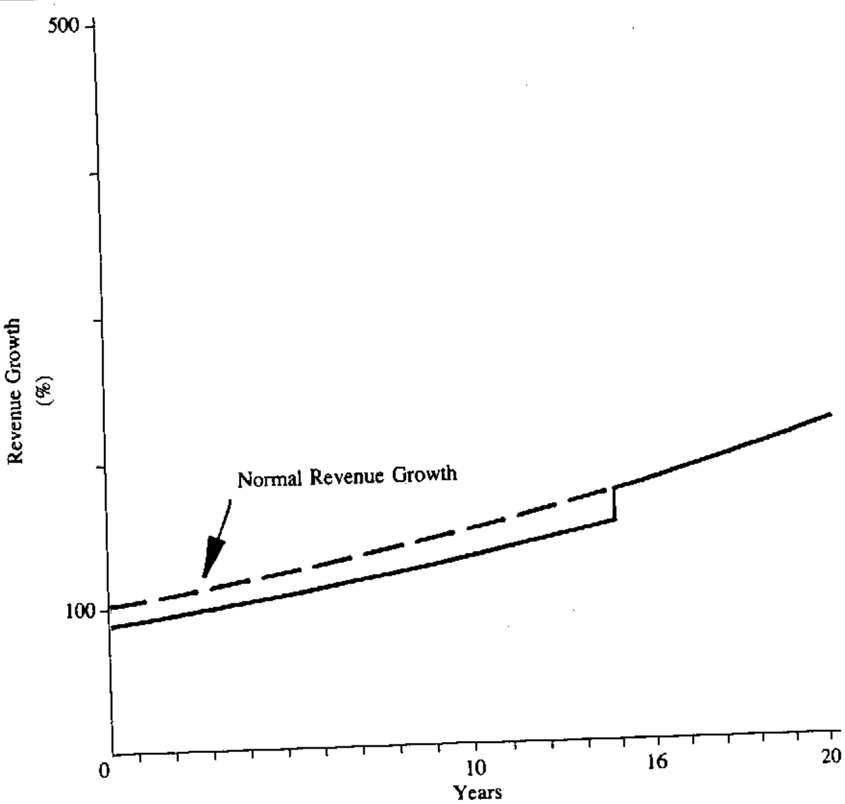


FIGURE 9 Operating Cost for End Removal

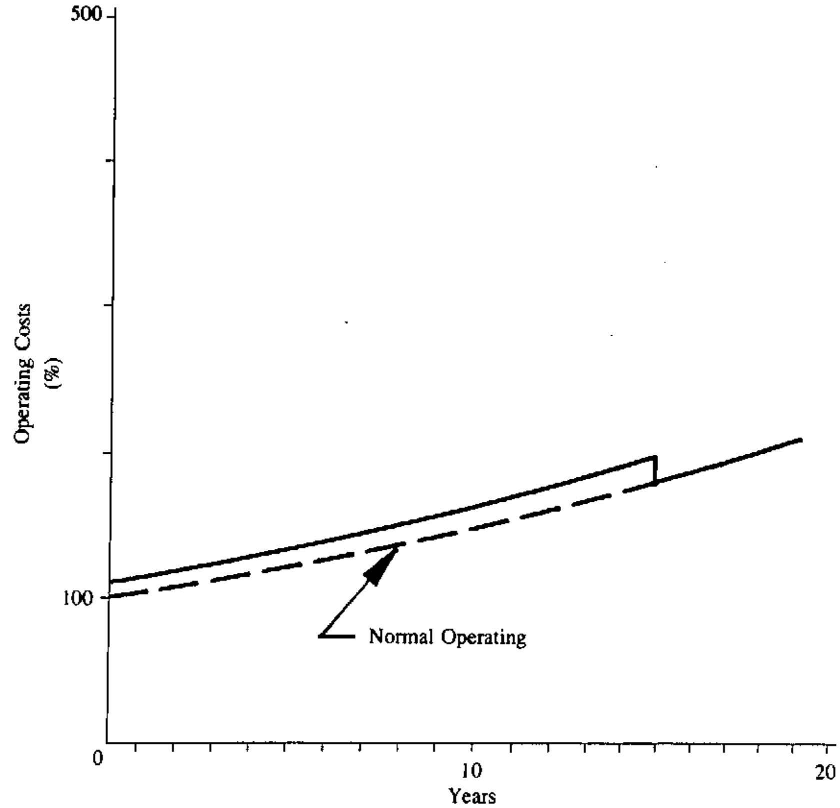


FIGURE 10 Timing for End Removal

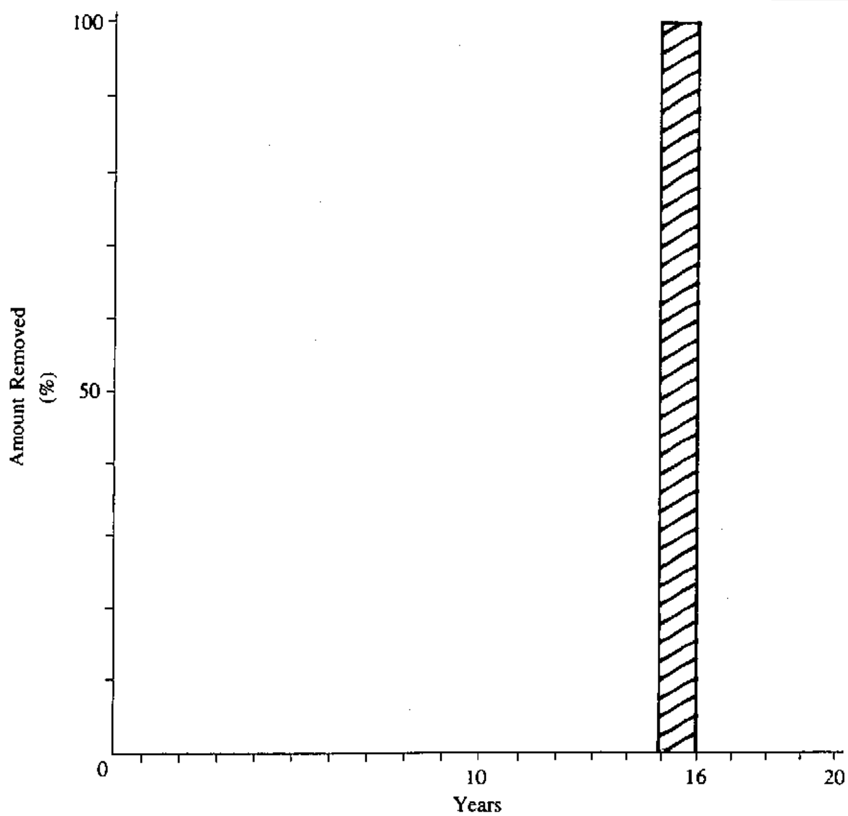
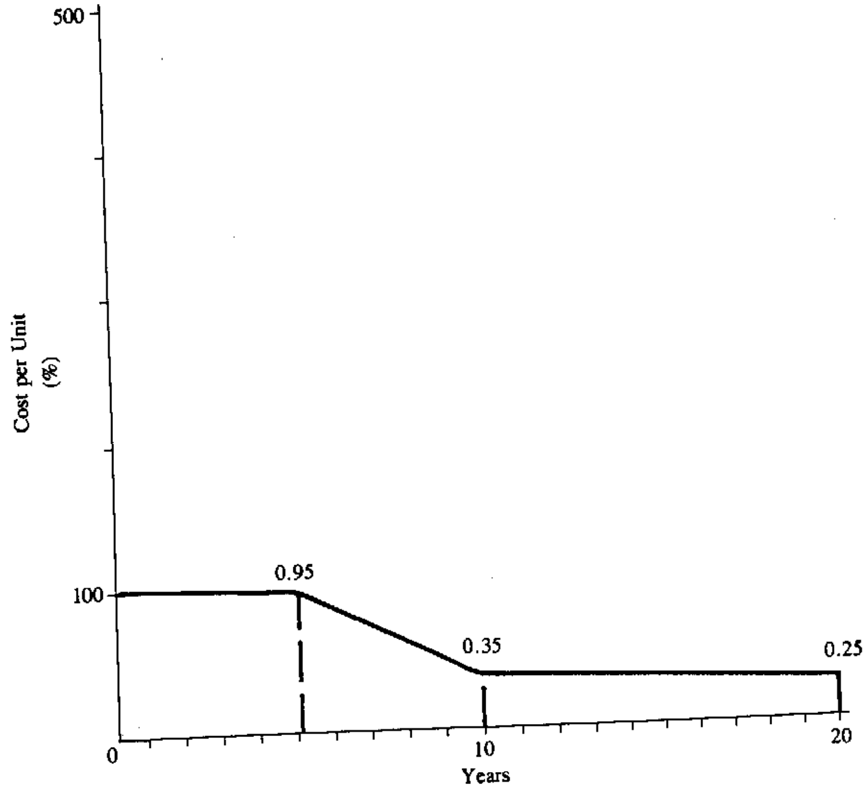


FIGURE 11 Normal Market Cost Behavior Assumption



in the cost of asbestos removal services if the market behaved in a normal manner.

AHERA cost scenario

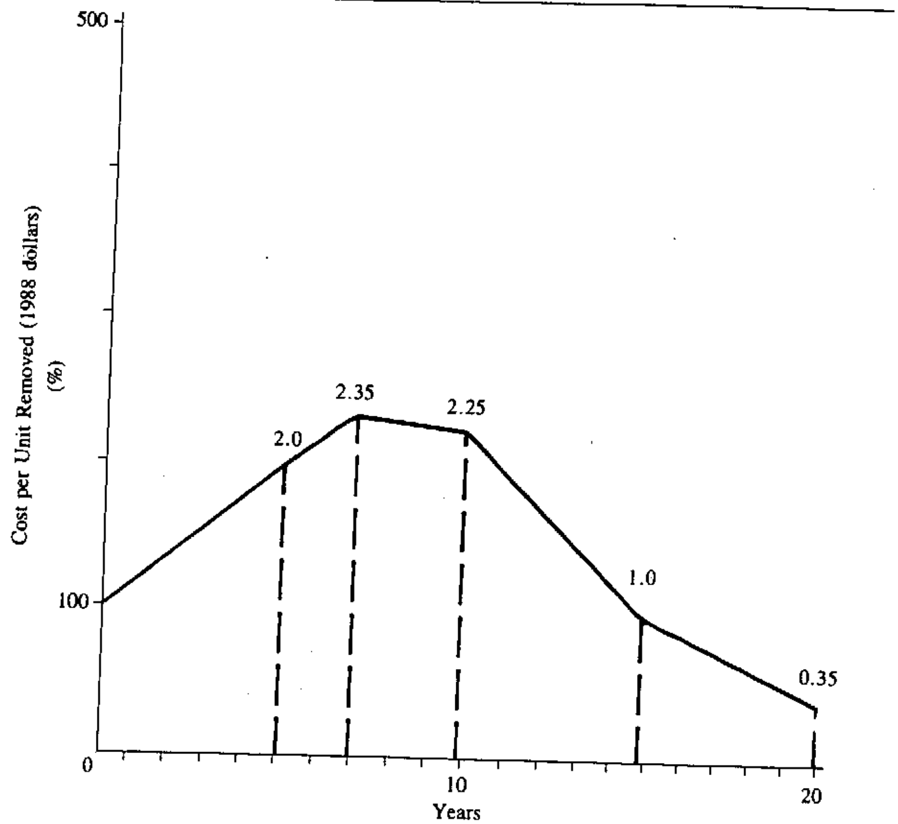
In the asbestos removal market over the past several years, cost for removal has increased by 50% to 100% per year. This fact is recognized in the AHERA cost scenario.

This increase is a result of two major factors. First, an increasing demand for removal services from both the public and private sectors has outstripped the supply of competent contractors. Second, requirements of the new AHERA regulations that went into effect in December 1987 include licensing contractors, workers, and project designers, at least to the extent that they will be permitted to work on school buildings. The regulations also specify the methods and standards under which asbestos removal is to be performed. These factors further restrict the supply of individuals and organizations available to service the demand.

While AHERA rules and regulations apply strictly only to schools, they are viewed by many legal experts as establishing a minimum set of conditions that the courts may reasonably be expected to apply to all building owners or individuals working with asbestos in whatever capacity. Further, AHERA rules and regulations are commonly misunderstood as requiring, or at least forcing through extensive maintenance and documentation requirements, removal of all materials containing asbestos. These factors act both to accelerate demand for removal services and shorten the time in which new technology, experience, and normal competitive forces have to operate to reduce costs.

The net result of AHERA regulations is shown in Figure 12, which displays a continuing in-

FIGURE 12 **AHERA Driving Force**



crease in costs for the next several years, followed by a period of level but high costs, and finally a decline over time in a more normal fashion. The exact quantitative amounts of the increases in costs, or the length of time over which they will apply, is the subject of much debate. Nevertheless, the general shape of the cost curve is agreed on by most experts in the field.

The AHERA + mortgage cost scenario

To the extent that data are available, although fragmentary at this time, it is apparent that mortgage lenders are reacting to the issue of asbestos in buildings in one of three general ways. Some are essentially ignoring the issue and proceeding in a normal fashion. Others are increasing the cost of borrowing through the use of higher rates, higher down payments, escrow accounts to cover removal cost risks, or a combination of these and other devices. Another lender reaction is simply to refuse to lend unless all of the materials are immediately removed. Preliminary indications are that the latter two types of reactions are more prevalent.

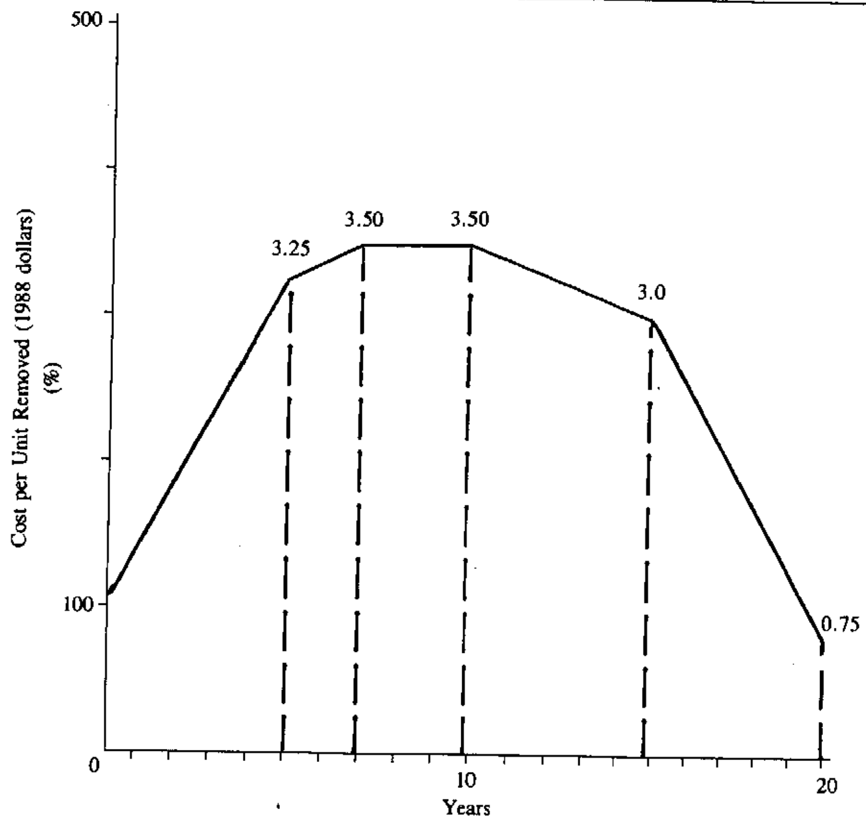
Lender reaction to asbestos in real estate is a relatively new phenomenon and does not seem yet to have fully affected the cost of removal services. For this reason, the AHERA + mortgage scenario, in which the costs for removal services climb and remain at an even higher level for a longer period than the AHERA cost scenario, appears to be a reasonable projection of future costs. This is shown in Figure 13.

Lender reaction to asbestos in real estate is a relatively new phenomenon and does not seem to have fully affected the cost of removal services.

CONCLUSION

In this analysis, an attempt has been made to determine the financially optimum strategy. For example, no recommendation as to whether re-

FIGURE 13 AHERA and Mortgage Policy Driving Forces



moval should be completed before, on, or after the 16th year has been made. In addition, no attempt was made to include elements of liability risk in the analysis. It must be clear that virtually no liability insurance policy covers the risks associated with asbestos in a building.

No costs for examining the building to determine the current condition, extent, or cost-to-cure of any existent asbestos problem have been included in this analysis. Generally, a cost-to-cure analysis of a building will range from $.10 to $.20 per square foot of gross building space. This is particularly the case if the staged or end removal options are selected because of the exacting and detailed documentation of the existent inventory of materials containing asbestos required to operate a successful O&M program.

Without a very exact inventory of the materials present, including careful documentation of the inventory's existent condition, it would be difficult, if not impossible, to prove that an owner is doing all that is reasonable to protect human health and the environment from asbestos-exposure risks. Without such proof, a decision to delay removal is a calculated risk with unfavorable conditions to the owner.

For example, clearly specified in AHERA rules and regulations is the requirement to notify all occupants and short-term workers (telephone repairpersons, plumbers, electricians, etc.) of the existence and location of asbestos and its associated risks. This is nearly impossible without careful initial documentation and a comprehensive, auditable record-keeping system. The simple requirement to notify occupants, unless a positive and creditable risk-control program based on detailed and verifiable data is in place, will probably result in a significant decline in income for a property.

A number of subjects of further research have been outlined by this initial study. The probable future costs of removal services should be investigated. Although the preliminary data from schools regarding the costs of O&M programs are helpful, further data are needed to determine how that experience may apply to commercial space. Of fundamental interest is the development of uniform standards for property inspections that will develop verifiable data for cost-to-cure and O&M program usage.

Finally, a competent examination of a building to develop data for an O&M program is a highly specialized area of property inspection. A number of modern asbestos-free materials look exactly like materials that contain asbestos. AHERA rules specifically require that any material suspected of containing asbestos be assumed to contain asbestos until proved otherwise by specialized sampling and testing techniques. Those not specifically trained to perform this work should not attempt it, both for the sake of their own health and safety and to prevent the possible gross contamination of an otherwise uncontaminated area.

Additional data are needed to determine how schools' experiences with Operations and Maintenance programs can be applied to commercial space.