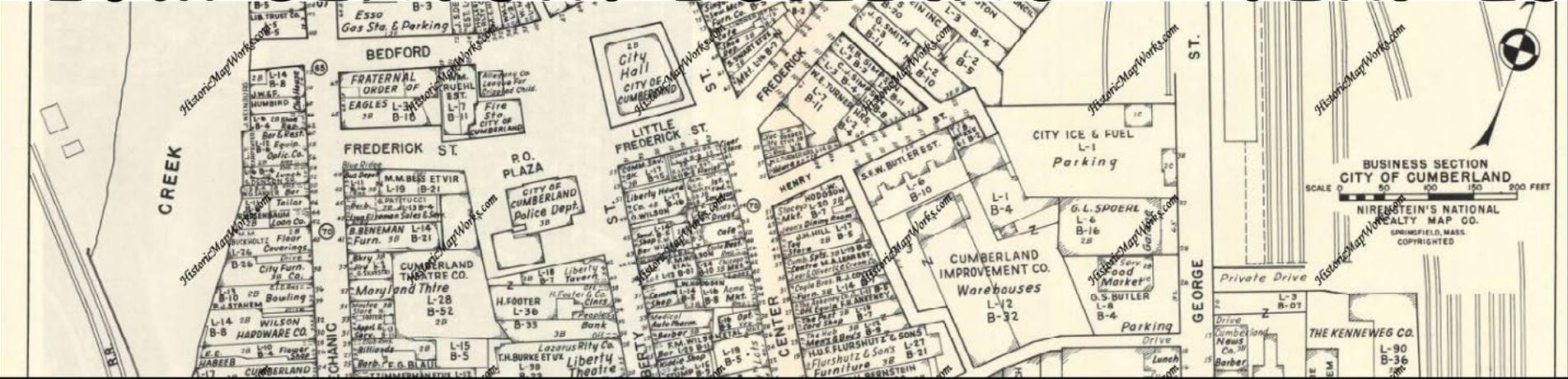


# APPENDIX B

# 20th CENTURY BUILDING MATERIALS



## 20th Century Building Materials

Twentieth-century materials like structural glass and metal siding, some of which the Historic Preservation Commission encourages to maintain and restore, are less understood than traditional wood, stone, and brick construction. This section is intended to provide an introduction to these “newer” 20th century materials and to provide some general maintenance guidelines for property owners dealing with building materials most common to the District. This appendix is not intended to encourage the use of many of these materials, as they are often incompatible with historic materials. It is crucial that property owners consult with the Preservation Coordinator and with the HPC before considering the use of replacement material.

## Asbestos Cement

### ROOFING

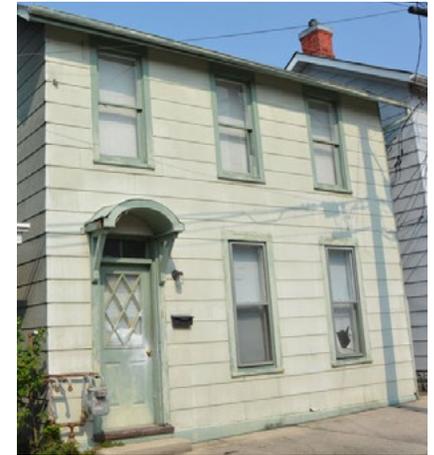
Asbestos cement was developed in the early 20th century when manufacturers began reinforcing Portland cement with asbestos fibers. This created a fire-resistant and durable material. In its early history, it was primarily used as insulation for heat generating equipment such as boilers.<sup>1</sup>

Asbestos-cement sheets were first developed and produced in 1907. It was around this time that shingles and panels for roofs and walls began to be manufactured in the United States.<sup>2</sup> The use of Asbestos-cement as a roofing material was promoted by the National Board of Fire Underwriters, who, in 1916 underwent a campaign to advocate for the elimination of wood shingles, which were considered a fire hazard.<sup>3</sup>

By the 1920s, asbestos-cement roofing shingles were available in a variety of colors including grey, red and blue-black. These colors were designed to mimic slate and terracotta tiles.<sup>4</sup>

### SIDING

Asbestos cement siding became popular in the first half of the 20th century. The earliest versions of this product consisted of individual shingles which were produced in square, rectangular, and hexagonal forms. In the late 1930s, long planks resembling weatherboard were produced and gained popularity. These early siding products had a smooth finish, but by the 1940s a product with a wood grained finish was produced and proved to be extremely popular.<sup>5</sup>



Asbestos siding (118 Hanover Street)

Asbestos siding was produced in a variety of colors. Shades of white, gray-pink, and gray-green were the most popular colors in the earlier years of asbestos siding production. In the 1950s, during the housing market boom in the United States, manufacturers began to offer the siding in a wider variety of colors. Deep browns, green, and coral were popular choices during that time. Asbestos siding was also frequently painted as homeowners tired of their color selections over the years.<sup>6</sup>

Asbestos siding and roofing products remained popular through the 1970s. Their use and production steeply declined after that time, as the United States Environmental Protection Agency began to regulate asbestos-containing materials.<sup>7</sup>

## Asphalt

Asphalt roofing was developed in the mid-19th century. Early versions of the product were produced in the form of roll-roofing. These rolls were produced by coating sheets of felt with a bituminous substance, such as pine tar. Aggregates, such as cinders, gravel, crushed stone, and sand, were pressed into the tarred surface. The long strips of the product were sold in rolls, and installed on roofs as overlapping strips.<sup>8</sup>

By 1903, hand-cut asphalt shingles were gaining popularity. Rectangular and hexagonal shapes were the most popular, and generally, the roofer installing the product would custom cut the shingles from the roll roofing by hand. As the industry developed between 1900 and 1920, manufacturers introduced pre-cut asphalt shingles. Shingle sizes and shapes were became quite varied, and by the 1920s shingles were available in angular forms, curved and scalloped forms, and with random-cut ends to create a rustic look. The multi-tab strip shingle, which was a single shingle with notches to create the look of multiple shingles, was developed during this period.<sup>9</sup>

In the 1930s, with the onset of the Great Depression, manufacturers were forced to cut back production because of a general decrease in building in the country. Around that time, shingle dimensions and shapes became standardized, while the range of colors and textures in production increased. Textured shingles were popular in the 1940s and 50s, and blue was the most popular color (Forrest service and Jester).<sup>10</sup>

## Cast Stone

Cast stone is similar to concrete blocks, in that it is made from a highly refined form of concrete formed to mimic stone. It was generally seen as a cheaper alternative to natural stone. Cast stone blocks are formed from Portland cement and a mixture of fine and coarse aggregates and

is manufactured as veneers, blocks, and various decorative elements.<sup>11</sup>

Cast stone began to become commercially available in the late 1860s, as the demand for concrete products increased after the Civil War. By the late 1920s, cast stone was available in various formulations to mimic many different types of natural stone. Construction was limited during the Great Depression and demand for cast stone dropped during the 1930s.<sup>12</sup>

Cast stone was generally used as if it were natural stone. It can be seen in a variety of applications including water tables, lintels, window sills, steps, quoins, belt courses, and other ornamental applications. It was used in residential as well as commercial and institutional buildings.<sup>13</sup>



Cast Stone (150 North Mechanic Street.)

## Concrete Block / CMU

Concrete block, or CMU (Concrete Masonry Unit), is a ubiquitous product. These pre-cast blocks of concrete are produced from a mixture of Portland cement and aggregates. The pre-cast blocks are generally hollow, with two to three interior voids. The CMU blocks we know today were developed ca. 1900 and have been consistently in use in American building construction since that time. CMU saw steady growth in popularity and use from its development at the turn of the century through 1920. In the early years, different manufacturers produced concrete blocks in various sizes, however, by 1924, a collection of different concrete block manufacturer associations agreed

on a standard size of 8-by-8-by-16 inches. By 1930, that size was by far the most common. As their popularity increased, improvements to their design and manufacture were made, including the introduction of lighter weight aggregates such as pumice and industrial byproducts including slag and cinders.<sup>14</sup>

Concrete blocks gained popularity because they were inexpensive and easier and faster to install than traditional masonry materials such as brick and stone.

Early CMU block manufacturing machines made blocks with decorative faces which imitated other materials like stone and brick or featured decorative elements like scrolls, wreaths, and roping in relief. The most popular decorative CMU blocks during the period spanning 1900 to 1930 was a rusticated block which imitated quarry-faced ashlar. After the 1930s, utilitarian plain-face blocks became the most popular.<sup>15</sup>

In the early 20th century, concrete blocks were commonly used for foundation and basement walls and as partition walls. Decorative rock-faced blocks were commonly used for foundations visible from the exterior, while plain-faced blocks were generally used for partitions and exterior walls. Such walls made from plain-faced blocks were covered with other materials such as plaster for interiors and stucco for exteriors.<sup>16</sup>

## **Metal Hardware**

### **STEEL**

Stainless steel was developed at the turn of the 20th century. In the late 1920s and early 1930s, stainless steel products began to be marketed for architectural purposes. Such products included stainless steel trim, hardware, elevator and entryway doors, as well as decorative spandrel

panels for exterior use in store fronts and skyscrapers.<sup>17</sup>

### **ALUMINUM**

The earliest recorded American use of aluminum for an architectural purpose was a pyramidal aluminum cap which was cast for the Washington Monument in 1884, however, the manufacturing process was cumbersome and costly and wide scale use of the metal did not occur until the early 20th century, at which time processes for extruding aluminum made it possible to fabricates windows, doors, handrails and similar elements. These aluminum products flooded the market in the 1920s and steadily gained popularity. It was immensely popular in the Art Deco and Streamline Moderne styles.<sup>18</sup>

Aluminum was also used in numerous other architectural applications including spandrel panels and hardware for curtain wall construction, store front elements, window sashes and frames, trim, railings, grilles, and signs.<sup>19</sup>

## **Metal Siding**

### **STEEL**

The first patent for steel or “sheet-iron” siding was granted in 1903. In its early inception, it was used on a limited basis, as it was prone to rusting due to exposure to weathering. An Indiana machinist, Frank Hoess, sought to improve upon the steel siding by manufacturing it with interlocking flanges on the top and bottom to help seal out moisture. He patented his steel clapboard siding in 1939, and it was used in some small housing developments around that time, however, the onset of World War II placed a huge strain on the steel industry and the development and use of steel siding was stopped.<sup>20</sup>

## ALUMINUM

After the War, the housing shortage revived interest in the metal siding industry. Around 1946, Hoess began producing his interlocking clapboard siding in aluminum rather than steel, as the material was lighter weight and more resistant to weathering. His product was generally installed in its raw form and left to weather or was primed and painted as wood would be. In 1947, Jerome Kaufman invented a process produce aluminum siding with a baked enamel coating and formed the Alside Company. In the early years, the siding was produced in a limited color scheme including white, gray and cream with additional pastel hues introduced as the products became more popular. The siding was produced in both smooth and textured surfaces, and accessories in aluminum such as soffits and trim were also produced.<sup>21</sup>

Aluminum siding was regarded as an inexpensive and durable material that could be installed easily and quickly. Manufacturers promoted aluminum siding as resistant to rot and fire. As the post-war demand for new houses declined, manufactures marketed



Aluminum siding at 49-51 North Centre Street

aluminum siding installation as a method to modernize buildings with old, “outdated” wooden siding. The use of aluminum siding peaked in the 1970s, as vinyl siding was popularized in the mid-1960s and quickly began to surpass aluminum as the preferred low-cost, low-maintenance siding product.<sup>22</sup>

## Metal Windows

### STEEL

Metal windows were available as early as 1860 in the United States but did not become largely popular until after 1890. Advancements in technology around that time allowed the mass production of rolled steel windows which allowed them to be produced for a cost that could compete with conventional wood windows. The products were popular for their low cost, low maintenance needs, and fire resistance.



Steel upper-story windows at  
44 Baltimore Street

Steel windows were popular for industrial buildings at the turn of the 20th century and were also frequently used in domestic buildings and commercial properties through the mid-20th century and through the 1960s.<sup>23</sup>

### ALUMINUM

Aluminum windows became popular in the United States in the early 20th century. Aluminum windows were regarded as a light-weight alternative to steel and came to be regarded as more durable than conventional wood windows.

## Structural Glass

Structural glass is the general term for colored opaque architectural glass slabs sold under a variety of common trade names including Carrara, Vitrolite, Opalite, Glastone, and Sani-Onyx. Structural glass was first developed around 1900 and was marketed for its sanitary properties. Because it was nonporous and could be produced in large

## PRESERVATION DISTRICT DESIGN GUIDELINES

### 20th Century Building Materials

sheets, it was desirable for uses in aseptic conditions such as in hospitals. Structural glass was generally used in utilitarian applications during the first two decades of the 20th century – it was commonly used as wainscoting and flooring in bathrooms, corridors, laboratories, and operating rooms, as well as for table tops and bank counters.<sup>24</sup>

Prior to the late 1920s, the majority of structural glass being produced in the country was available in black or white. In the 1930s, multiple manufacturers began to produce the product in a range of colors, and by the late 1930s, more than 30 colors were available. In the earlier years, satin finishes in soft colors were the most popular, however, by the 1930s glossy finishes in vivid tones were in style.<sup>25</sup>

Structural glass achieved the peak of its popularity in the 1930s and 40s as Art Deco, Art Moderne, and Modernist were the height of fashion. The material was sometimes used as in spandrel applications in curtain wall construction but was also extensively marketed for modernizing the exteriors of existing storefronts and commercial buildings.<sup>26</sup>

## Terra Cotta Tile

Fired clay has been in use for pottery and building construction since ancient times. Architectural terra cotta production began in the United States in the late 1860s. While terra cotta tiles were a popular roofing material in some areas of the United States from colonial times through the 19th century, modern use of terra cotta tile generally focuses on



Structural glass storefront at  
24-26 Centre Street

cladding and decorative applications.<sup>27</sup>

Changes in building technology in the 1890s allowed the development of skeleton framed buildings which required a cladding system. Terra cotta was a popular and relatively inexpensive material for spandrel panels, mullions, belt courses, and cornices. These applications were popular in the 1910s and 20s. At the same time, individual ornamental elements were developed for smaller scale applications on storefronts and high-rise buildings.<sup>28</sup>

## Vinyl

### SIDING

Vinyl siding was developed in the early 1960s. The product is formed by extrusion and is designed to imitate wooden clapboard siding. The first vinyl siding products were produced by Crane Plastics, a manufacturer in Columbus, Ohio.<sup>29</sup>

In the early years of its production the blending of colors was done manually. It was a difficult process which resulted in an inconsistently colored product. Beginning around 1970, production methods and formulations were changed. This resulted in a cheaper product which became available in a wide range of colors which helped to increase the product's popularity.<sup>30</sup>

By the late 20th-century, vinyl siding had generally come to replace aluminum siding as the preferred low-cost, low-maintenance siding in the United States.



Vinyl siding at 607 Washington Street

## WINDOWS

Vinyl windows were first produced in Germany in 1954. They were developed due to post-war wood shortages and high costs of aluminum in the country at that time. Vinyl windows were produced in the United States in the mid-1960s but did not gain widespread popularity until the mid to late-1970s. Vinyl windows were promoted for their insulating capacity and became popularized due to their competitive price with wood and metal windows.<sup>31</sup>



Vinyl window replacements on 138-140  
Polk Street

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