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MARKETING AND DISTRIBUTION OF PENNSYLVANIA BLUESTONE

Mineral Economics Monograph

By

Wayne G. Mikutowicz and George K. Schenck

December 1970
THE PENNSYLVANIA STATE UNIVERSITY
COLLEGE OF EARTH AND MINERAL SCIENCES

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SPECIAL REPORT 70-3

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CHAPTER I.

MARKETING AND DISTRIBUTION OF PENNSYLVANIA BLUESTONE

Introduction

The Department of Mineral Economics at The Pennsylvania State University, as part of a project for the Small Industries Research group and the Pennsylvania Bluestone Association, has been asked to study the distribution and marketing of Pennsylvania bluestone, a dimension stone which is quarried mainly in northeastern Pennsylvania. The primary emphasis has been focused on delineating the market demand for this commodity, since it was felt that this was the least understood segment of the industry, and that the potential for improved income in the industry might receive a boost from such an investigation.

The Pennsylvania bluestone industry, which is centered mainly in Susquehanna County, Pennsylvania, is relatively small compared to other industries in the region. Approximately 200 full and 400 part-time proprietors and workers in the area are employed in production and preparation of bluestone (Pennsylvania Bluestone Association). Basically, the industry can be classified into three major parts. The first is the producing sector and involves finding, developing, and quarrying of the stone. The second is the distributing sector, usually located in the quarry area. The third is the marketing sector which as the name implies is located near the consuming area. Each of these functions can be carried out by an independent firm or can be totally integrated from quarry to market operations. Such vertical integration occurs in a few cases. There are no set limits on what functions each sector has in
preparation of the stone for final use. In some cases, the stone is totally prepared at the quarry site, while in others no operations past sizing and grading are performed until it reaches the market. Transportation is a vital link among these three sectors and is a factor in determining the market boundaries of the stone.

Relatively little information is available for the dimension stone industry in general about market operations, and none exists for the Pennsylvania bluestone industry. A report published by the Bureau of Mines, entitled Dimension Stone (U.S. Bureau of Mines, Information Circular 8391, 1968) provided a great deal of information with regard to the general nature and problems of the dimension stone industry. Another report by the Bureau of Mines entitled Sandstone As Dimension Stone (U.S. Bureau of Mines, Information Circular 8182, 1963) gives mostly a technical survey of the sandstone industry of which bluestone is a part, but also provides information about geographic distribution of the industry. Stone Magazine (Makens, April 1968) featured a market survey of architects primarily in the midwestern United States for dimension stone in general that provided some insights into analyzing the bluestone industry.

With so little information with which to work the majority of the material used in this report is based upon personal interviews with stone dealers in the market areas, and a survey of 500 architects in what were believed to be the major and peripheral consuming states. These two areas, the market operations, in which the stone dealers play a significant role and the consuming applications, in which the architect performs a major function are, therefore, the basis for analysis in this report. The study has attempted to look into these markets for
bluestone and see what forces are at work in determining such factors as the types of bluestone that are consumed and in what proportion plus the determinants that affect their consumption. The present and future status of the markets for bluestone were also studied to see what could be done to improve the marketability of the stone. The commodity itself was studied from the viewpoint of its comparative advantage to other dimension stones. A separate analysis "Future Strategy", based on the findings of facts contained in this report contains recommendations for future action by the Pennsylvania Bluestone Association.
CHAPTER II.

THE COMMODITY BLUESTONE

Flagstone or bluestone, as it is commonly referred to commercially, is basically a sandstone of the Devonian age. One of its major properties is its ability to be separated readily into uniform layers which are in most cases parallel to the stratification of the rocks. This geologic property thus makes the stone suitable for flagging. The stone has another rather important property which makes it suitable for exterior use. This is its great resistance to wear and its inherent hardness due to its major constituent, quartz. The term bluestone, which obviously implies that the stone is blue in color, is only a general term since the color can be bluish, bluish gray, greenish, or reddish.

Bluestone is quarried in southeastern New York and northeastern Pennsylvania. This report is concerned primarily with the bluestone quarried in Pennsylvania. In Pennsylvania bluestone is quarried in the Endless Mountain region which consists of Susquehanna, Bradford, Tioga, Sullivan, and Wyoming Counties (Pennsylvania Geological Survey, Information Circular 66, 1969). This area is shown in Figure 1. However, most of the bluestone produced comes from Susquehanna County, and all data concerning the quarry sector of the industry were obtained from there.

Major Product Characteristics

There are many terms used in the stone industry which are often a source of confusion to the consumer of the product and can have the effect of making the consumer choose a substitute material. With this
FIGURE 1. Location of Pennsylvania Bluestone Deposits
in mind, it would be desirable to set forth a description of bluestone, its various uses, and the terminology used. This will help to facilitate the discussion later on in the report and will also be of value in clearing up some of the confusion about this subject.

Bluestone can be classified among those rocks that find their principal use as "dimension stone." This commodity class is defined to include a natural rock material that has been quarried to obtain blocks, slabs, or pieces which individually are required to meet size shape specifications (U.S. Bureau of Mines, Information Circular 8391, p. 4). Within the bluestone trade the product is classified primarily by end use and size, also color, type of edge, and surface may be specified by the customer. In addition, producers and dealers recognize two different types of stone lamination - freestone and reedstone - that have an effect on the durability of this dimension stone. Neither texture, which appears to be determined by grain size, nor grain direction, which affect the ease and direction of break, are specified by buyers at any level, except for very special cases.

Table 1 provides a classification of the various types of bluestone, their uses, and the approximate size range encompassed by these uses. The size will vary somewhat among the various dealers but the table presents a general idea of what is available in the market. The sketch accompanying the table indicates the various dimensions referred to in the table.

Color is subjectively gauged into the following classes by the quarrymen: purple, blue-green, gray-green, tan, and red. These color ranges tend to blend into each other and in some cases there may be a
### TABLE 1.

**DESCRIPTION OF TYPES OF BLUESTONE**

![Diagram of bluestone](image)

- **A** = width
- **B** = length
- **C** = thickness

<table>
<thead>
<tr>
<th>Type</th>
<th>Major Use</th>
<th>Rectangular Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flag or Pattern</td>
<td>Interior and Exterior</td>
<td>B=12&quot; to 4' ± 1/4&quot; in 6&quot; multiples</td>
</tr>
<tr>
<td></td>
<td>Flooring</td>
<td>A=12&quot; to 3' ± 1/4&quot; in 6&quot; multiples</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C=1/2&quot; to 3&quot; ± 1/4&quot; in 1/2&quot; multiples</td>
</tr>
<tr>
<td>Tread</td>
<td>Interior and Exterior</td>
<td>B=3' to 8' ± 1/4&quot; in 6&quot; multiples</td>
</tr>
<tr>
<td></td>
<td>Stairways</td>
<td>A=10&quot; to 24&quot; ± 1/4&quot; in 6&quot; multiples</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C=1&quot; to 4&quot; in 1/2&quot; multiples</td>
</tr>
<tr>
<td>Veneer</td>
<td>Interior and Exterior</td>
<td>B=1' to 4' randomly sized</td>
</tr>
<tr>
<td></td>
<td>Facing for Walls</td>
<td>A=2-1/2&quot; to 4&quot; randomly sized</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C=1/2&quot; to 4&quot; randomly sized</td>
</tr>
<tr>
<td>Coping</td>
<td>Topping on Walls</td>
<td>Same as tread but random length</td>
</tr>
<tr>
<td>Sill</td>
<td>Windows</td>
<td>Same as tread, except 6&quot; minimum width</td>
</tr>
<tr>
<td>Wallstone</td>
<td>For exterior retaining</td>
<td>At least rectangular straight edge otherwise</td>
</tr>
<tr>
<td></td>
<td>walls</td>
<td>random shape and measurement</td>
</tr>
<tr>
<td>Slab Stock</td>
<td>Large slabs which are</td>
<td>B=4' and greater</td>
</tr>
<tr>
<td></td>
<td>cut to customers</td>
<td>A=4' and greater</td>
</tr>
<tr>
<td></td>
<td>order in market area</td>
<td>C=1/2&quot; and up</td>
</tr>
<tr>
<td>Specials</td>
<td></td>
<td>Includes Hearthstones and Mantles for fireplaces; Chimney caps, curved pieces and anything else not mentioned above.</td>
</tr>
</tbody>
</table>
change in color on an individual stone. Staining which may occur can usually be removed with oxalic acid.

Surface condition is determined by the appearance of the top and bottom of an individual piece of stone. For all types except veneer, one fairly level and uniform surface is required. A "smooth" surface is a natural one with no high or low points noticeable to the eye whereas a "rough" surface will have numerous randomly distributed highs and lows with an elevation difference of perhaps 0.10 inch.

Veneer must have two good surfaces to provide a uniform mortar joint. On pattern stone it is usually desirable to have one rough surface, if laying in concrete, so that the stone will adhere. When a block of stone is particularly thick, it may be wired sawed into two or more thinner pieces. The cut surface is quite smooth and is referred to as "wire sawed." This type of surface is not desirable for laying in concrete.

The edge on a stone helps to determine the quality of the stone; depending on how many edges of the stone are to be exposed (face edges), and its use. In other words if no edges are exposed the condition of the edge does not affect the quality.

Basically there are five types of edge appearances. These are - sawed edge; snapped edge; pitched edge; machine edge; quarry cut edge; and a sixth type, rock faced. These are defined below:

(1) Sawed edge - produced by a cutting machine, with an abrasive wheel type blade, which results in a smooth, straight edge.

(2) Snapped edge - produced by snapping or breaking the stone by physical means along a scribed line. This results in an edge which is natural looking, clean, and straight.

(3) Pitched edge - produced while "snapping" the stone, the edge will be flared outward, or inward depending on the stone, or it could result in a rounded edge.
(4) Quarry-cut edge - this is a catch-all phrase which includes the snapped and pitched edge.

(5) Machine edge - this is produced by a guillotine-type cutter, which gives a very rough rounded edge.

(6) Rock faced - this is produced by hand tooling of the stone surface usually by the mason on a veneer type of stone. Here the surface face of the stone is chiseled or gouged to give the appearance of a quarry-cut "edge" to the stone surface to provide size contrast in a veneer wall. The rock-faced stone may be 6" or 8" wide.

There apparently is some subjective distinction in stone grade based on uniformity of characteristics within a pallet load of stone. The bulk of stone sold meets some quality standard established through time by the particular seller. His customers may then ask him for his "Number 1" stone which would be high quality stone, or the buyer may accept off-grade material for a price concession. "Number 1" stone will be uniformly sized, have a good surface, will not have reeding and will have uniform color.

There are some other characteristics of bluestone that will determine its quality. The terms freestone and reedstone are usually applied to the general structure or coherence of the stone. Freestone is a stone that is very coherent in structure, tending not to show any joints parallel to the bedding. Reedstone, or a stone that is referred to as reedy, is a stone that is clearly not coherent in structure and has many separations parallel to the bedding.¹ In time, due to the action of freezing and thawing, reedstone will split apart. It is considered an inferior type of stone by all sectors of the industry.

¹This is due to the environment in which the deposition of detrital material occurred in the ancient seas.
The texture of bluestone can vary from a fine-grained appearance to that of a coarse grain; however, this is not usually included in a description of the stone by the bluestone industry.
CHAPTER III.

STRUCTURE OF THE BLUESTONE INDUSTRY

Quarrying

The producing or quarrying sector forms the basis of the entire bluestone industry. The quarrying of bluestone has been carried on probably for over a 100 years. The first quarries were operated in and around Ulster County, New York. It was here that this dimension stone received the name bluestone, due to the bluish color of the stone in this quarry (U.S. Bureau of Mines, Bulletin 124, 1917, p. 93). As demand for bluestone increased, the area of supply shifted into other sections of New York and northern Pennsylvania. Since there was no concrete at this time, bluestone made a most suitable material for paving and curbing. This was the primary reason for the growth of the industry in its early stages. During this period the quarrying area of northern Pennsylvania employed approximately 1,000 people, thus establishing itself as a major industry in this area (U.S. Bureau of Mines, Bulletin 124, 1917, p. 1). With the development of portland cement, the substitution of concrete for bluestone was imminent, and eventually bluestone became only a marginal product for highway uses. After the loss of this major market and further adjustments which occurred around 1906, the bluestone industry stabilized its structure which has not changed significantly since then.

At present, the quarry sector employs approximately 200 full-time proprietors and workers plus 400 part-time and seasonal workers (Pennsylvania Bluestone Association, Personal Communication). It is
difficult to obtain an accurate estimate of the actual number employed in the quarry areas since many of the people quarry only as a secondary source of income. For instance, farmers who have stone deposits on their land will quarry stone when they have time and are able to. Due to this factor, the labor force available for quarrying will fluctuate widely, sometimes acting as a constraining factor in producing an adequate supply of stone. The approximate hourly wage for workers ranges from $2.75 to $3.00 plus coverage for government insurance programs.

The resource base for bluestone is the formation which exists in New York state as well as Pennsylvania. This formation exhibits variability characteristics throughout the two-state region and is only infrequently of suitable quality for quarrying. For example, one quarried deposit may consist of quality stone (no reediness) while another quarry approximately a quarter-mile away will have poor quality stone.

In discussions with producers in Pennsylvania and New York, it seems that this variability is fairly consistent throughout the entire region. Thus it would not seem that a producer in any particular area has an inherent geological advantage. For example, quarrymen in New York can be expected to find approximately the same variability in quality deposits as a Pennsylvania producer would find. At present there is no way for the quarrymen to tell beforehand what grade of bluestone will be found in a particular deposit. He only discovers this as he quarries.

Prospecting for new quarry sites is accomplished by walking through the hills looking for what are referred to as "sliders" and tracing
these to the outcrop of bluestone. The best location of a quarry as far as start-up costs are concerned is a hill top because removal of overburden is then only a minor problem. The quarry operator usually cannot predict the life of a quarry. The primary tools used in the quarry are low-cost hand tools such as crow bars, wedges, and hammers. Air compressors and diamond saws are now being used to a great extent to remove stone from the quarry. The diamond saw probably represents the major piece of capital equipment, as far as the actual quarrying of the stone. Fork life tractors and trucks are used to remove the stone from the quarry. The quarried stone is placed on pallets, which usually hold approximately 100 square feet of stone per pallet. Pallets are used in significant quantities.

Most of the quarries are small, employing two or three people on the average. These are usually the operators of the quarry which are normally organized on a partnership basis. Since the quarries are so small and widely scattered there is little opportunity to use large capital equipment in these operations, such as is used in some limestone quarries. Because of the fact that a relatively small capital investment is required to start a quarry, entrance into the bluestone producing sector is easy, and the fact that there are so many small quarries seems to attest to this. During the period of research it was found that producers generally could sell all the stone they produced. The royalty for leased land ranges from 2¢ per square foot to 5¢ per square foot, depending on the type deposit, and work performed on it.
Distribution

This sector of the bluestone industry deals mainly in buying stone from the quarries in the area, performing various finishing operations on the stone or none at all, and selling to stone dealers located near urban markets or selling to contractors who come to the quarry area to buy stone. These stone yards located in the quarry regions are usually referred to as "docks." Their major advantage is that they are capable of filling large orders for bluestone, and have the equipment to perform various operations on the stone. The major piece of equipment for these dealers are wire saws, which are used to cut down slab stock. Because this piece of equipment requires a large capital outlay, the expense is justified only if the machine is fully utilized. This is the reason why the "docks" have such equipment which is not found at the quarry sites where it would only be used intermittently.

The "docks" also provide another service to the quarry sector by providing a ready market for the quarries' output. The usual transaction is cash on delivery of the stone to the dock, this, therefore, presents a steady flow of funds for the undercapitalized quarry operator. In some cases the "dock" operator will also perform services such as removing overburden from the stone deposit and constructing haulage roads for the quarry operator. The cost of this is deducted from the stone that is delivered to the yard.

Another type of distributor, who can be located in the quarry area, is the stone broker. This person, or agency as the case may be, usually performs no operations on the stone with regard to preparing it for market but functions mainly to supply stone where it is needed in the
market area. The broker will buy from various quarries in the area until he fills his order for the stone required and then delivers it. Since the broker has no stone yard or processing equipment, he is not confined to a particular area nor in some cases to this particular business.

The producing sector and distributing sector do not have to be distinct or separate functions. In some cases a quarry operator will also own a "dock." Also, sometimes the "dock" operation is bypassed completely by quarry operators who prefer to sell directly to contractors or market area stone dealers who come to the quarry area.

Marketing

This sector consists of stone dealers, who are located in or near the consuming markets. These dealers usually sell more than one type of dimension stone, and in a few cases sell only bluestone. Because bluestone quarrying is so removed from the major markets (which are New York City and Philadelphia), it is believed they play a vital role in establishing bluestone as building material with a good product image. The major emphasis of this report is based on this premise. The stone dealer in the market area provides a vital link between producing sector and the consuming sector, which consists of contractors, architects, and the "do-it-yourselfer."
CHAPTER IV.

MARKET AREA AND PRICING OF PENNSYLVANIA BLUESTONE

Market Areas for Pennsylvania Bluestone

One of the first questions the researchers addressed themselves to was the identification of the market for bluestone quarried in northeastern Pennsylvania. An obvious factor of importance is the low value to weight ratio of bluestone, which makes transportation a significant contributor to delivered costs and therefore sets a limit to the areas in which Pennsylvania bluestone is sold. Of course, in some cases, because stone may not make up a significant share of the total cost of a building, it may be brought in from long distances due to a preference of a particular architect or contractor. Another cost factor is the breakage of the bluestone. The farther the distance traveled the more likely it is that some of the stone will split meaning lost revenue for the quarry operator. Practically all Pennsylvania bluestone is transported from the quarry area to market by trucks. For privately owned vehicles the charge for transportation ranges from 6¢ to 10¢ per ton mile depending on thickness of the stone and distance traveled. One other factor that limits the extent of bluestone's market area is the existence of a substitute stone that is closer to the market than bluestone. The major advantage here is the lower cost of transportation and therefore better delivered price of competitive stone.

The major market area for Pennsylvania bluestone seems to be defined by the following area (see Figure 2): Harrisburg forms the western boundary; Wilmington, Delaware the southern boundary; Long Island the
FIGURE 2. Major and Minor Markets for Pennsylvania Bluestone.
eastern boundary; and Syracuse defines the northern boundary. Pennsylvania bluestone does move outside these areas, but mostly in small quantities. Figure 2 also indicates these peripheral markets. It should be noted that bluestone is also quarried in New York, and in some cases stone dealers did not distinguish between New York and Pennsylvania bluestone. Bluestone shipped from New York apparently moves farther west into the Chicago market area. Since some Pennsylvania bluestone is sold to nearby "docks" in New York, it is possible that some Pennsylvania stone also is marketed in Chicago. However, since no distinction is made by the New York dock operator as to the origin of the stone he ships, this hypothesis could not be checked.

Table 2 gives the distribution of stone dealers handling Pennsylvania bluestone in the major marketing area. Of course, a greater number of dealers in one area is not an absolute indicator that Pennsylvania bluestone is a major stone product, since many stone dealers are small in terms of sales volume. In addition, bluestone might make up only a major portion of their total stock of stone.

All large stone dealers in the market area sell stone on a retail basis and wholesale basis. For sales made wholesale the average discount is approximately ten per cent. Also in wholesale operations, the stone is usually delivered directly from the quarry to the job sites, which are mostly commercial projects. The major reason for this is that the size of the order will usually be large and also there is then only a minimum amount of handling the stone which decreases costs significantly. Local deliveries of stone (less than 25 miles) by the area dealers were undertaken as part of their customer services, for which there was no charge. The average distance of deliveries ranged from approximately
### TABLE 2.

**DISTRIBUTION OF STONE DEALERS HANDLING PENNSYLVANIA BLUESTONE**

<table>
<thead>
<tr>
<th>Major Market Area</th>
<th>Total Number of Stone Dealers</th>
<th>Number of Dealers Handling Pennsylvania Bluestone</th>
<th>Approximate Percentage Range of Total Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harrisburg</td>
<td>5</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>25</td>
<td>6</td>
<td>10 to 100</td>
</tr>
<tr>
<td>East-central Pennsylvania</td>
<td>14</td>
<td>6</td>
<td>20 to 75</td>
</tr>
<tr>
<td>Delaware</td>
<td>3</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Central New Jersey</td>
<td>5</td>
<td>3</td>
<td>20 to 40</td>
</tr>
<tr>
<td>Northern New Jersey</td>
<td>8</td>
<td>4</td>
<td>10 to 50</td>
</tr>
<tr>
<td>New York City-Long Island</td>
<td>6</td>
<td>3</td>
<td>5 to 30</td>
</tr>
<tr>
<td>Northern New York</td>
<td>10</td>
<td>6</td>
<td>25 to 100</td>
</tr>
</tbody>
</table>

Source: Interview data.

### TABLE 3.

**PRICE OF PENNSYLVANIA BLUESTONE**

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
<th>Quarry Area Average Price</th>
<th>Total Market Area Average Price</th>
<th>Average Percentage Total Market Area Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pattern</td>
<td>Composite: all sizes</td>
<td>$.33c/sq ft</td>
<td>$.60c/sq ft</td>
<td>81.8</td>
</tr>
<tr>
<td>Tread</td>
<td>Composite: all sizes</td>
<td>$.64c/sq ft</td>
<td>$1.54/sq ft</td>
<td>140.6</td>
</tr>
<tr>
<td>Veneer</td>
<td>Random</td>
<td>$25/ton^a</td>
<td>$47/ton</td>
<td>88.0</td>
</tr>
<tr>
<td>Coping</td>
<td>Composite: all sizes</td>
<td>$.77c/sq ft</td>
<td>$1.33/sq ft</td>
<td>72.7</td>
</tr>
<tr>
<td>Specials</td>
<td>Composite: all sizes</td>
<td>$1.35/sq ft</td>
<td>$5.00/sq ft</td>
<td>270.3</td>
</tr>
</tbody>
</table>

^1 ton = approximately 50 to 55 sq ft.
25 miles to 75 miles. Within this range charges are made for delivery which approximated ten per cent of the cost of the stone in some areas, beyond this range a flat freight rate is used.

The above has defined the major and minor market areas for Pennsylvania bluestone. In the major marketing area it is difficult to single out any particular section as being the dominant consumer of bluestone, mainly due to a lack of accurate data. Another factor which was mentioned above is that New York bluestone also moves into these markets and some stone dealers do not distinguish between them. In practically all sections of the marketing area except Delaware, which is a special case, and those areas adjacent to the quarry areas, New York bluestone has also entered the market, and in the larger areas such as Philadelphia and New York it has become a significant factor. Other dimension stones have also been substituted for Pennsylvania bluestone and in some cases have practically replaced it. The implications of this will be discussed later. Finally, it should be mentioned that some Pennsylvania bluestone is exported, but this is a very minor factor and was not considered in this study.

**Pricing of Pennsylvania Bluestone**

Prices can be broken down into two main categories: those prices set in the quarry area and those set in the various market areas. The basic unit upon which prices are quotes is the square foot, except for veneer or wallstone which is priced on a per ton basis due to the randomly sized pieces. The price of bluestone will vary depending on the type or use of the stone, the thickness, and the amount of preparation performed, such as rubbing, cutting, or polishing the stone. Table 3
gives a breakdown of prices for the various types of stone in the
quarry area and in the market place.

Because Pennsylvania bluestone presently is marketed as a homo-
geneous commodity and there can exist only one price in a particular
market, a producer who has a quarry consisting of good quality stone
will not be able to obtain a price higher than that obtained for poor
quality stone. In the quarry area, a limit on the price range will be
approximately set for all stone by quarrymen who sell poor quality
stone since that is what exists in his quarry. This is because there
has been little effort to differentiate the product of one producer
from the product of another. Therefore, a stone dealer presently
purchasing Pennsylvania bluestone will look on it as one type of
dimension stone and buy it at the going market price which is set by
the inferior stone. This will produce an incentive to quarry carelessly
even though the inherent quality of bluestone is high.

Average prices are used, and no breakdown of the market area is
given since there were too few dealers in each area selling Pennsylvania
bluestone to permit a finer analysis. The category for specials in
Table 3 is somewhat invalid, since this type of stone refers more to
different types of operations on the stone, which includes a multitude
of things depending on each particular job. The price quotations vary
greatly and any composite price would therefore not be an altogether
realistic indicator of this particular type of bluestone.

Probably the most significant aspect of Table 3 is the average
percentage differential, for this gives an indication as to what extent
prices must be set by the stone dealer in order to continue selling this
stone and yet get an adequate return on it. It is interesting to note
that those dealers who charged the highest prices for bluestone in a particular area were usually the largest marketers of bluestone. The major reason for this stems from the fact that labor contributes a significant amount to costs, which are of course reflected in the price. The large stone dealers will usually go through each truckload of stone to grade the stone, separating poor quality stone from that of better quality. When the stone is sold, it will usually be handpicked, and other operations may be performed on it, thus the price will usually be much higher but the stone is of a higher quality.

The very high differential on tread reflects these labor costs. Since this type of stone will be used on stairways, it must be cut to the proper size and must be of high quality. Another factor reflecting market conditions is that treads are in relatively tight supply but the demand for them is quite steady indicating higher prices due to these conditions. Veneer, although not in great demand, also has a relatively high differential. It is believed that labor costs are again a major factor. Since veneer is usually sold in randomly sized lots, it must be sorted and checked as it comes off the pallets, this will affect costs significantly. Coping, which is used for the top of masonry walls, is in some cases considered as a type of tread, but according to how it is prepared for use, it is in some cases priced lower than tread. This fact is reflected in its differential which is 72.7 per cent as compared to tread which is 140.6 per cent.

Prices in general were based primarily on a combination of the following factors: labor costs, areaa coverage of stone, other in-yard costs, inbound transportation and delivery, and in a very few cases services. These services would consist of such things as technical
assistance, drafting and installation of the stone. Where a stone
dealer installs the stone, the work is usually subcontracted out. It
should be mentioned that the larger stone dealers use a grading system
for their stone. Good quality, or "Number 1" stone is priced on the
average between .15c to .20c above the poorer quality "Number 2"
stone. In all cases, there were only two grades. Stone dealers
judge the quality of bluestone by the smoothness of the surface,
reediness, and accurateness of size specifications.
CHAPTER V.

MARKET ANALYSIS OF PENNSYLVANIA BLUESTONE

Introduction

The analysis presented in this section is based on two sources. The first is the stone dealers in the market areas, who also provided the information in the previous sections. The second is the architects in the major marketing area and also in some of the peripheral areas.

It was believed that the stone dealers would be a major source of information in understanding the structure of the dimension stone market and how Pennsylvania bluestone shares in this market. The stone dealer is the link between the quarry area and the consumer of the stone. He must respond to the trends developing in the market area if he is to remain a viable factor in the stone business. These responses also reflect back on the quarry area in the form of either a growing or declining share of that particular market. For dimension stone these trends are established over a long period, because of the very nature of the product. Since dimension stone is a naturally occurring building material its reputation is built up over years of use, during which time inferior dimension stone is exposed and replaced in the market by some other stone or substitute material. One of the major factors that has hindered the growth of dimension stone use in the past was the above mentioned fact, that because stone is natural, not much more could be done to it. Only in recent years have innovative techniques come into play making dimension stone more competitive with manufactured building materials. It was necessary to define these trends for Pennsylvania bluestone.
The stone dealer comes in contact with three major types of buyers: the individual home owner or "do-it-yourselfer" as he is usually referred to, the building contractor, and the architect. Information on the first two, it was believed, could be obtained from the stone dealers. Consequently, a survey of the stone dealers was conducted primarily by personal interview, and those that could not be contacted personally were sent questionnaires of a general nature (see Appendix). The third type of buyer, or more accurately, user of dimension stone, the architect is a special case, since members of this group ordinarily do not come into direct contact with stone dealers but will have an overriding effect in setting trends in the use of building materials. Because of this fact, a separate survey was conducted of 500 architects in both major and minor marketing areas of Pennsylvania bluestone. The minor areas were considered since they might develop into larger ones depending on architects' knowledge of the stone (see Appendix for sample questionnaire).

**Survey of Stone Dealers in the Market Area**

The survey of stone dealers consisted of personal interviews, questionnaires and, in a few cases, telephone calls. As many as possible were contacted personally, since more explicit information could be obtained only in this way. It was desired to take a 100 percent sample of stone dealers selling Pennsylvania bluestone in its major marketing area, and furthermore to contact these dealers personally. Outside this area, a random sample was taken of stone dealers found in the "Yellow Pages" of the telephone directory of larger cities lying
in the minor market area. These were contacted by telephone. A total of 42 stone dealers were surveyed, with the distribution in each state as follows:

<table>
<thead>
<tr>
<th>Major Marketing Area Pennsylvania Bluestone</th>
<th>Total Surveyed</th>
<th>Number Selling Bluestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pennsylvania</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>New Jersey</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>New York</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Delaware</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor Marketing Area Pennsylvania Bluestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhode Island</td>
</tr>
<tr>
<td>Massachusetts</td>
</tr>
<tr>
<td>Maryland</td>
</tr>
<tr>
<td>Connecticut</td>
</tr>
</tbody>
</table>

The size of these dealers could not in all cases be obtained, so any ranking based on sales, or on tonnage of stone handled, would not give an accurate description of the sample, and is omitted. Relative to others in a particular area, a stone dealer will usually know whether his is the largest operation, and this was the most common indication of size given during the survey. Size is of some importance, since the largest stone dealers will usually have been in a market for a long period of time and have developed a reputation of handling good quality stone. This fact is probably one of the major marketing tools of the stone dealer, for contractors will usually rely on the reputation of the stone dealer more than any other factor, except price, if he is looking for good quality stone and does not know much about it. Another factor concerning the size of the dealer is that the large ones will be able to handle large commercial projects since they are sufficiently
capitalized and do not require immediate payment, whereas the smaller stone dealers usually sell on a "cash and carry" basis.

In surveying the various dealers in the major market area, it was necessary to find out from which sources they preferred to purchase bluestone. The various sources consisted of the quarries themselves; "docks" in the quarry area, brokers, and possibly a combination of these. The reasons for buying from these sources were also considered important, since any reorganization of the quarry area could possibly affect the stone dealer's buying patterns. Of the stone dealers surveyed in the major marketing area, 11 preferred to buy directly from the quarries. Another ten purchased bluestone from "docks" and three preferred buying from brokers. The ten dealers buying from "docks" were the largest size dealers in their particular section of the market as far as sales of bluestone were concerned. The remaining four consisted of two of average size and two of small size relative to others in their area. The 11 dealers purchasing stone from various quarries consisted of one dealer who was large relative to others, eight of average size, and two small dealers. The three dealers buying from brokers were all estimated to be of average size relative to other stone dealers in their market areas.

The reasons for buying from a particular source seemed to fall into two categories: price and quality. Some dealers preferred to obtain bluestone at the lowest price possible and, therefore, felt that the "docks" served to keep prices high. Those purchasing stone from various quarries believed lower prices could be obtained. In some cases this fact showed in the quality of the bluestone, which the stone dealers do not neglect to point out. However, there is an additional
contributing factor to this type of purchasing decision, and this appears to be the type of market served. It was found that where bluestone is a small portion of total stocks of stone (25 per cent or less) and the majority of consumers are home owners in the area, the stone dealer is more price conscious than quality conscious. The main reason lies in the fact that his customers are looking for low prices, since they usually buy bluestone for garden walks or a similar type of use and are not directly concerned about quality. As pointed out above, most stone dealers of average size and smaller buy directly from the quarry. This seems to indicate a desire to buy at the lowest prices, however, another consideration was found which made analysis inconclusive. This is what usually a dealer will buy from only one quarry, since he is familiar with the person operating it and the quality of the stone coming out of that quarry. Thus he is assured of a dependable source of supply. It should be noted here that all stone dealers relied on their source of supply to ship good quality stone, which indicates that a lot of weight is placed on the reputation of a quarry operator or "dock." This acts as a type of quality control for the stone dealer, saving him the time of going through each pallet of stone when it is delivered.

The majority of stone dealers buying from "docks" are large stone dealers whose customers consist of mostly general contractors. They, therefore, need an assured supply of bluestone sufficient to fill large orders. The bluestone must also be of good quality, since it is used in commercial type buildings. The "docks" satisfy these requirements being able to assemble large orders from several sources and also will cut stone to desired specifications for the stone dealer permitting
wholesale shipments if necessary. The large stone dealers are more quality conscious than price conscious due to the type of market they serve. There were also firms of average and small size buying from the "docks." The docks will usually have various grades of bluestone based on its quality and priced accordingly. They also carry types of bluestone which may be harder to locate from various individual quarries such as large treads or slab stocks. Thus these stone dealers find it advantageous to purchase their stone from the "docks," because of these factors. The average-size stone dealer will usually sell to contractors who construct residential housing, and also to home owners. He, therefore, needs to carry a variety of bluestone to meet these demands both on a quality and price basis.

A minority of stone dealers obtained stone through brokers. All three dealers are well established in their marketing area, and are of average size. Since he has a knowledge of the quarry area, the broker knows where he can obtain the bluestone desired by the stone dealer. He is, therefore, more flexible than the "docks" or individual quarries, and since he in actuality serves as a purchasing agent for the stone dealer, his prices will fall between those at the quarry and those at the docks. Of course, the broker does not provide any services for the stone dealer, and in some cases procured poor quality stone. One significant factor that was found in considering the purchase of bluestone, is that once a reputable source of supply is established a stone dealer will usually remain with that supplier. Thus, it was found that all large stone dealers and most of the average size ones all purchase bluestone from one supplier, one that they had dealt with over a number of years.
Looking at the other end of the spectrum, or the stone dealers' customers, it was desired to find out what type of bluestone was most demanded. All stone dealers selling bluestone indicated that pattern was the type of bluestone sold most frequently, in the 1" to 1-1/2" size range. Second in demand in all cases were treads for stairways. To some extent there is a derived demand for treads, since where a pattern is used, treads will usually be installed also. It was also shown in all cases that the majority of bluestone is used for exterior purposes with significantly smaller portions being used for interior design. Of all types of bluestone, veneer was in the majority of cases indicated to be in smallest demand, the reason being that there are more substitutes available for this particular type of bluestone, which are more popular for this purpose.

In surveying the various stone dealers, it was found that a distinction is made between New York bluestone and Pennsylvania bluestone, one that is very critical. Although the bluestone is from the same geological horizon, the general consensus among stone dealers is that there is a difference.

In general these stone dealers carrying inventories of bluestone could be grouped into three classes. Those stocking only Pennsylvania bluestone, those stocking only New York bluestone, and those stocking both. Of all dealers handling bluestone who were surveyed, nine sold only Pennsylvania bluestone, ten sold only New York bluestone, and 15 sold both New York and Pennsylvania bluestone. Five of the nine selling only Pennsylvania bluestone were located in Pennsylvania (two were in New York, one was in New Jersey, and one in Delaware). Of those dealers selling only New York bluestone, only one was located in
Pennsylvania; of the rest two were located in New York, two in New Jersey, one in Maryland, and four in New England. The dealer located in Pennsylvania, however, is actually a salesman for a large New York stone dealer located in the quarry area. The 15 that sold both types were made up of three Pennsylvania, three New England, five New York, one Maryland, and three New Jersey firms. Three of the stone dealers also operated their own bluestone quarries, in addition to buying some bluestone from other sources. These three were also considered to be large in their respective market areas which are New Jersey, Pennsylvania, and Maryland.

One very significant fact is that of those dealers selling both types of bluestone, Pennsylvania bluestone usually makes up a small portion of the total bluestone stocks. This will range from 10 per cent to 20 per cent. This share has gradually decreased over the years due, it was stated, to the variable quality of Pennsylvania bluestone that is being shipped out of the quarry area. A typical appraisal which was voiced throughout the survey, was made by one of the New York stone dealers who buys Pennsylvania bluestone only. He reported that the trend seems to be carelessness in cutting stone, and trying to pass onto dealers more bad stone, than good quality stone. This is the marketing image Pennsylvania bluestone has at present. It seems that most Pennsylvania bluestone is shipped for use in the residential housing market, especially where price considerations outweigh those of quality. Thus, stone dealers will sell Pennsylvania bluestone to the private contractor and "do-it-yourselfer," and will not market the stone for the commercial type of projects. It could be said that Pennsylvania bluestone shares only in the marginal markets for bluestone
in general. Where a stone dealer has a major share in a market he
often will not actively market Pennsylvania bluestone.

Considering the distribution of dealers by states, it was found
that a majority of the stone dealers were dissatisfied with the quality
of Pennsylvania bluestone they had been receiving. In Pennsylvania
eight out of nine dealers surveyed criticized Pennsylvania bluestone.
Five out of the seven in New York were dissatisfied with Pennsylvania
bluestone. All four stone dealers who sell Pennsylvania bluestone in
New Jersey made criticism about the stone. In the Maryland market the
opinion is shared. Delaware was a special case in that the dealer
there is a brother of a quarry operator in Pennsylvania.

The New England area surveyed, consisting of Connecticut,
Massachusetts, and Rhode Island seemed to be an exception. Although
no actual figures were obtained, it can be stated that this area pro-
vides a large market for bluestone. All dealers indicated that blue-
stone was one of the most demanded dimension stones in the area and of
the three selling Pennsylvania bluestone, only one dealer located in
Connecticut was dissatisfied with the stone. The other two dealers
were satisfied, although it was not ascertained how much of their total
bluestone stocks Pennsylvania bluestone made up. It was indicated that
a lot more Pennsylvania bluestone moved into the New England area in
the past than at present.

What can be attributed to the poor marketing image that Pennsylvania
bluestone has acquired? In a general sense the answer lies in the almost
nonexistent communication between the quarry area and the stone dealers
who sell the stone. The problem seems to stem from the quarries. Here
the major emphasis seems to be placed on just getting the stone out of
the quarry and sold. The quarry operators do not seem to be responsive to existing market conditions.

In the southeastern Pennsylvania area, of which Philadelphia forms a major market, the general consensus of stone dealers was that Pennsylvania bluestone producers had closed themselves out of the market in almost all types of construction except residential housing projects where quality was considered of secondary importance. Farther south in the Baltimore-Washington, D.C. market area it was found that stone dealers had actually stopped promoting Pennsylvania bluestone for any commercial work, since its variable quality resulted in dissatisfied customers. In New Jersey stone dealers echo the same opinion, and have been selling substitutes for Pennsylvania bluestone. The most logical alternative is New York bluestone, but Ohio sandstone is also being substituted as it is in the Pennsylvania market areas. Although Ohio sandstone is considered by many stone dealers to be inferior to bluestone because it is not as durable where it is subject to abrasive wear such as in a tread. It has been capturing the low price markets that Pennsylvania bluestone now holds, because it can be obtained cut to constant size.

The stone dealers have claimed they pointed these "facts of life" out to the quarry operators, but in general the same type of stone keeps coming from the quarry area. It was also stated that in some cases the price of Pennsylvania bluestone at the quarry fluctuated widely and that the individual quarries were an undependable source of supply. This was usually brought out by those stone dealers who were in the majority of cases small relative to others in the area but also by a few average size dealers.
One of the major problems with Pennsylvania bluestone seems
definitely to be that of quality control. This ranges from stone
which is of inherently poor quality due to reediness and rough surfaces
to stone which is not cut properly. The majority of the criticisms
seemed to be in regard to the latter property, although the former was
often mentioned in conjunction with it. Reediness, which causes the
stone to split apart after it is laid due to weather action, is a
problem of the stone deposit itself and not much can be done about it
except not to ship this type of bluestone to market. Yet in going
through a stone dealer's stock, one of the indications of Pennsylvania
bluestone is this reedy characteristic.

Stone dealers are very dismayed by reedy stone and wonder why it
is frequently shipped, usually hidden in among the other bluestone on
the pallet. The explanation may be that the quarry operator usually is
greatly undercapitalized and sells stone only for immediate payment.
When he opens up a quarry it is almost a complete unknown as to what
type of bluestone will be found. But no matter what is found, he has
sunk a considerable investment (relative to his total assets) into it
and therefore will quarry as much stone as possible, even if of poor
quality, to recoup the original investment.

Another factor, which is of more importance now than in the past,
is the probability of finding a good deposit. There is much more risk
involved now since most of the easily found large deposits have already
been exploited and the ordinary method of discovering a deposit, which
requires only good eyesight to spot the outcrops, may have outlived its
usefulness. Thus, the quarry operator will tend to look at quarrying
as a means of getting as much a return from the quarry in the short
run and neglect any long run effects his stone might have on the market, since he is only one out of a 100 other operators in the area. When you have 200 people acting under this same rationale the effects will naturally be negative. This, of course, is only an explanation of why there is such a lack of response to quality complaints in the quarry area, and is not a justification for the shipping of poor stone.

The major criticism regarding poorly cut stone, which is typified by improper size specifications, broken corners or edges, and out of square pieces, is a production problem and one that could be corrected easily. This is a definite hinderance in the application of Pennsylvania bluestone for commercial projects, since specifications set by the architect must be met within a good degree of accuracy and any errors reflect on the stone dealer in the market. Thus Pennsylvania bluestone is losing a large market due to the fact it is not cut properly. Some stone dealers feel the diamond saws are not used properly, but this overlooks the real problem which is a lack of skilled labor. It is often stated that the diamond saws should be used to remove only large pieces of slab stock from the quarry then the smaller pieces should be hand snapped; or if diamond sawed, checked for squareness and then cut.

Another common criticism is that diamond sawed edges conceal reeding if it exists in a piece of bluestone and therefore permits poor quality stone to be sold. The natural edge produced by handsnapping the bluestone is not attained by diamond sawing which instead produces a very smooth non-textured edge. An additional complaint
against the smooth edge made by many stone dealers is that they prefer hand snapped edges which represent a traditional characteristic that is desired in dimension stone.

There is a definite need for quality control in the quarry area. Average size and large dealers indicated that a higher price would not affect their decision to buy a dimension stone if it was of good quality. This is readily indicated by some New York bluestone which is marketed under the trade name of "Elk Brook Bluestone," by a large supplier in the quarry area. It is regarded by the majority of stone dealers as of the highest quality. It sells for 100 per cent above comparable types of Pennsylvania bluestone in the quarry area, and yet has one of the largest marketing areas for bluestone. The reason for the high price is, of course, the rigid quality control standards set by the dealer but this had in effect increased its marketability.

Members of the Pennsylvania bluestone quarry industry must take a long hard look at their business and realize that in marketing dimension stone credibility about one's product carries a lot of weight through all segments of the industry when choice of suppliers is made. By quarrying bluestone for short-run gains, improvement in sales of the Pennsylvania bluestone industry will be more difficult in the long-run.

All stone dealers surveyed were asked first whether they thought the demand for dimension stone in general would increase, and secondly whether the demand for bluestone (New York and Pennsylvania) would increase. The results are presented in Table 4. For dimension stone in general the majority of dealers foresaw an increase in demand over the next two to three years, and practically all felt their markets
would not decline. The same could be said for those dealers also selling bluestone. The interesting fact in Table 4 is that all those dealers who foresaw a decrease in demand for bluestone over the next two to three years were of small to average size in their area and handled mostly Pennsylvania bluestone.

Finally, it was desired to obtain some idea of the knowledge of buyers concerning dimension stone. The majority of dealers agreed that the homeowner had a very poor knowledge of dimension stone and so did a majority of private contractors. It was indicated that they usually relied on the dealer to sell them quality stone if this was their primary consideration. General contractors and architects were considered knowledgeable but in a number of cases it was indicated that they often confuse different types of stone, and are more aware of physical properties desired for a certain stone. Most stone dealers, however, do not deal directly with the architect.

<table>
<thead>
<tr>
<th>TABLE 4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUTURE DEMAND FOR DIMENSION STONE AND BLUESTONE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Increase</th>
<th>Constant</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pennsylvania</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension Stone</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
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<td>Bluestone</td>
<td>3</td>
<td>5</td>
<td></td>
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<tr>
<td>New York</td>
<td></td>
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<tr>
<td>Dimension Stone</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Bluestone</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>New Jersey</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dimension Stone</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Bluestone</td>
<td>1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Delaware and Maryland</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dimension Stone</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bluestone</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>New England</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension Stone</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Bluestone</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
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<td>Dimension Stone</td>
<td>25</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Bluestone</td>
<td>11</td>
<td>19</td>
<td>7</td>
</tr>
</tbody>
</table>
CHAPTER VI.

SURVEY OF ARCHITECTS IN MAJOR AND MINOR MARKETING AREAS

Introduction

A survey, consisting of questionnaires, was conducted of 500 architects in 17 cities in the major and minor marketing areas for Pennsylvania bluestone. The areas sampled are listed in Table 5.

The major portion of the survey (315 architects) was centered on the major market area. The primary purpose of the survey was two fold. First it was desired to learn whether dimension stone in general is being widely applied by the architectural community, and second whether they were aware of bluestone as a dimension stone. No distinction was made between Pennsylvania or New York bluestone since it was felt that only general trends were to be established. The architect, of course, plays a major role in the construction industry for employing different construction designs, and developing new uses for old and new building materials. He, therefore, is important in establishing new user trends. Thus the questionnaire also probed into the decision-making process of the architect criteria for the selection of dimension stone, and also factors affecting the architects' demand for dimension stone.

The sample was taken from the "Yellow Pages" of selected telephone directories. The selection procedure was based on taking every fifth, seventh, or tenth name depending on the size of the particular city. The names were then checked to make certain that an architect of a large

\footnote{See Appendix.}
TABLE 5.
SURVEY OF ARCHITECTS

<table>
<thead>
<tr>
<th>State</th>
<th>City</th>
<th>Total Number Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pennsylvania</td>
<td>Philadelphia and Vicinity(^a)</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Harrisburg</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Scranton-Wilkes Barre</td>
<td>14</td>
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<tr>
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</tr>
<tr>
<td>Rhode Island</td>
<td>Providence</td>
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</table>

\(^a\)Includes Doylestown, Norristown, Conshohocken, and Lancaster.

The firm was not double counted as a single architect. The questionnaire was tested in the State College area first, to see if any ambiguities existed in it, fortunately none did. The survey was conducted on a non-repetitive basis, due to the usual constraints of time and money. One omission, found after the questionnaires were sent out, was that no provision was made for determining in what city the architect worked.
This prevented breaking down the results of the survey on a city by city basis and also prevented us from knowing what areas did not respond well to the questionnaire, although it did not affect the sampling method. Out of the 500 questionnaires sent out, 192 were answered, 14 of which were returned because of wrong addresses – this gives a response of 38.4 per cent with the returned questionnaires included, and 35.6 per cent without them.

**Analysis of Survey**

The results were classified according to the type of architect. These consisted of residential, commercial, industrial, public, institutional, general architects who were small in size, and general architect offices which were large in size. The basis for determining the type or architect depended on the response to the first question. The results are analyzed on an aggregated basis since the trend seems to be carried through for each particular class of architects. However the results for each class of architects are presented in the Appendix and can be examined further.

Of the 178 architects who responded to the questionnaire, 73 per cent have specified dimension stone at some time for their projects. Looking at bluestone specifically, 72 per cent of all architects responding stated that they had specified bluestone for their projects. The extent to which bluestone is used by this 72 per cent is as follows: 31 per cent used bluestone often, while 67 per cent used it only sometimes. The majority of the bluestone used is for pattern both indoor and outdoor, with tread coming in second. The third most popular
application was of "other uses," although it is a large margin behind the first two.

For dimension stone in general, the degree of usage ran as follows: 33 per cent of the architects indicated that they used dimension stone often, while 64 per cent used in only sometimes. The majority of dimension stone is used as pattern, with treads being second and veneer third. Preassembled wall panels of dimension stone were not utilized extensively by the architects.

These results seem to indicate that architects in the marketing area surveyed are just as interested in using bluestone as they are in using other types of dimension stone. This could stem from the fact that bluestone is more readily available and closer to the overall market that are producers of other types of dimension stone. This means lower transportation costs to the market area. The survey also attempted to uncover what criteria an architect employs in deciding which to use among the various types of dimension stone available. Eighty-five per cent of the respondents indicated that the color of the stone was the most frequent criterion used for choice among various dimension stones. Texture of the stone also ranked as an important consideration getting 80 per cent of the responses. Durability was chosen 76 per cent of the time while cost relative to other dimension stones was considered relevant by 53 per cent of the architects. Technical specifications, reputation of the stone dealer, and recommendation of the stone mason were not considered as relevant and received notice in less than 15 per cent of the responses. Making a finer distinction as to primary and secondary criteria, the relative positions of the criteria do not change but remain in the same position as above.
The survey results seem to indicate that where an architect is committed to using stone for a particular project, cost considerations are of minor importance. The architect will be more concerned with the appearance of the stone. The relatively minor importance of technical specifications would indicate that architects use stone where it serves more of a decorative than functional purpose, not being an integral part of the building's structure. It was also asked whether the architects would use the same criterion for bluestone. The majority (over 90 per cent) indicated that they would.

Dimension stone's ability to compete with other materials in the next few years was another question asked of architects. Of the respondents, 69 per cent indicated that the architects' preferences would play a role in deciding whether dimension stone would be used. Base cost and installed cost would be another factor in deciding among different building materials, these being chosen 67 and 65 per cent of the time respectively. The architects did not seem to consider public preference a prime factor choosing it only 49 per cent of the time.

If questionnaire responses are broken down into primary and secondary factors, costs, both "base" and "installed," were indicated to be of primary importance by the majority of architects. Although the architect's preference is also considered of primary importance, it now ranked second to costs. Availability of stone (or in other words an adequate supply) is considered to be more of a secondary factor by architects. From the above it could be said that there should be a constant awareness in the dimension stone industry to develop or take advantage of new techniques both in quarrying and installation in order
to keep costs competitive with other materials. Also, however, the
dimension stone industry should be aware of what the architectural
community is thinking, and show them what they are doing in the appli-
cation of dimension stone for various uses. This, of course, is most
important to bluestone producers since they are only a small segment
of the dimension stone industry.

In considering how architects become aware of bluestone, no one
method showed a large response. Of the architects, 38 per cent indi-
cated that experience over the years had made them aware of bluestone,
while 23 per cent had heard of it through other architects, and 21 per
cent through trade journals. Thus this would seem to indicate that
bluestone has not been promoted to any great extent, most of the aware-
ness concerning the stone being built up over the years through its
mere existence as a type of dimension stone.

Finally, the demand for dimension stone and bluestone in the near
future were looked at. The general consensus was uncertain. Out of
the 178 who responded, 49 per cent did not answer the question about
dimension stone, and 51 per cent did not answer about bluestone demand.
Of those that did answer, 38 per cent did not know what the demand would
be like for dimension stone, and considering only those architects that
actually used bluestone 40 per cent of these indicated they did not know
what would happen. Another 25 per cent indicated they thought demand
would remain constant for dimension stone, while 34 per cent thought
bluestone demand would remain constant. One interesting fact was that
three per cent more architects foresaw an increase in the demand for
bluestone, than they did for dimension stone. Of course, these
architects were only 17 per cent of all those who used bluestone and responded to the question, a definite minority.

It is difficult to infer anything from the above other than that possibly with so many substitute materials available, architects are undecided as to which one to use. This would indicate the need to promote dimension stone and bluestone more.
CHAPTER VII.

SUMMARY

This report has studied the present structure of the bluestone industry and the market existing for Pennsylvania bluestone. The analysis was based on information gathered through personal interviews, and the results of a questionnaire sent to 500 architects. One of the major purposes of the study was to see whether there was a possibility of increasing the marketability of Pennsylvania bluestone, based on its present position in the dimension stone market.

Improved marketing might provide the chance to bring additional income into the quarry area, which could perhaps benefit the region as a whole. It would seem more advantageous to help develop the quarry industry than shift the labor force into other industries. Quarrying is indigenous to the region and employs people who reside in this area, which is considered economically depressed. Improved stone sales would create benefits which would accrue directly to the residents. Such a result contrasts to the alternative of bringing in another type of industry from outside the region, where much of the additional benefits might accrue to nonresidents.

Through the information received from stone dealers it was found that Pennsylvania bluestone does not have a good marketing image and furthermore that stone producers in this area are generally considered irresponsible in regard to product quality. Pennsylvania bluestone is sold as inferior quality stone by many dealers, and generally moves into the residential housing market. Most stone dealers will not promote
Pennsylvania bluestone for commercial type projects for fear of damaging their reputation as a quality stone dealer.

The major problems with the Pennsylvania bluestone that is shipped from the quarries are: (1) the large quantities of reedy bluestone that are entering the market, and (2) improperly cut stone. The latter problem is the most frequently cited in terms of our surveys.

Other criticisms of Pennsylvania bluestone indicated that its price fluctuated so much that the stone dealers could not set a stable price and that commitments to supply stone to a particular dealer were ignored. Such complaints, however, were most often cited by smaller stone dealers. All of these problems, however, should be looked upon as significant factors in affecting the marketability of Pennsylvania bluestone.

Although most quarry operators indicate that they can sell all they produce, the quality of the stone is not taken into account. Therefore, operators tend to consider only the short-run and neglect the long-run effects on a particular market, usually with the implication that there will be other markets open to them. The problem is that Pennsylvania bluestone is gradually being closed out of many markets because of the above factors that have an adverse effect on its reputation.

In a number of areas where Pennsylvania bluestone was sold in large quantities, it has now been replaced by New York bluestone or some other suitable substitute. It appears that unless certain steps are taken, the cumulative long-run effect of the problems mentioned in this analysis will be an overall decline in the acceptance of Pennsylvania bluestone by stone dealers.

The architectural community surveyed seemed to be aware that bluestone was available although no distinction was made between New York
and Pennsylvania explicitly in the questionnaire. When committed to using a stone for their projects the majority of architect respondents base their decisions upon color, durability, and texture, not using technical specifications to any great extent. When deciding among different materials, cost is a significant factor, as is the architects' preference for a particular material. With regard to bluestone it seems that more communication is needed with the architect to make him aware of what can be done with it. One indication of this is that out of the 178 architects, 77 requested information on bluestone which would give technical data, comparative costs, availability of stone from various dealers, installation procedures and costs, and illustrations of use.

It is apparent from the present study that further research should be performed, which was not appropriate in the initial study. A more quantitative development of the demand for Pennsylvania bluestone, should be carried out, which would provide a basis for determining the elasticity of total revenue when prices are increased. Demand elasticity can be defined simply as the relative responsiveness of a quantity demanded to a change in price. It will depend on such factors as availability of substitute materials, the cost of the commodity relative to the total budget available, and consumer preference (taste). At present all that can be said about the elasticity of demand for Pennsylvania bluestone is of an indeterminate nature. This is due primarily to a lack of empirical evidence that could be used to support any assumptions about it. It is believed that the determination of the demand elasticity would be of assistance to the producers in planning their production rates.
Another possible item for future research would be a detailed study of the planning and transportation activities of bluestone producers. This would involve surveying the quarry sector, and analyzing the data for efficient management techniques. From this, proposals could be made to help initiate sound management practices.

From what has been stated above then, it can be said that markets for bluestone in general, do exist and are in some cases expanding, but Pennsylvania bluestone's share is a declining one in many of these areas. It is indicated that perhaps certain steps should be taken in the quarry area to prevent this decline if the benefits of these steps are greater than the costs to initiate them. One of the major steps has already been taken by the formation of the Pennsylvania Bluestone Association, which is a co-sponsor of the project of which this report is a part. Some tentative proposals can be made as a result of this research that should be considered by the Pennsylvania Bluestone Association. These proposals are contained in a separate analysis "Future Strategies for Pennsylvania Bluestone Industry."
## APPENDIX 1

### LIST OF STONE DEALERS SURVEYED*

<table>
<thead>
<tr>
<th>Pennsylvania</th>
<th>Pennsylvania</th>
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<tbody>
<tr>
<td>John H. Roberts, Inc.</td>
<td>K. K. Kratzer Stone Company</td>
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<tr>
<td>129 Township Line Road</td>
<td>Allentown, Pennsylvania 18100</td>
</tr>
<tr>
<td>Fox Chase Post Office</td>
<td>(215) 797-0655</td>
</tr>
<tr>
<td>Philadelphia, Penna. 19111</td>
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<tr>
<td>(215) ES9-8553</td>
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<tr>
<td>Robinson Flagstones</td>
<td>Harpel's Flagstone</td>
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<td>Fort Washington, Penna. 19034</td>
<td>(215) 678-7283</td>
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<tr>
<td>(215) MI6-3500</td>
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<tr>
<td>Vickery Stone Company</td>
<td>Earl J. Malsnee</td>
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<tr>
<td>6328 Market Street</td>
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<tr>
<td>Upper Darby, Pennsylvania 19082</td>
<td>(215) 372-3211</td>
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<td>(215) GR6-0750</td>
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<td>Montgomeryville, Penna. 18936</td>
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<td>(215) 855-5363</td>
<td>(717) 599-5702</td>
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<td>Mankato Stone</td>
<td>Budding, J. C. Company</td>
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<td>250 East Church Street</td>
<td>Harrisburg, Penna. 17101</td>
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<tr>
<td>Elkins Park, Pennsylvania</td>
<td>(717) 238-7261</td>
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<td>(215) NE5-3100</td>
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<tr>
<td>Firestone Products, Inc.</td>
<td>Caretti, Inc.</td>
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<tr>
<td>300 Willow Grove Avenue</td>
<td>Harrisburg, Pennsylvania 17101</td>
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<tr>
<td>Glenside, Pennsylvania 19038</td>
<td>(717) 737-6759</td>
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<tr>
<td>(215) TU4-1387</td>
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<td>Edgemont Stone &amp; Supply Company</td>
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<td>W. Chester Pike &amp; Providence Road</td>
<td>Berwyn, Pennsylvania 19312</td>
</tr>
<tr>
<td>Edgemont, Pennsylvania 19028</td>
<td>NI4-9231</td>
</tr>
<tr>
<td>(215) EL6-6562</td>
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<td>Lima Quarry Patio &amp; Fireplace Center</td>
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<tr>
<td>Lima, Pennsylvania 19060</td>
<td>Valley Forge, Penna. 19481</td>
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<tr>
<td>(215) L06-2512</td>
<td>(215) 273-3713</td>
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<tr>
<td>Henry Glass Building Supplies</td>
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<tr>
<td>Bethlehem, Pennsylvania 18015</td>
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<td>(215) 865-5034</td>
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Pennsylvania, Scranton-Wilkes-Barre Area

Butler Supply Company  
700 N. Appl. Drive  
Scranton, Penna. 18512  
(717) 343-6661

Hugglers Penna. Bluestone  
137 South Main Street  
Taylor, Pennsylvania  
(717) 562-0344

Laurel Mt. Stone Corporation  
Newton Road  
Scranton, Penna. 18504  
(717) 347-9332

Walczak Lumber Company  
Clifford, Penna. 18413  
(717) 222-3651

Tomasetti, Julius & Son  
271 North Penna. Avenue  
Wilkes-Barre, Penna. 18701  
(71) 822-2625

Sans Souci Parkway Stone  
Sans Souci Highway  
Nanticoke, Penna. 18634  
(717) 735-1541

Lynch, John M.  
207 Paislig  
Pittston, Penna. 18640  
(717) 659-0909

Ronall & Son  
681 Main Street  
Edwardsville, Penna.  
(717) 287-5540

New Jersey-Passaic County - (near N.Y. border)

Frere Stone Company  
40 Franklin Turnpike  
Waldwick, New Jersey 07463

New Jersey (North)

Del Stone Company  
Cranford, New Jersey 07016  
(201) 276-6800

M & N Boychuck Stone Company  
Springfield, New Jersey 07081  
(201) 376-1333

John J. Curley Stone Company  
North Caldwell, Penna. 07006  
(201) 226-1851

Samson Stone Company  
Jersey City, New Jersey  
(201) 656-2417

Bergan Bluestone  
Paramus, New Jersey 07652  
(201) 261-1903

New Jersey Area

Trenton Stone Co. (formerly Peter DeFlasco)  
Trenton, New Jersey 08601  
(609) 882-2449

Garden State Stone & Supply  
Cherry Hill, New Jersey 08034  
(609) 662-4464

Corbin Steel & Stone  
Hightstown, New Jersey 08520  
(609) 448-2749
Delaware Area

Morrison's Pennsylvania Bluestone
Wilmington, Delaware 19800
(302) 656-2149

New York - Schenectady Directory

Adam Ross Cut Stone Co., Inc.
1003 Broadway
Albany, New York 12204
(518) 463-6674

Grandview Block & Supply Co., Inc.
1705 Hamburg
Hamburg, New York 14075
34-1909

New York

Domestic Marble & Stone Corporation
41 East 42nd Street
New York, New York 10017
(212) YU6-0320

Empire State Marble Corporation
207 E. 110th Street
New York, New York 10029
(212) LE4-2307

Johnson & Rhodes
East Branch, New York 13756
(607) 363-2282

Washington, D. C. Area

Tri-State Stone Company
8200 Seven Lock Road
Bethesda, Maryland 20014
(301) 652-7728

Lanham Construction Company
5634 Whitefield Chapel Road
Lanham, Maryland 20801
(301) 577-2163

Patapsco Natural Stone Quarries
Marriottsville, Maryland
(301) 328-2460

B & P Stone & Marble Supply
177 Liberty Avenue
Jamaica, New York 11417
(212) 297-8400

A. T. Petrello Company
610 Fulton Avenue
Mt. Vernon, New York 10550
(914) M08-8561

B. Giancola
7825 River Road
Bethesda, Maryland 20014
(301) EM5-0700

Weaver Stone Company
Butler, Maryland 21023
(301) 771-4200

E. B. Osti Company
Jericho Pike
Bowie, Maryland 20715
(301) 262-9600
Washington, D. C. Area (cont'd)

Stonework by Santo
Rockville, Maryland 20800
(301) 929-1359

Battista Stone Company
10001 Seven Locks Road
Bethesda, Maryland 20014
(301) 365-7482

District Stone Works
1708 Overlook Drive
Maryland
(301) 365-7482

Roubon & Vaneiro
2820 Old Lee Highway
Fairfax, Virginia 22030
(703) 560-2750

Baltimore, Maryland

M. Grimaldi & Sons
(301) 866-8600

Patapso Natural Stone
(301) 433-1484

Boston, Massachusetts

Joseph Piccariello
(617) 774-1249

New England Cut Stone Company
(617) 288-1780

Providence, Rhode Island

James C. Goff
(401) 461-5800

Connecticut

Connecticut Stone Supplies
New Haven, Connecticut 06510
(203) 795-9767

Ring's End
Darien, Connecticut 06820

*If no complete address is given--phone number is supplied.
LIST OF ARCHITECTS SURVEYED

Charles Tolley, 314 W. Broad, Telford, Pennsylvania

Lancaster and Vicinity

Buchart Associates, 914 Columbia Avenue, Lancaster
Bishop & Landis, Architects, 212-1/2 W. High, Elizabethtown
McWellan & Smith, 2060 Temple Avenue, Lancaster
Lynch, David & Associates, 500 Golf Road, Lancaster
Reidenbaugh, Donald W. & Assoc., 232 N. Concord, Lancaster

Wilkes-Barre (W-B)

Eyarman-Csala & Assoc., 67 Public Square, W-B
Thomas Kearns, 341 Wyoming Ave., Pittston
Riggi & Riggi, 512 N. Blakly, Dunmore

Harrisburg and Vicinity

Bender Burrell Assoc., 3216 Trindle Rd., Camp Hill
Bogar & Bink Architects, 218 Pine Street, Harrisburg
Everhard & Barclay, 2023 N. 2, Harrisburg
Robt. M. Gemmell, 1729 N. Front, Harrisburg
Good, Long & Assoc., 902 N. 2, Harrisburg
Kochenor & Assoc., 1836 Anna St., No. Cumberland
Lacy Atherton & Davis Arch., 1729 N. Front, Harrisburg
Paul Long & Assoc., 8 Richland Lane, Camp Hill
Wm. Murray, 1600 N. 2, Harrisburg
Rodgers & Fredrick, 901 N. Camrun, Harrisburg
Robert Shaffer, 321 N. Front, Harrisburg
A. J. Piccola, 3901 Lexington Avenue, Harrisburg

Connecticut - Hartford and Vicinity

Peter Abel, 100 Constitution Plaza, Hartford
Austin & Meed, 100 Constitution Plaza, Hartford
Herbert F. Boege, 9 Haviland Road, Bloomfield
Butterfield & Assoc., 1 Park Drive, Hartford
Arthur H. Cook, 799 Main Street, Hartford
Danos & Assoc., 223 Sisson Avenue, Hartford
Flores-Jenkins Hannibal, 721 Main, Hartford
Huntington-Darbee & Dollard, 41 Lewis Street, Hartford
Calliker & Schoenhardt Architects, 924 Hopmeadow St., Simsbury
Jeter & Cook, 799 Main, Hartford
Kane Fauchild Farrell White & Rallis, Arch., 734 Asylum Avenue, Hartford
Kosinski Assoc., 215 Bishop, New Haven
Arnold Lawrence, 571 Porter, Manchester
Lyons & Mather, 2 Riverside Avenue, Bristol
Malmfledt Assoc., 799 Main, Hartford
Pepin Assoc., 37 Jerome Avenue, Bloomfield
Alfred Reinhardt, 357 E. Center Street, Manchester
Joseph Salerno, 544 Riverside Avenue, Westport
Sinclair Assoc., 1 American Row, Hartford
Connecticut (Cont'd)

Olson & Miller, 410 Asylum Street, Hartford
Wisniewski Assocs., 5 Elm Street, Windsor
Thomas Whaples, 99 W. Main, New Britain
Environmental Design Group, 31 High Street, New Haven

Doylestown and Vicinity

Bosak Robert A., 829 Linden, Allentown
Burton, Robert Ellis, 4 Boulder Creek Lane, Newton Square
Haag & d'Entremont, 445 Cedar Street, Jenkintown
Meloni & Vogel, Penns bury Plaza, Morrisville
Ruthrauff, Albert F., 425 Penna. Avenue, Lansdale

Allentown

Bond & Miller, 1 Lehigh Parkway, N. Allentown
Coston-Wallace, 1414 Millard, Bethlehem
Everett Associates, Commonwealth Building, Allentown
Heyl Trely Assocs., 4347 Hamilton Blvd., Allentown
Moore, Hugh Jr., 73 N. 2, Easton
Pharo & Haas, 1021 W. Broad, Bethlehem
Bauz J. Treheway & Assoc., 814 Monroe Avenue, Stroudsburg
Wisenberger, A. L., Assocs., 3440 Hamilton Blvd., Allentown
Lovelace & Spillman, 6 W. Broad, Bethlehem
Breslin & Ridyard, 1226 Union Blvd., Allentown
R. G. Assocs., 2150 Allen Street, Allentown

Wyoming Valley Directory

Allen Rodda & Assocs., 136 S. Franklin, Wilkes-Barre
Bohlin & Powell Architects, 182 N. Franklin, Wilkes-Barre
Burns & Loewe, Scranton Life Building, Scranton
Eyerman-Csala & Assocs., 67 Public Square, Wilkes-Barre
Hegarty Kears & Reilly Arch., 341 Wyoming Avenue, W. Pittston
Lacy Atherton & Davis, Hotel Sterling, Wilkes-Barre
Melone Anthony C., 67 Public Square, Wilkes-Barre
Schmitt, Carl J. & Son, 198 N. Main, Wilkes-Barre
Smith Miller & Assoc., 189 Market Street, Kingston
Valverde & Franco, 415 N. 8 Avenue, Scranton
Wassell & Pyros, Town Hall Bldg., Wilkes-Barre

Norristown-Conshohocken

Manfredi, Louis A., Little Avenue, Plymouth Township
Anderson & Casaccio, 700 Darby Road, Havertown
Brugger & Freeman, 400 W. Valley Forge Road, King of Prussia
Burton, Robert Ellis, 4 Boulder Creek Lane, Newton Square
David Freeman, 400 W. Valley Forge Road, King of Prussia
Heacock & Platt, 50 Byberry Road, Hatboro
Philadelphia and Vicinity

Assoc. Architects, 2120 Walnut Street, Philadelphia 19103
Ballinger Co., 1625 Race Street, Philadelphia 19103
Elias Bass, 704 Oak Lane, Philadelphia 19126
Bower Fradley Assoc., 2025 Walnut Street, Philadelphia 19103
Bureylnski & Assoc., 965 Bristol Pike, Andalusia 19020
J. Burris, 226 Spruce Street, Philadelphia 19106
Carroll Grisdale & Van Alen, 6 Penn Center Plaza, 16 N. 17th, Philadelphia 19103
Cassway & McGee, 269 W. Walnut Lane, Philadelphia 19144
Chappelle & Crothers, 258 S. Van Pelt, Philadelphia 19103
John A. Clauser, 2036 Rittenhouse Square, Philadelphia 19103
Gerald Cope, 1929 Delancey Plaza, Philadelphia 19103
William Cox, 210 S. 13th Street, Philadelphia 19107
Culbreath & Assocs., 1505 Race Street, Philadelphia 19102
Dagit Assoc., 1700 Race Street, Philadelphia 19103
Albert Davis, 21 S. 12th Street, Philadelphia 19107
William Dod, 5237 Chestnut Street, Philadelphia 19139
Eastwood & Rebeck, 1211 Old York Road, Abington 19001
R. Eilichman, 555 City Line Avenue, Bala Cynwyd
Ewing & Assocs., Rohn & Haas Bld., Philadelphia
G. Weing Co., Western Savings Fund Bld., Corner Broad & Chestnut, Phila. 19107
Maurice Fletcher, 226 S. 16, Philadelphia 19102
Fruchtb and Martin, 13th & Sansom, Philadelphia 19107
Robert Geddes, 2101 Pine Street, Philadelphia 19103
Gilfillan & Maymon, Architects, 117 S. 17th, Philadelphia 19103
Greenburg & Shogam, 226 S. 16, Philadelphia 19102
John Hanson, 400 S. Main, Phoenixville 19460
Hassinger & Schwam, 39 E. School House Lane, Philadelphia 19144
Hesser & Higgins, 3605 Chapel Road, Newton Square 19073
Hottinger Assoc., 1770 Lancaster Avenue, Paoli 19301
John Janney, 1616 Walnut, Philadelphia 19103
W. R. Keast, 1201 Chestnut Street, Philadelphia 19107
Kling & Assocs., 1401 Arch Street, Philadelphia 19102
Kolosky & Tannicci, 215 N. Broadway, Camden, New Jersey 08102
Nolen & Swinbrune, 120 S. 17, Philadelphia 19103
P. Kuhnle, 2036 Rittenhouse Square, Philadelphia 19103
S. Langberg, 2120 Walnut Street, Philadelphia 19103
Levinson Maxwell Assoc., Western Savings Fund, Corner Broad & Chestnut, Phila.
Howard Lidz, 2019 Rittenhouse Square, Philadelphia 19103
John Lloyd, 121 N. Broad, Philadelphia 19107
F. Loving, 1776 Benj. Franklin Parkway, Philadelphia 19103
Manfredi & Assoc., 2228 Mifflin Street, Philadelphia 19145
Norman Mansell, 300 E. Lancaster Avenue, Wynnewood 19096
Robert Martin, 226 S. 16, Philadelphia 19102
William McDowell, 8513 Germantown Avenue, Philadelphia 19018
Messers Smith Arnst, Architects Bldg., Philadelphia
Mitchell & Gurigola Assocs., 1727 Delancey Pl., Philadelphia 19103
Bruce Murphy, 1621 Sellers Street, Philadelphia 19124
R. Neely, 24 E. Springfield Avenue, Philadelphia 19127
Robert Noble, Arch. Bldg., Philadelphia
Oshiver & Assocs., 1425 Walnut, Philadelphia 19102
Davis Pearson, 12 S. 12th Street, Philadelphia 19107
Daniel Pfeiffer, 244 Radcliffe, Bristol 19007
Philadelphia and Vicinity (Cont'd)

Walter Poole, 21 S. 12, Philadelphia 19107
Rankin Kellog & Doe, 76 Wynnewdale Road, Narberth 19072
Raup Samuel Stephens & Assoc., 1534 Pine Street, Philadelphia 19102
Rietz & Rietz, 140 N. 17, Philadelphia 19103
Rosengarten & Assoc., 1321 Arch Street, Philadelphia 19107
George D. Savage, 450 N. Narberth, Narberth 19072
Frank Scheisinger, 68 E. Court, Doylestown 18901
Seidle Slocum & Smith, 16 E. Lancaster Avenue, Ardmore 19003
Samuel Shepherd, 6444 Cherokee, Philadelphia 19119
W. F. Sillman, 28 S. 18, Philadelphia 19103
D. Slocum, 266 S. 17, Philadelphia 19103
David Sonnenthal, 2031 Arch Street, Philadelphia 19103
Oskar Stanorov, 2207 Chestnut Street, Philadelphia 19103
Jack Thalheimer, 1315 Walnut Street, Philadelphia 19103
Tobiessen Wenger & Assoc., 42 E. Lancaster Avenue, Paoli 19301
Urban Design Assoc., 1625 Spruce Street, Philadelphia 19103
Joseph Varelo, 1515 Locust Street, Philadelphia 19102
Harold Wagoner, Architects Bldg., 117 S. 17th, Philadelphia 19103
Wallace McHarg Roberts & Todd, 1740 Cherry Street, Philadelphia 19103
Weise Frank, 307 S. Chadwick, Philadelphia 19103
Hugh Zimmers, 140 N. 17th Street, Philadelphia 19103
John Wright, Jr., 2123 Delancey Street, Philadelphia 19103
Adleman Siegel & Assoc., 1207 Spruce Street, Philadelphia 19107

Delaware

Wilmington, except where noted

Calvin Banwell, 222 Philadelphia Pike, Wilmington 19809
D. Carlton, 15 Boulder Brook Drive, Wilmington 19803
Dollar & Funk, 2005 Concord Pike 19803
Fagnani & Assoc., 1109 Jefferson Street 19809
J. Falini, 4113 Newport Gap Pike 19808
Richard Fox, 153 Chestnut Hill Road 19809
Howard Greenhouse, 305 W. 12th, 19801
Calvin Hamilton, 218 W. 9, 19801
Harte Assoc., Inc., Possum Park Mall
Homsey Victorine & Samuel, Inc., 2003 N. Scott, 19806
Marcus La France, 1002 N. Washington 19801
Marsili & Cooper, 222 W. 9, 19801
George McDermott, 2011 Baymaid Blvd 19802
Meconi Assoc., 1120 N. West Street 19801
Murrey & Harris Assoc., 226 W. 9 19801
Donald Nahgang, 75 E. Main 19807
Pei & Partners, 1207 N. Market, 19801
Pope Kuiske & McCune, 1116 West Street 19801
Robert Raley, 25 Buena Vista 19802
William Redgate, 2407 Limestone Road 19808
Steel Phillips & Assoc., 222 N. Walnut, West Chester, Penna. 19380
Thomas Walters, 1525 Concord Pike, 19803
Wason Tingle & Brust, 1508 Pennsylvania Avenue 19806
Waymon Moeckel & Carbonell, Bank of Delaware, 9th & Market 19801
New Jersey

Newark, except where noted

J. Albenberg, 11 Hill Street 07102
Bernosti & Goldberg, 939 Stuyvesant Avenue, Union 07083
Bernacki-Pooray & Assocs., 45 Park Street, Montclair 07042
Brown Jefferson Southern & Assoc., 196 Clinton Avenue 07108
Butler & Butler, 172 State, West Englewood 07666
J. Centannia, 259 Clifton Avenue 07104
Donald Chapman, 332 Springfield Avenue, Summit 07901
Joseph Comparetto, 100 Newark Avenue, Jersey City 07302
Fava, Becker & Murphy Assocs., 28 James, Newark 07102
Flat & Poole, 1246 Broad, Bloomfield 07003
Abraham Goodman, 618 Elizabeth Avenue, 07112
Gruzen & Partners, 24 Commerce 07102
Haines, Lundberg & Waehler, 58 Park Pl. 07102
Ralph Jefferson, 332 Springfield Avenue, Irvington 07111
Kutz & Metsky, 100 Evergreen Plaza, East Orange 07018
L. Khachadourian, 130 Washington, Bloomfield 01003
M. Klein, 2332 Morris Avenue, Union 07083
Jos. Kordys, 1093 Broad, Newark 07102
H. Korenstein, 220 Parker Road, Elizabeth 07208
Aaron Kraemer, 155 Maplewood Avenue, Maplewood 07040
Kenneth Krueger, 11 Hill 07102
John Lehman, 972 Broad 07102
Anthony Luppino, 506 Roseville Avenue
H. McMurray, 430 Morris Avenue, Elizabeth 07208
Monroe Metsky, 100 Evergreen Plaza, East Orange 07018
Robert Moran, 62 Eagle Rock Avenue, West Orange 07052
J. D. Nakiosis, 590 Belleville Turnpike, Kearny 07032
R. J. O'Neill, 90 Smith Street, Perth Amboy 08861
Valdemar Paulsen, 921 Bergen Avenue, Jersey City 07306
Gerald Phelan, 1051 Bloomfield Avenue, Clifton 07012
Rotwein & Blake, 714 Rahway Avenue, Union 07083
Emil Schmidlin, 50 Evergreen Plaza, East Orange 07018
Harmon Schroeder, 287 Bloomfield Avenue, Caldwell 07006
Davis Sichel, 40 Walnut Street 07102
Lawrence Stern, 60 State Highway, No. 10, Hanover 07936
Penick Vogel, 52 Brookside Avenue, Caldwell 07006
Zywotow & Eckert, 304 S. 12th 07103
George Siegler, 901 Broad 07102

Trenton, except where noted

H. Aitken, 150 E. State 08608
Bwing & Assocs., 10 Nassau, Princeton 08540
Buehler & Kudei, 1 West Main, Moorestown 08057
Joseph Carehide, 42 W. Lafayette 07848
R. Chlorton, 20 Nassau, Princeton 08540
Clauss & Nolan, 114 W. State, Trenton 08608
Phillip Collins, 33 State Road, Princeton 08540
W. C. Cramer, 114 W. State, 08608
Eshbach & Pullinger, 28 W. State 08608
Trenton (cont'd)

Gregory & Blauth, Goat Hill Road, Lambertville 08530
Hankin & Hyres, 495 W. Hanover, 08618
Richard Horowitz, 156 W. State 08608
Imhoff & Edwards, 280 Norwalk Avenue 08609
F. Kennedy, 7 Search Avenue, Pennington 08534
Kramer Hirsch & Carchidi, 42 W. Lafayette 08608
Paul Losi, 214 Washington, Toms River 08753
Man & Micklewright, River Road & Manor Gate, Yardby, Penna. 19067
C. McAuliffe, 2733 Nottingham Way 08619
Neubeck & Tatler, 495 W. State 08618
Henry Petty, W. 39 E. Main, Moorestown 08057
Arthur Rogers, 125 Morningside Drive 08618
Harrison Uhl, 33 State Road, Princeton 08540
Thomas Vail, 46 Bayard Street, New Brunswick 08901
William Wolf, 9 E. Union, Burlington 08016
Wiedersum Assoc., 180 W. State 08608
Diehl Miller Busselle, Arch., 4 Chambers, Princeton 08540
Fulmer & Bowers, 341 Nassau, Princeton 08540
Micklewright & Blanche, 90 E. Stuyvesant Avenue 08618
Gary Ryan, 42 Hamilton Lane, Willingsboro 08046
Ronald Vaughn, 36 W. Lafayette, 08608

New York

Manhattan, except where noted

Breuer Marcel & Assoc., 635 Madison Avenue 10022
Eggers & Higgins, 100 E. 42nd 10017
Frank Ackerman, 25 W. 45th 10036
Adlerstein Assoc. Architects, N. Plaza Bldg., Valley Stream, Long Island 11587
Roy Allen, 400 Park Avenue 10022
Anthemion Group Ltd., 514 West End Avenue 10024
Architects Design Group, 16 E. 52nd 10022
Architects Council of New York City, 104 E. 41st 10017
Derderian & Assoc., 556 Madison Avenue 10022
Avalone & Degenhardt, 31 Union Square 10003
Edward Barner, 410 E. 62nd 10021
Barnum Assoc., 250 Park Avenue 10003
Barton & Pruitt, 101 Park Avenue 10017
Harry Bates, 510 Madison Avenue 10022
Becket Wilton Assoc., 110 E. 59th 10022
Bental & Bental, 22 Buckom Rm Road, Locust Valley, Long Island 11560
Jess Berkman, 600 Madison Avenue 10022
Newton Beyin, 154 E. 61st 10021
Phillip Birnbaum, 18 E. 48th 10017
Andrew Blackman, 121 E. 36th 10016
Fred Bloch, 475 5th Avenue 10017
Vladimir Bobovitch, 616 W. 165th 10032
John Brady, 55 W. 42nd 10036
William Breger Assoc., 12 E. 53rd 10022
Samuel Brody, 12 E. 53rd 10022
Bugbee Burton Ashford, 121 E. 54th 10022
Jonathan Butler, 219 E. 44th 10017
Manhattan (Cont'd)

Carl Cali, 580 West End Avenue, 10024
Cair & Assocs., 80 W. 40th, 10018
Caudill Rowlett & Scott, 230 Park Avenue, 10017
Daniel Chait, 335 E. 22nd, 10010
Charles Luckman Assocs., 680 5th Avenue, 10019
Harvey Clarkson, 11 E. 44th, 10017
Murray Cohen, 260 5th Avenue, 10001
Conklin & Rossant, 251 Park Avenue South, 10010
John Cooke, 1270 5th Avenue, 10029
J. Costiopoulos, 30 South Drive, Hyde Park 12538
Crausman & Assocs., 332 E. 149th, Bronx 10451
Daidone & Assocs., 27 Park Place, 10007
Brady and Assocs., 130 E. 59th, 10022
Delano & Aldrich, 131 E. 36th, 10016
Anthony Derose, 384 E. 149th
Devcon, Inc., 10 #. 40th, 10016
Disanto & Assoc., 777 3rd Avenue, 10017
F. Duncun, 121 E. 54th, 10022
Edelman & Salzman, 434 6th Avenue, 10009
Facility Design Consultants Corp., 777 3rd Avenue, 10017
J. Feingold, 219 W. 78th, 10024
Edwin Forbes, 304 E. 45th, 10017
Alexander Gartner, 101 Park Avenue, 10017
Goldman Assocs., 230 Park Avenue, 10017
Gruzen & Partners, 1700 Broadway, 10019
Halsey McCormick & Helmer, 230 Park Avenue, 10017
Harrison & Abramovitz, 630 5th Avenue, 10022
Hill Associates, 230 W. 41st, 10036
Kahn & Jacobs, 2 Park Avenue, 10016
Jefferson & Cooke Architects, 1261 Fulton, Brooklyn 11216
Alvin Knoll, 238 Madison Avenue, 10016
G. Lawford, 304 E. 45th, 10017
Lindquist & Stonehill, 539 E. 81st, 10028
Meurer & Tuttle, 558 Madison Avenue, 10022
Geller & Associates, 220 Park Avenue South, 10003
Morgensen & Jones, 610 Plandim Road, Manhasset, L.I. 11030
Pisani & Falco Assocs., 33 W. 54th, 10019
Kurt Resch, 9 E. 68th, 10021
Rouse Dubin & Ventura, 55 W. 42nd, 10036
Schuman Lichenstein & Claman, 380 Lexington Avenue, 10017
Tippets, Abbet & McCarthy Stratton, 345 Park Avenue, 10022
Stickle International, 468 Park Avenue, 10022
Smotrich & Platt, 240 Madison Avenue, 10016
Serra & Assocs., 517 Broadway, Massapequa, L.I., 11758
Siegmund Spiegel, 2035 Hampstead Tpk., East Meadow, L.I., 11554
Vincent & Bertheelsen, 227 W. 13th, 10011
Weston Werder, 8 W. 40th, 10018
Frederick Woerner, 45 W. 34th, 10001
Zurmuhlen Grung, 200 E. 37th, 10016
R. Middleton, 444 Central Park West, 10025
Kornblath Assocs., 850 3rd Avenue, 10022
Syracuse, except where noted

Ginley & Jenner, 1828 South Avenue, 13207
Huebel Hares Glavin Partnership, Kemper Bldg.
G. Ketcham, 1208, James 13203
King & King, 420 E. Genessee, 13202
K. Lee, University Bldg., 120 E. Washington, 13202
MacKnight Kismse French & Sizing, 6443 Ridings Road, 13206
Mowry Teitsch & Surine Arch., 69 Albany Street, Cazenovia 13035
John Piedmonte, 1345 Milton Avenue, 13204
Sargent Webster Crenshaw & Folley, Arch., 2112 Erie Blvd., Eaton 13334
Suttoni Assoc., 314 Fayette Street, 13224
Sweeney-Burden, Lafayette Bldg., 210 E. Fayette, 13202
Turley & Mauri, 1004 E. Adams, 13210
Witt & Van Keuren, 2669 E. Genessee, 13224

Albany, except where noted

S. Arkell, 263 State Street, Schenectady, 12305
Norbert Blum, 32 Skyview Drive, West Cohoes
C. Cobban, 57 Dartmouth Street, 12209
James Duggan, 18 North Street, Schenectady, 12305
Geyer & Hollister Assoc., 231 Delaware Avenue, Delmar 12054
D. Hedlund, 152 Barrett Street, Schenectady 12305
L. LaDue, 35 Calvin Avenue, 12206
Link & Cullen Arch., 122 Jay Street, Schenectady 12305
William Marden, 159 Ontario, 12206
Irving Paris, 309 Ontario, 12206
Donald Stevens Assoc., Loudon & Menand Rds., Loudonville 12211
Robert Trudeau, 219 Forts Ferry Rd., Latham 12110
Wolf Kirman & Assoc., 20 Plaza, 12207
Pagano & Radzynski, 247 Murray Avenue, Delmar 12054
Gander, Gander & Gander, 174 Washington Avenue, 12210

Washington, D. C., except where noted

Adrian Wilson Assoc., 1825 Connecticut Avenue, N.W. 20009
Beach Assoc., 5034 Wisconsin Avenue, N.W., 20016
Harold Boutin, 1417 22nd, N.W., 20037
R. C. Archer, Jr., 215 Florida Avenue, N.W., 20001
Thomas Bourne Assoc., Inc., 2135 Wisconsin Avenue, N.W., 20007
Benham-Blair & Affiliates, 1625 Eye N.W.
Bowman & Assoc., 1030 15th N.W., 20005
Albert Cassell, 3633 18th N.E., 20018
Kenneth Cogan, 1212 16th., N.W., 20036
Kent Cooper, 1656 33rd, N.W., 20007
Cooper & Auerbach, 1912 Sunderland Place, N.W., 20036
Daniel & Mendenhall, 1725 I. N.W., 20006
William Denton, 1300 Connecticut Avenue, N.W., 20036
Donald Drayer, 1764 Church, N.W., 20036
Eggers & Higgins, 3526 K., N.W., 20007
Ralph Erickson, 5417 5th, Arlington, Virginia 22203
Fischer & Elmore, Arch., 1302 18th, N.W., 20036
E. V. Gauger, 1632 K., N.W., 20006
Graham & Assoc., 1767 P. N.W., 20036
Washington, D.C. (Cont'd)

Grigy & Laramore, 6000 Stevens Avenue, Alexandria, Virginia 22311
Hellmuth & Kassabaum, 1000 Connecticut Avenue, N.W. 20036
Hope & Assoc., 1028 Connecticut Avenue, N.W. 20036
Jenkins & O'Hear, 1156 19th N.W., 20036
Edwin Keeble Assoc., Inc., 1500 Massachusetts Avenue, N.W., 20005
Roger Lewis, 2233 Wisconsin Avenue, N.W., 20007
Thomas Madigan, 2030 16th, N. Arlington, Virginia 22209
Lyles & Wolf, 1120 Connecticut Avenue, N.W., 20036
Metcaif & Assoc., Arch., 1156 19th N.W., 20036
Mumma & Assoc., 1071 Wisconsin Avenue, N.W., 20007
R. Nelson, 1019 22nd, N.W., 20037
Jerome O'Conner, 810 18th N.W., 20006
Perkins & Will Partnership, 1030 15th, N.W., 20002
Walter Ramberg, 1609 Connecticut Avenue, N.W., 20007
Rose & Crowe, 1900 L. Street, N.W., 20036
Satterlee Nicholas & Assoc., 1820 Mass. Avenue, N.W., 20036
Robert Scholz, 918 16th Street, N.W., 20006
Warren Shoemaker, 4750 Wisconsin Avenue, N.W., 20016
Sheriden & Behm, 1011 N. Highland Street, Arlington, Virginia 22201
Smith Associates, 1056 Thomas Jefferson Avenue, N.W., 20007
Austin Spriggs, 2214 M Street, N.W., 20037
Stottler Staggs & Assoc., 7100 Baltimore Avenue, College Park, Va. 22401
Ernest Syme, 412 5th Street, N.W., 20001
Fredrick Tilp, 1620 2nd Street, S.W., 20024
Frederic Wiedersum, 1308 19th N.W., 20036
World Wide Consultants, 1330 New Haven Avenue, N.W.
Robert Yale, 2609 P Street, N.W., 20007
Sawyer Young, 4201 Lee Highway, Arlington, Virginia 22207

Maryland

Baltimore, except where noted

J. Ahlers, 3915 Greenmount Avenue, 21218
Beck Mark Assoc., 202 Washington Avenue, 21204
J. Browne, 2435 N. Calvert, 21218
Cochian Stephenson & Donkervoort, 925 N. Charles, 21201
Daniel Mann Johnson & Medenhall, 222 St. Paul, 21202
James Edmunds, 1025 St. Paul, 21202
Fisher Nes Campbell & Partners, 2120 N. Charles, 21218
Gehry Walsh & O'Malley, 714 Park Avenue, 21201
Edward Hofstetter, 2427 Maryland Avenue, 21218
G. E. Kosritsky, 806 Cathedral Street, 21201
Paul Marks, 209 Chesapeake Avenue, Towson 21204
Nelson Associates, Hillindal Office Building
Peterson & Brickbauer, 106 W. Madison, 21201
E. Rogers, 6 S. Calvert, 21202
T. Silcox, 2 W. Preston Street, 21201
Sulton & Campbell, 2503 St. Paul Street, 21218
Taylor & Fisher, 130 W. Hamilton, 21201
Watkins & Magee, 2526 St. Paul Street, 21218
L. White, Jr., 1009 N. Calvert, 21202
Leo Wittstadt, 4507 Harford Road, 21214
Connecticut

New Haven, except where noted

Ahlstrom & Lee, 153 Wooster, 06511
Berman Alden & Assoc., 43 Whitney Avenue, 06510
Conway & Associates, 35 Worth Avenue, Hamden, 06514
Davis & Noyes, 29 Whitney Avenue, 06510
Hamblin Associates, 1118 Main Street, Bridgeport 06604
McGowan & Fowler, 104 Audubon, 06510
H. Newman, 300 York, 06511
W. Petchler, 405 Temple Street, 06511
Polak & Sullivan, 624 George Street, 06511
Schilling & Goldbecker, 18 Trumbull Street, 06511
Westcott & Mapes, 109 Church Street, 06510
Arneill Bruce Porter Arch., 908 Howard Avenue, 06519
Sidney Miller, 59 Canner, 06511
C. Cooke, 17 Broadway, 06511

Rhode Island

Providence, except where noted

Architectural Design Associates, 12 Thomas Street, 02903
Carone Associates, 1635 Smith Street, N. Providence, 02908
D. Conloss, 152 Warren Avenue, E. Providence, 02814
P. Eddy, 33 Acorn, 02903
Charles Fink, 52 Arcade, 02919
Harkness, & Gedder, 274 Weybit Street
Cruise & Partners, 423 Industrial Bank Building, 111 Westminster, 02903
Lamborghini & Pipka, 36 Hemlock, 02910
Raymond Menard, 9 Steeple, 02903
J. Mosher, 77 Washington Street, 02903
Donald Reed, 274 Weybster
Lloyd Turoff, 335 Angell Street, 02904
William Warner, 30 Benefit Street, 02904

Massachusetts

Boston, Mass., except where noted

Rich. Abbot, 140 Newbury Road, Boston
Alpers & Bedar Assoc., 344 Newbury
Gordon Anderson, 103 Moody, Waltham
Architects Design Group Inc., 535 Boyle Street
Ashley, Myer & Assoc., 14 Arrow Street, Cambridge
Louis Bakanowsky, 1000 Mass. Avenue, Cambridge
Beacon Architectural Assoc., 8 Beacon Street
Martin Bloom, 2 Park Square
Renald Boretti, 177 Milk Street
Boston City Hall Architects, Government Center
Arthur Brooks & Assoc., 115 Brattle, Cambridge
Brick & Associates, 1680 Mass. Avenue, Cambridge
CAPA Architectural & Planning Assoc., 177 State Road
Boston, Mass. (Cont'd)

Cambridge Seven Assoc. Inc., 1000 Massachusetts Avenue, Cambridge
Carroll & Greenfield, 729 Boyle Street
Childs Bertman Tseckares Assoc. Inc., 54 Lewis Wharf
Commonwealth Architectural Assoc., 177 State Street
Curtin & Riley, 45 Newbury Street
Davies & Wolf, 14 Arrow Street
Desmond & Lord, 6 Beacon Street
D'Oisi & Co., 44 Piedmont Street
Eisenberg Assoc., 29 Temple Plaza
Era Inc., 1300 Soldiers Field Road, Brighton
Lewis Fink, 131 State Street
Freeman-Hardenbergh Assoc., Inc., 12 Arrow Street, Cambridge
Gilbert Assoc., 8 Merrimack Street, Lowell
Goldburg Bertrand Assoc., 641 Huntington Avenue, Roxbury
Phillip Graves, 209 Newbury Street
Griswald & Ames, 53 State Street
Hamlen & Hearney Assoc., 83 Newbury Street
Henneburg & Henneburg Arch., 806 Mass. Avenue
Herb Assoc., 31 Stanhope Street
Jacobs Assoc., 316 Staurt Street
Isidos Richmond & Carnez Goldberg, 30 Newbury Street
Knight Badge & Anderson, 73 Tremont Street
Lange & Lambert, 25 Huntington Avenue
Maginnis & Walsh & Kennedy, 126 Newbury Street
Samuel Mintz, 148 State Street
Nigiosh Assoc., 23 Miner Street
Pierce & Pierce, Arch., 116 Newbury Street
Whiteman & Howard, 89 Broad Street
The Architects Collaborative Inc., 46 Brattle Street, Cambridge
Sprague Associates, 10 Kirkland Road, Cambridge
Risman Assoc., 561 Boyle Street
Sasaki Rowson De Maz Assoc. Inc., 23 Main Street, Watertown
Smith Sellew & Doherty, 54 Canal Street
Von Storch & Burkavage, 700 Commonwealth Avenue

Virginia, Richmond and vicinity

Armstrong & Salomonsky, 2311 E. Broad, Richmond
Brown & Gusham, 106 E. Cary, Richmond
John Efford, 3810 Augusta Avenue, Richmond
Glove Newman & Anderson, Arch., 2S Foushee, Richmond
Hardwicke & Partners, 3206 Cutshaw Avenue, Richmond
LBC & Parris, 7800 Topaz Road, Richmond
Machbrey & Parris, 3805 Cutshaw Avenue, Richmond
James Rawlings, 1000 N. Thompson, Richmond
Thomas White, 627 E. Main, Richmond
Walten Madden Cooper & Auerbach, 230 Wilson Blvd., Arlington
Lyles Bissett Carlisle & Wolf, 315 S. Washington Avenue, Alexandria
Grigg Wood Brown & Laramore, 6000 Stevens Avenue, Alexandria
Spector Peake & Howell, 207 W. Broad Street, Falls Church
William Olderman, 2206 Pacific Avenue, Virginia Beach
Breindage Cohen Holten & Kroskin, 4100 Building, Norfolk
Washington & Assoc., 711 W. 21st Street, Norfolk
Virginia (Cont'd)

Forrest Coile & Assoc., 3415 Warwick Bldg., Newport News
McGaughy Marshall & McMillan, 220 W. Freesman Street, Norfolk
Pentecost & Mclellan Arch., 7460 Tidewater Drive, Norfolk
Leavitt Associates, 4400 Colly Avenue, Norfolk
Carlton Goodwin, 40 Plaza Shopping Center, Virginia Beach
Edward Wall, 1369 Laskin Road, Virginia Beach
Yates Boggs Berkly, 1301 Rddman Avenue, Portsmouth
Wright Marcellus & Partners, Crozet House, 100 E. Main, Richmond
McElroy & Baldwin, 1600 E. Little Creek Road, Norfolk
APPENDIX 3. SURVEY PROCEDURES

OUTLINE FOLLOWED IN PERSONAL INTERVIEWS
WITH STONE DEALERS

Data to be gathered:

1) Site of dealer
   a) Absolute
   b) Relative to others

2) Who dealers buy from (Supply)
   a) Procedures for buying

3) Who they sell to (Demand)
   a) Site distribution a type of buyer
   b) Purpose for which they buy

4) Price Derivation
   a) Transportation
   b) Product
   c) Services

5) Market
   a) Substitution effects
      i. other dimension stone
      ii. man-made materials
   b) New uses for product
   c) Consumer knowledge
   d) Forecast of demand
      i. dimension stone in general
      ii. P. B. S.

Names of architects and masons from dealers.
1.) Of your total stock of stone, approximately what per cent is made up of bluestone?

0% <25% 25-50%

50-75% 75-100%

2.) Does your bluestone come from

Pennsylvania New York Both

Other (specify)

3.) Is the quality (good surface, no reeds, correct size) of bluestone that you receive

Good Poor Average

4.) Do you prefer to obtain your stone from individual quarries Brokers central suppliers in quarry area your own quarries?

5.) In the future do you think the demand for bluestone will increase decrease, or remain constant?

6.) What in your opinion is a major problem with bluestone?

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Comments:

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QUESTIONNAIRE SENT TO ARCHITECT

BLUESTONE AND DIMENSION STONE QUESTIONNAIRE
A Public Service Study for the Building
Industry by Penn State

Name of Firm (Optional)______________________________

Please check spaces that most closely match your situation; more than
one check may be necessary for some answers.

(1) What type of buildings do you design?

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<th>Some</th>
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<tr>
<td>Other (specify)</td>
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(2) How did you become aware of Bluestone?

01 Other Architects  04 Never heard of it
02 Trade Journals    05 Stone Salesmen
03 Stone Dealers     06 Stone Mason
                      07 Other (specify)________________________

(3) Have you specified dimension stone or Bluestone for your projects?

<table>
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<tr>
<td>May be Bluestone</td>
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<td>(name?_______________)</td>
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(4) How do you use dimension stone and Bluestone?

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<td>2 Pattern floor (outdoor)</td>
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<td>3 Treads</td>
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<td>4 Veneer (ashlar)</td>
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<td>5 Wall panels (preassembled)</td>
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<td></td>
</tr>
<tr>
<td>6 Other (specify)</td>
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</table>

aKey for tabulated results in Table 7.
(5) Do you expect use of dimension stone and Bluestone to increase?  

<table>
<thead>
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<th>Bluestone</th>
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<tr>
<td>3</td>
<td>Remain the same</td>
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<tr>
<td>4</td>
<td>Do not know</td>
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(6a) Why do you select a particular stone for use in preference to other dimension stones?  

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<td>Color</td>
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<tr>
<td>3</td>
<td>Texture</td>
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<td>4</td>
<td>Cost (relative to other dimension stone)</td>
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<td>Technical specifications</td>
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<td>6</td>
<td>Reputation of stone dealer</td>
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<tr>
<td>7</td>
<td>Recommendation of Mason</td>
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<td>8</td>
<td>Other (specify)</td>
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</table>

(6b) Are these the criteria you use for Bluestone?  Yes____ No____

(7) What will tend to change the quantity of dimension stone used during the next five years?  

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<th>A Factor</th>
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<td>3</td>
<td>Base cost relative to other materials</td>
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<td>Availability of stone masons</td>
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<td>Installed cost relative to other materials</td>
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<td>Adequate supply of stone</td>
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<td>Other (specify)</td>
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<td>8</td>
<td>Do not know</td>
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(8) What type of information would you find useful to have about Bluestone?  (please specify)  If you don't have time to complete now, please return without answer to question 8. High percentage response is important to the success of the survey.

---

aKey for Table 7.
## APPENDIX 4.

### TABULATED RESULTS OF ARCHITECTURAL SURVEY

(Broken Down By Type of Architect)

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69
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<td>Public Architects (34)</td>
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Notes: 1) Some questions received more than one answer.
2) Number after code equals number that answered that question.
3) Number in parenthesis indicates total who responded.
4) See Sample Questionnaire for key.
LIST OF REFERENCES


Pennsylvania Bluestone Association, Personal Communication.


