

**One Man's Trash Is Another Man's
Treasure: The Transition Of Clinker Brick
From Disposable To Decorative**

Alafia Akhtar

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Abstract

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Alafia Akhtar

Professor Norman R. Weiss, advisor

The exact origin of the name clinker brick is unknown, however it is said that the name may have been derived from the “quality imparted by vitrification, which causes them to give a clinking sound when struck.” In England, the 1836 Penny Cyclopedia described clinkers (also known as burrs) as “black-looking masses of vitrified brick...” The historian, Charles Thomas Davis described them as “ruptured” and by 1912 the closest definition to its current form, was given by Geologist Heinrich Ries who called the brick “roughened, discolored, and distorted.”

Historically, the accidental formation of clinker brick was caused by being situated too close to the heat source of a stationary kiln. This resulted in a loss for brick makers forcing them to discard the material. In the late nineteenth century, as brick production became more uniform, clinker brick were eliminated. However, simultaneously an aesthetic shift occurred, embracing the irregularity of the brick. This phenomenon was witnessed in the architecture of the Arts and Crafts Movement and Tudor Revival. Architects of these styles believed in an anti-industrialist ideology, emphasizing craftsmanship and the use natural local materials that embodied roughness, variation, and irregularity within architecture. They used the warped features of clinker brick to impart what they believed was a rustic aesthetic and an instant sense of age to a structure. In major cities, the popularity of clinker brick was illustrated through its implementation on apartment buildings especially “garden apartments” during the construction boom of the 1920s. The material was used in conjunction with varied architectural styles (apart from the two it was primarily associated with). The misshapen brick allowed for builders to differentiate residences in an increasingly growing metropolis of similar structures.

Though the brick embodied the ideologies of the Arts and Crafts and Tudor Revival visually, philosophically their use was contradictory. The two styles emphasized unaltered natural materials however, as clinker brick rose in popularity they became a mass produced commodity, heavily monitored to achieve a perfect distortion. This eliminated its natural ability to mirror the textures of nature, but instead it was forcefully used to *stage* such an aesthetic. Additionally, the Arts and Crafts movement sought after making crafts affordable to the average person. However, because of clinker brick's popularity and time consuming production process, its price rose significantly higher than the average common brick. Despite the philosophical irony in the use of clinker brick, by the early twentieth century, the material was highly popular and produced by various brick manufacturing companies throughout the country.

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This thesis dedicated to my incredible parents, sisters, and Rahil.

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Introduction

Clinker brick were historically a distorted brick produced under high temperatures during the firing process. Prior to the late nineteenth century they were deemed a waste product. However, due to an aesthetic shift in architecture the material rose in popularity, value, and price, providing vibrancy to a building, through vivid textures and colors. To understand the shift, this thesis aims to answer the following questions: When did clinker brick transition from being an accidental, undesired material, to being purposefully manufactured, and utilized as a decorative feature in architecture? Was this surge of popularity due to the rise of the Arts and Crafts movement and the Tudor Revival?

Understanding the history of an architectural material such as clinker brick is important for its preservation. Knowledge of the brick's historic use and value in architecture and society can help better assess the significance of the structure it is used on, providing historic preservationists with tools to better protect the building. Additionally, this information may help conservators decipher appropriate methods of stabilization and reproduction that would keep the value of the material intact.

Chapter 1

Clinker Brick: An Accidental Product

1.1 Origin of the name and definition of Clinker Brick

Clinker brick as we know them today are hard, unpredictably colored, and deformed. The name originated from the Dutch word *klinckaerd*, which literally translated to something that *klinken* or clicks. It was a term used for the ringing sound made when vitrified brick were struck together.¹ Eventually *klinckaerd* transformed into *klinker*, a word that evolved into what is now “clinker” in the English language.²

One of the earliest definitions of clinker brick was in the 1723 *Lexicon Technicum or, An Universal English Dictionary of Arts and Sciences*. The text stated: “Clinker are such Bricks which are glazed by the Heat of the Fire in the making.”³ In 1764, *The Complete Dictionary of Arts and Sciences: In Which The Whole Circle of Human Learning Is Explained*, used the same definition, however it was incorporated into a description for Dutch brick. The definition read as follows: “Dutch or Flemish bricks, used to pave yards and stables, and for soap boilers vaults, and cisterns: clinkers, such bricks, as are glazed by the heat of the fire making.”⁴ These brick morphed into the name “Dutch clinkers” which were very-hard brick, frequently used for paving.⁵

The clinker brick used on buildings of the late nineteenth and early to mid-twentieth century, are more than simply vitrified, glazed paving brick. The definition of the brick first began to differentiate itself from Dutch clinkers in 1836, in the English *Penny Cyclopaedia of the Society of the Diffusion of Useful Knowledge*. The text defined the brick (also known as burrs in England) as: “black looking masses of vitrified brick that are worth 10s a load... *burrs* or clinker brick are those which are much vitrified in the fire: sometimes 100,000 of them have run together in one mass. Brick having a smoothed or glazed

¹ Robert Etheridge and John Wesley Judd. *The Geology of Rutland and Parts of Lincoln, Leicester, Northampton, Huntingdon, and Cambridge*. London: Longmans and Company, 1875. 199.

² The Free Dictionary by Farlex. 2013. "Clinker." <http://www.thefreedictionary.com/clinker> (accessed February 6, 2013).

³ John Harris. *Lexicon Technicum: or an Universal English Dictionary of Arts and Sciences Volume II*. London, 1723. "Bricks."

⁴ Samuel Clark, Temple Henry Croker, and Thomas Williams, editors. *The Complete Dictionary of Arts and Sciences: In Which The Whole Circle of Human Learning Is Explained*. London: J. Wilson and J. Fell, 1764. "Brick."

⁵ A.C. Smeaton. *The Builder's Pocket Manual: Containing the Elements of Building, Surveying, and Architecture*. London: William Jackson, 1837. 11.

surface are sometimes made: this is done in the burning.”⁶ It then stated that Dutch clinkers “differ from the bricks just described....The Dutch clinkers are small hard yellow bricks...”⁷

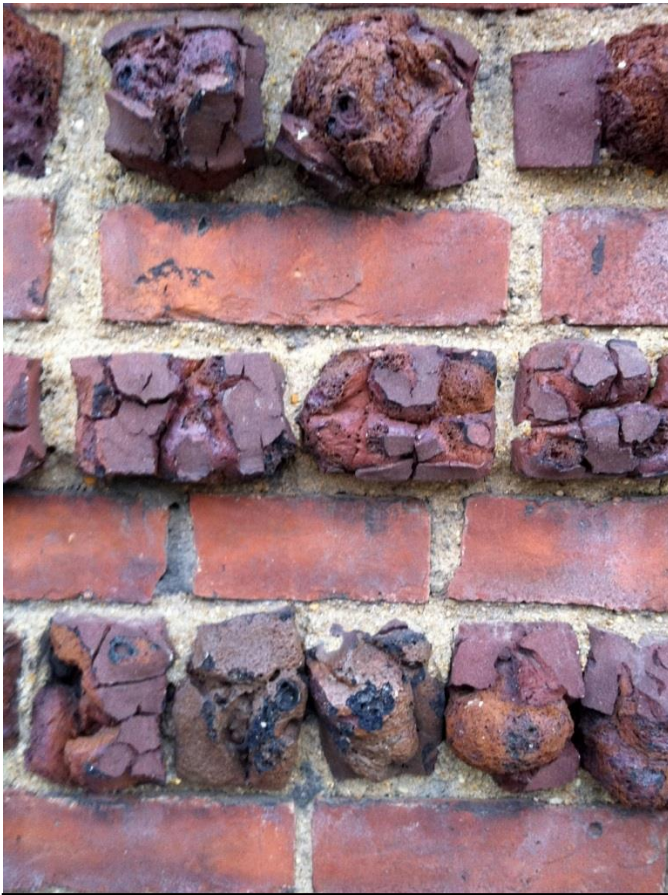


Image 1-1: Clinker Bricks from 2-4 Main Street, Roslyn, NY
Credit: Sarah Akhtar

As time progressed the definition of clinker brick further evolved. A historian of clay products, Charles Thomas Davis described the brick as “ruptured” in his 1895 book *Manufacture of Brick, Tiles, and Terra Cotta* and by 1912, the famous geologist Heinrich Ries called the brick “roughened, discolored, and distorted,” which is the closest definition to its current form (image 1-1).⁸ Davis and Ries’ description of clinker brick reflects the material in its most extreme state. However, other variants of clinker brick occur where the material is over-burnt, with cracking, variegated colors, and less distortion, an example of this is what eventually became known as *Harvard Brick* in the early twentieth century.⁹

⁶ *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge*. Vol. 5. London: William Jackson Tower Press, 1836. 409.; Ten shillings a load for clinker brick was a very cheap price. *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge* mentions that the best brick were sold for one pound ten shillings to two pounds for a thousand brick, and inferior soft brick were sold for one pound to about one pound ten shillings.

⁷ Ibid.

⁸ Charles Thomas Davis. *Practical Treatise on the Manufacture of Brick, Tiles, and Terra-Cotta*. Philadelphia: H.C. Baird and Company, 1895. 330.; Heinrich Ries. *Stones and Clay Products*. New York: John Wiley and Sons, 1912. 283.

⁹ *Sweet's Indexed Catalogue of Building Construction*. 1911. 132.

A Regional Name for Clinker Brick

Historically, “lammies” have been used as another name for clinker brick (image 1-2). This is seen regionally, in the Hudson River Valley where author Daniel de Noyelles, a historian of the Hudson River Valley brick industry described “lammies” as: twisted and distorted due to excessive heating.¹⁰ In a similar vein the name was used in a 1902 article titled “Brick and Bricklaying” where “lammies” were portrayed as: “crooked, twisted and misshapen things which are not fit for the commonest speculative tenement house...”¹¹ Despite these few instances, most texts describe “lammies” as swollen brick with bulged



Image 1-2: A gate post detail of “lammies”
Credit: Brick and Clay Record March 23, 1920

sides.¹² Their similarity to clinker brick is that both are irregular shaped brick resulting from a firing process. However, clinker brick tend to possess a more exaggerated surface with bubbles and craters juxtaposed against one another combined with variegated colors.

1.2 Historic Use of Clinker Brick

Historically, clinker brick have always been regarded as defective. They were often sold for nonstructural purposes such as artificial rock-work within gardens, or used as grog. The term grog implies broken and ground waste product that was rejected during the course of manufacturing due to structural defects such as cracking, giving the brick poor tensile strength (despite having high compressive strength from its vitrified state).¹³ Once crushed, the clinker brick pieces were used in a new batch of raw clay to produce brick.¹⁴ Up to sixty percent of grog was used in any batch of clay made for brick production.¹⁵

¹⁰ Daniel De Noyelles. *Within These Gates*. New York: D. Noyelles, 1982. 28.

¹¹ Owen B. Maginnis. "Brick and Bricklaying." *The Clay Workers*. 37-38. no. 1 (1902): 332-333.

¹² *Official Report: Fourth Annual Convention of The National Brick Manufacturers' Association*. 4-7. (1889): 19.

¹³ Donald M. Liddell. *Handbook of Chemical Engineering: Prepared By A Staff Of Specialists First Edition*. New York: McGraw-Hill Book Company, Inc., 1922. 502.; Edward Dobson, Adam Hammond, and F. Walker. *The Practical Brick and Tile Book*.

Clinker brick was often ideal as grog due to its non-porous vitrified state. When mixed into a clay body, the coarse texture of the brick allowed for raw clay to release gasses and air trapped between the particles. Additionally, it provided a rough surface area for clay to stick on and form around, creating a closer bond and as a result a denser, stronger fired product with little shrinkage and cracking.¹⁶

1.3 How Clinker Brick Were Formed

Prior to the mid-twentieth century, the production of brick faced a high level of variability in appearance, shape, and mechanical features. Often, the lack of uniformity of the material, specifically in clinker brick, was caused by the firing process within a kiln. Due to the extreme inconsistencies that occurred, manufacturers had between four and five different grades of brick. They ranged from: best, first class, second class, third class, and clinkers.¹⁷

Clinker brick, also historically referred to as “arch” brick, were often found on the walls and arches of temporary kilns (such as updraft and scove kilns) where the heat source was channeled through. They obtained the name “arch” brick because once unbaked brick were completely dry, they were stacked up in sections called “arches.” These were about five brick wide, thirty to forty brick long, and about thirty-five to fifty courses high. Each section had an “eye” where the flame for burning was located. During the firing process, the kiln was subjected to an initial moderate heat. Once all the moisture was released from the brick, the heat slowly increased until the “arch” brick located near the “eye” obtained an intense white heat. This temperature was maintained until the burning process was completed. Openings were then closed and the brick were slowly cooled.¹⁸ The process resulted in brick located on the walls

London: Crosby Lockwood and Co., 1886.156.; J.W. McBurney "The Compressive and Transverse Strength of Brick." *Bureau of Standards Journal of Research*. 2. (1929). 825-828.; C.H. Smith "Lithology or Observations on Stone for Building." *The Surveyor, Engineer, and Architect*. (1841): 16.

¹⁴ Fatih Bektas. "Use of Ground Clay Brick as a Supplementary Cementitious Material in Concrete Hydration Characteristics, Mechanical Properties, and ASR Durability." *Iowa State University College of Engineering: Dissertation*. (2007).

¹⁵ Davis, 281.

¹⁶ Bektas.

¹⁷ J. Keele. "Brickwork Masonry." *Applied Science*. 2. no. 2 (1908): 69-78.

¹⁸ Ira Osborn Baker. *A Treatise on Masonry Construction*. New York: John Wiley and Sons, 1909. 36.

adjacent to the heat source to be mostly vitrified and physically twisted, cracked, or even fused together.¹⁹

These were commonly referred to clinker or arch brick.

Colors of clinker brick were as unpredictable as their physical features, dependent on the level of heat and oxygen exposure during firing. As the temperature rose higher in the kiln, iron oxides within the clay underwent severe reactions causing drastic color variations from brick to brick.²⁰ Therefore, the uneven heat of the stationary kilns such as updraft, scove, downdraft and beehive, produced the unpredictable hues found on clinker brick. These kilns were known as stationary kilns since brick remained in one position during the entire burning cycle.²¹

Updraft Kilns



Image 1-3: Updraft Kiln
Credit: Robert Compton

Updraft kilns were used as early as ancient Greece. In the United States, the kilns were extensively employed in the 1700s, producing forty to fifty thousand brick during each firing. Updraft kilns consisted of three basic components: the firebox, which contained the flame, the damper at the top of the structure, which controlled the ventilation within the system, and the stack area that held the brick (image 1-3).²²

The kiln was a temporary structure, favored for its ability to be easily dismantled post burning. It was typically constructed of raw brick that were baked during the firing process. The brick were placed in mounds and stacked

¹⁹ McBurney, 825.

²⁰ James L. Garvin. "Small-Scale Brickmaking in New Hampshire." *The Journal of the Society for Industrial Archeology*. 20. no. 1/2 IA IN NEW HAMPSHIRE (1994): 26.

²¹ Justin Boggs, Nicole Cooper, and Debra F. Laefer. "Engineering Properties of Historic Brick: Variability Considerations as a Function of Stationary versus Non-stationary Kiln Types." *Journal of the American Institute of Conservation*. 43. no. 3 (2004): 260.

²² Beth Peterson. About.com, "What Kind of Kiln Is It?" <http://pottery.about.com/od/potterykilns/tp/typkilncons.htm> (accessed February 8, 2013).

strategically to allow heat to access different sections of the structure. The flame in the kiln was located at the base or below floor level, and hot air was released from the top through a chimney. Due to the inconsistency of heat and immobility of brick, the brick stacked closest to the firebox often received the most heat, resulting in the unwanted formation of warped, cracked, and sometimes exploded clinker brick.²³ Updraft kilns remained employed for about two centuries in the United States. However, their inefficient use of fuel and advancements in brick production resulted in their decline by the early 1900s.²⁴

Scove Kilns

Scove kiln, a type of updraft kiln, was one of the first types of ovens used to burn brick but became obsolete around the same period as the updraft kilns. This was due to its varied consistency of brick production and inefficient use of fuel (image 1-4).²⁵



Image 1-4: Scove Kiln, located in Madagascar
Credit: <http://www.nzdl.org>

During a single firing, the scove kiln was able to produce about eighty to four hundred thousand brick.²⁶ Within these temporary structures, unburned brick were stacked in piles, creating the appearance of a long rectangle with slightly slanted sides. Air spaces were left between individual brick to allow heat to reach all surfaces. Once the structure was constructed it was plastered with mortar to lock in the heat during the burning process. Openings were left at the bottom of the kiln for a static heat source that provided high temperatures for up to a week to the stationary brick. After the firing was completed, the

²³ Boggs, Cooper, and Laefer. 261.

²⁴ Ibid.

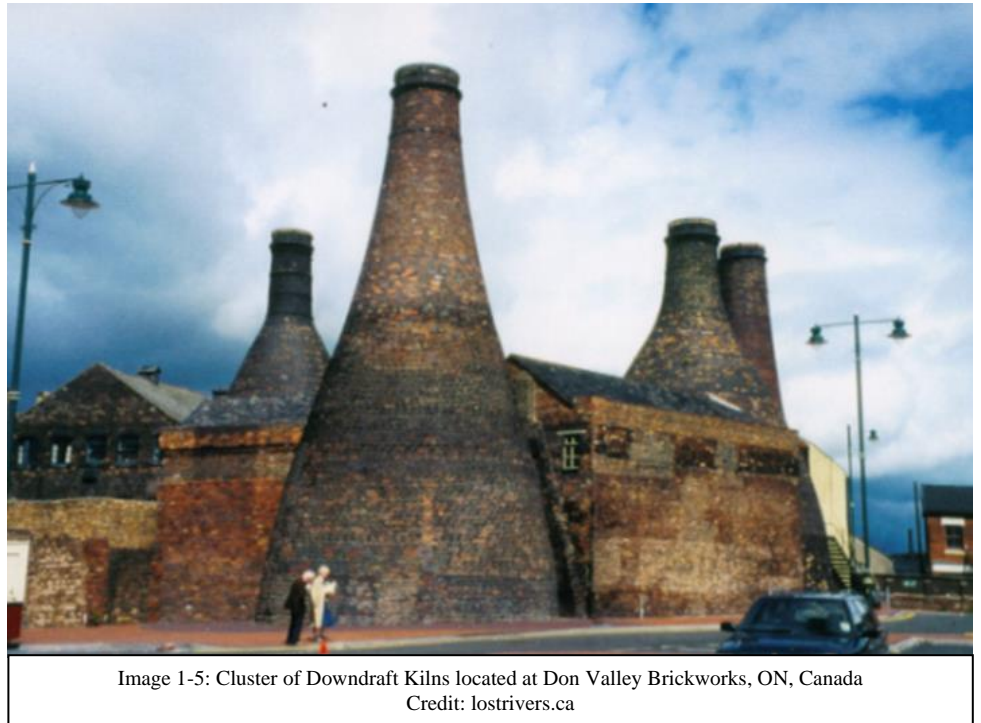
²⁵ Richard T. Kreh. *Masonry Skills*. Clifton Park: Delmar Learning, 2003. 29.

²⁶ T. Ritchie. "A History of the Tunnel Kiln and Other Kilns for Burning Brick." *Bulletin of the Association of Preservation Technology*. 12. no. 3 (1980): 47.

openings were sealed in order to prevent the accumulated heat from escaping, forcing it to slowly release through small ventilation slits at the top of the structure.²⁷ As a result of inconsistent heat, the brick furthest away from the heat source were weak and under baked, and those stacked closest to the fire formed into sintered and warped clinker brick, products of no value to the early brick maker.²⁸

Downdraft Kilns

One of the earliest uses of the downdraft kiln was witnessed in ancient China.²⁹ A downdraft kiln was a permanently built structure designed to circulate the heat source and air within the kiln. It had four key parts: the firebox, located at the front or on the side of the kiln



containing the flame, a chimney for air flow, a stackbox to hold the brick, and the damper.³⁰ In a typical firing, the downdraft kiln was able to produce about fifty to sixty thousand brick (image 1-5).³¹

The flame on a downdraft kiln, located at the bottom of the structure provided heat that naturally travelled in an upward direction. Because the chimney was an external fixture on the side of the kiln, instead of the burning process being one directional (where heat was released from regions directly above the flame source), hot air was forced to flow down, exiting through a flue and chimney. This process baked all of the brick in a more consistent manner. However, because the flame and brick continued to be

²⁷ Boggs, Cooper, and Laefer. 261.

²⁸ Kreh. 29.

²⁹ Glendale Community College, "Ceramic Handbuilding: Kilns- History and Basic Designs." <http://seco.glendale.edu/ceramics/kilns191.html>. (accessed May 9, 2013).

³⁰ Peterson.

³¹ Boggs, Cooper, and Laefer. 262.

stationary, a high level of uniformity within the heat distribution was still not obtained in the process, resulting in brick closer to the heat to deform creating unwanted clinker brick.³² The popularity of downdraft kilns fluctuated and eventually declined in the early to mid-twentieth century due to its inefficient use of fuel and as more efficient non-stationary kilns such as the tunnel kiln emerged.³³

Beehive Kilns

The beehive kiln, a type of downdraft kiln, was a round brick structure used since the seventeenth century. Unburned brick were stacked within the permanent structure, with narrow spaces between them so that heat could pass completely around each brick. Using previously burned brick and mortar to create a wall at the entryway, the kiln was



Image 1-6: 1923 Photo of Beehive Kilns, located at United Clay, Washington D.C.
Credit: Haer Archives

sealed and the heat source was introduced through side openings at specific points around the kiln. The hot air produced was released through the chimney and the kiln was ventilated through a central ceiling vent. A complete firing cycle required one week to burn brick, resulting in thirteen to forty thousand brick per session (image 1-6).³⁴ Similar to general downdraft kilns, imperfect clinker brick were also produced in beehive kilns, the brick located closest to the walls adjacent to the heat source were over burned and

³² Ibid.

³³ *American Ceramic Society Bulletin*. No. 5-12 (1990):811.

³⁴ Kreh. 29.

deformed. Due to their inability to convert from coal consumption to a more environmentally friendly option, many beehive kilns were closed by the 1960s in the United States.³⁵

³⁵ Boggs, Cooper, and Laefer. 264.

Chapter 2

The Transition of Clinker Brick From Disposable to Manufactured

2.1 The Rise of The Clinker Brick

In the late nineteenth and early twentieth centuries the production of brick increased through the use of non-stationary tunnel kilns. In this process, the brick travelled around the heat source, providing even heat to all surfaces of the brick. Accidental firing of clinker brick became less frequent and brick formation turned into a more uniform process.¹ As this transition developed on the manufacturing side, an aesthetic shift occurred in which architects believed that utilizing the warped features of clinker brick could impart a more natural and historic look to a structure. Hence, the demand of clinker brick ironically increased and a product that manufacturers could have easily reduced through efficient production, needed to be consciously made.

A rare early use of clinker brick for architectural purposes can be traced within the United States to as early as 1730, on the Jan Van Hoesen House, located in Claverack, New York (image 2-1). Large visible family initials “T”, “I”, “V”, and “H” are rendered into the structure, in dark clinker brick (image 2-2). The house is said to be the only known surviving example of this type of monogramming in masonry, which was done, within the region, between 1715 and 1750.² Despite this unique and early use of clinker brick, the material was mostly regarded as a waste product until the end of the nineteenth century.



Image 2-1: Jan van Hoesen House, Claverack, New York
Credit: Rick Allen



Image 2-2: Detail of clinker brick on Jan van Hoesen House
Credit: Rick Allen

¹ Justin Boggs, Nicole Cooper, and Debra F. Laefer. "Engineering Properties of Historic Brick: Variability Considerations as a Function of Stationary versus Non-stationary Kiln Types." *Journal of the American Institute of Conservation*. 43. no. 3 (2004): 260.

² Bob Gardinier. Van Hoesen House Historical Foundation, "A Dutch Past Worth Preserving."
<http://www.vanhoesenhhouse.org/html/articles/about_1_aDutchPast.html> (Accessed February 10, 2013).

The earliest transition of clinker brick from disposable to purposefully used for architectural detailing was witnessed in regions west of the Mississippi, primarily in California. The Weltevreden also known as the Volney D. Moody House in Berkeley, California, was designed in 1896 by Albert C. Schweinfurth (image 2-3).³ The *Architectural Review* stated in an article: “rarely does nature seem to welcome a work of architecture as she does this.” In discussing the material choice, the article said: “The walls are built of dark red, or rich brownish ‘clinker brick’... before being used by Mr. Schweinfurth for this work were looked upon as inferior or refuse brick, but which have since gained much popularity.”⁴

Around the same year as the Volney D. Moody House, the San Francisco based architect Willis Polk used clinker brick juxtaposed with a sandstone trim to create a dynamic surface, at the William Bourn House (1895-1896) (image 2-4). At the time the house was built, clinker brick were still a cheap material. Polk employed the brick on all four exterior elevations deeming its aesthetic qualities as one that provided a picturesque feeling.⁵ His inspiration for using the roughened brick may have been derived from English medieval, vernacular houses that he was familiar with, such as the Eastgate House in Kent.⁶ In the same period, Ernest Coxhead, another California based architect, created the Edwin Tobias Earl House (1895-1898) in Los Angeles. The rustic cottage had a steep roof with large dormers and a textured exterior created entirely in clinker brick.⁷

³ Harvey Helfland. *The Campus Guides: University of California Berkeley*. New York: Princeton Architectural Press, 2002. 92-93.

⁴ "Houses: Berkeley California." *The Architectural Review*. 9. No. March (1902). 76-77.

⁵ Richard W. Longstreth. *On The Edge of The World: Four Architects In San Francisco At The Turn Of The Century*. Berkeley: University of California Press, 1983. 211-212.

⁶ Ibid.

⁷ Ibid., 206-209.; Daniella Thompson. "East Bay Then And Now: Allenoke Manor Was A Scene Of Hospitality For 5 Decades." *The Berkeley Daily Planet*, Home and Garden edition March 21, 2008.; The house was demolished in 1957.



Image 2-3: Weltevreden
Credit: Architectural Review, Vol.9 March 1902



Image 2-4: Bourn House, San Francisco, CA
Credit: www.noehill.com/sf/landmarks/sf038.asp

As the popularity of clinker brick continued to increase in the western part of the United States, mention of the material's use appeared in magazines and newspapers. In 1901, the *Cedar Rapids Daily Republican* of Iowa mentioned the use of the brick for fireplaces.⁸ That same year, *House Beautiful* magazine, an Arts and Crafts Movement magazine discussed the use of clinker brick on a fireplace in an English style cottages located in California.⁹ In a 1904 article featured in the *Berkeley Daily Gazette* readers were told that the brick could be found on houses within the California city, and in a 1907 *Oakland Tribune* article the aesthetic contributions of the material were described as: "rough clinker brick in the foundation adds greatly to the rustic beauty of the exterior."¹⁰ By 1912, though clinker brick had become a desired material throughout the country, people were still reminded of its use on the west coast. Heinrich Ries stated: "In a large city of the Pacific Coast, dozens of exterior chimneys on private dwellings are constructed of the warped, partly fused, over burned product... If these had not caught the fancy of the architect they would be a loss to the manufacturer."¹¹

Though its initial implementation began in California, during the span of clinker brick popularity it was primarily used in Arts and Crafts and Tudor Revival style architecture across the country. The use was promoted within the two movements, for its irregular textures, multicolored surface and ability to add instant age and rustication to a structure. These facets helped to maintain the popularity clinker brick for about forty years.

Several years after its introduction into the decorative markets and it spread nationally, clinker brick continued to be expressed in a positive light. An article in *The Daily Courier* of Connellsville, Pennsylvania from 1927 explained: "...clinker, was a total loss to the manufacturer and usually was chucked into the rubbish heap or the dump. Today clinker brick are used in the construction of the most attractive brick houses..." That same year the material's appeal was poetically described in an edition of *Garden and Home Builder* as:

⁸ "Robert L. Stevenson: Beautiful Home In San Francisco His Widow Has Built." *Cedar Rapids Daily Republican*, Sunday Morning edition May 12, 1901.

⁹ Olive Percival. "The Down-Hyl Claim." *House Beautiful*. 9-10. (1901): 154.

¹⁰ "Work of Club Is Praised." *Berkeley Daily Gazette*, October 21, 1904.; "Comfort and Elegance Combined in a Cozy Home at Comparatively Small Cost." *Oakland Tribune*, Saturday Evening edition. June 29, 1907.

¹¹ Heinrich Ries. *Stones and Clay Products*. New York: John Wiley and Sons, 1912. 283.

These warped, broken discards have become the aristocrats of all brick. And why? Because they are the product of the fire, of that purgatory which burns out the baser qualities yet refines and ennobles, but in passing it leaves its mark. These brick remind one of the wrinkled visage of age wherein is recorded much suffering. These brick are not pretty--they are beautiful, and in that deep true sense of beauty as appreciated by the artist. They have character; they tell a story-- the story of the fire. As there is more genuine beauty in the wrinkled visage of age than in the pretty symmetry of youth, so also do these warped and twisted brick surpass their precise neighbors.¹²

America's movement towards the adoption of clinker brick as decorative elements was seen through the use of the material within architecture and through its increased mention in various publications in the early twentieth century. As a result of the growing fondness for the formerly worthless brick, brick makers responded by devising ways to specifically manufacture and advertise them to feed into the demand.

2.2 Purposeful Manufacturing of Clinker Brick

Historically, clinker brick were often described as a type of common brick because of their surface imperfections and low cost.¹³ But over time, the irregular and "bizarre," yet attractive surfaces of the brick were viewed as "flexible," manipulated for many uses by architects and builders.¹⁴ Referred to as "our grandfathers' favorites," clinker brick seemed to evoke a memory of when brick were hand crafted and irregular.¹⁵ Interestingly, the period Americans were reminiscing of was an era when historically masons strived to create perfect brick and discarded the distorted ones like clinker brick. However, unlike the perfected surfaces of the uniform brick derived from the modern non-stationary kilns, clinker brick were able to create visual interest through their exaggerated shapes and deep hues allowing for variety in architecture. The brick also helped to give the building an *appearance* of age. Therefore, as clinker brick took a popular hold within the architectural realm, brick manufacturers were driven to meet the demands by learning how to purposefully produce them.

¹² J. Duncan Hunter. "Brick as a Fireproof Material." *Garden and Home Builder*, January 1927, 386-387.

¹³ Ronald Brunskill and Alec Clifton-Taylor. *Brickwork*. New York: Van Nostrand Reinhold Company, 1977. 77

¹⁴ *The Heart of The Home: Fireplace Designs and How to Build Them*. Cleveland: The Common Brick Manufacturers' Association of America, 1927. 5.

¹⁵ "Brickwork Tastes Revert To Types Used Years Ago: Clinker Brick Serves Double Purpose In Giving Color Effects, Appeal To Public." *The Sunday Messenger*, December 4, 1927.

One of the key characteristics of clinker brick was their irregular shape. Manufacturers created these warped masses through heating raw brick at high temperatures until they were fully sintered and deformed. Controlling the burning process helped to bring forth the array of unpredictable colors found on the brick. In order to ensure that the variations were produced, the atmosphere in the kilns during the later stages of burning were closely monitored and stopped prior to the brick fully blackening.¹⁶ As a result, in order to create the appearance of perfection for a material that was never perfect, manufacturing of clinker brick became a very controlled and time consuming procedure.

Producing a sufficient amount of clinker brick for a sale could often take up to six months.¹⁷ A *San Antonio Light* article from 1926 stated that: "The percentage in any kiln is small and they are so difficult to obtain that some manufacturers are experimenting with a view to increasing their clinker brick output."¹⁸ Though brick manufacturers hoped to find a better solution and speedier process to produce the brick they apparently never did. This was because after the heavily monitored baking process, clinker brick had to be hand sorted from the baked pile, a process still continued today.¹⁹ Therefore, the fashionable clinker brick were expensive compared to the price of common red brick.²⁰ In a city such as Los Angeles in 1915, common brick sold for \$4.50 per M (which referred to per one thousand brick), as opposed to clinker brick that sold for \$9.00 per M, a significant change for a once worthless material.²¹ Heinrich Ries described this phenomenon as:

Not a few are roughened, discolored, and distorted by over firing or other causes, and these, in the manufacturer's opinion, have usually been regarded as worthless. But it is these rejects that in many cases have appealed to the architect, and as a result of the demand for them, the "culls" have not only assumed a good market value, but in some districts the brick maker has been called upon to turn out hundreds of them. This may give them even more trouble than producing a kiln of normally burned brick, and he consequently demands a good price for them.²²

¹⁶ Alfred B Searle. "Recent Improvements in Methods of Brickmaking: Lecture III." *Royal Society for the Encouragement of Arts, Manufacturers and Commerce*. 78. no. 4058 (1930): 1045.

¹⁷ Warren Griffiss. "Beauty of Common Brick." *Brick and Clay Record*. 56. No. June 1 (1920). 1097.

¹⁸ "Clinker Brick is Attractive." *The San Antonio Light*, Part Seven, November 7, 1926.

¹⁹ Rob W Sovinski. *Brick in The Landscape: A Practical Guide to Specification and Design*. Hoboken: John Wiley and Sons, 1999. 35.; Lynda Evans. Interview on Brick Works Clinker Brick Manufacturing. Conducted by Alafia Akhtar. January 25, 2013.

²⁰ "The A.A. Moores Are Building." *Oakland Tribune*, Saturday Evening edition October 11, 1902.

²¹ "Current Prices of Building Materials." *Western Architect and Engineer*. 40-41. (1915): 131-136.

²² Ries, 283.

Despite the time consuming process and increased prices, the noticeable popularity of clinker brick could not be ignored. In order to differentiate themselves in a unique market, brick manufacturers began producing and advertising their own brands of clinker brick. The Sayre and Fisher Company, a nationally known entity based out of Sayreville, New Jersey, produced the *Taylor Brick*. It was first advertised in the 1911 Sweet's catalogue, described as: "...also for facing. Sometimes called "Clinker Brick" because they are nearest the fire in the kilns and are burned black and twisted. Very popular with some architects for residences, etc."²³ The Ada Brick Company, located in Ada, Oklahoma, featured their product in the local newspaper, *The Ada Evening News*. It stated, "The rough surface of clinker brick gives the popular soft, antique finish. Clinker brick is a sound investment, an opportunity to create beauty in your home and secure permanence..."²⁴ The material was advertised during a period when it was already being used for Arts and Crafts and Tudor Revival architecture. Both styles stressed a rustic aesthetic that was fulfilled by the "antique" finish, of clinker brick. In the western part of the country Lake Union Brick Company of Seattle Washington strategically advertised their clinker brick in a 1912 *Craftsman Bungalows: A Collection of The Latest Designs* catalogue.²⁵ The style of the houses was derived from the Arts and Crafts Movement (as implied by the "craftsman" name). Therefore, the company hoped to attract customers looking to create rustic styled bungalows encouraging them to use their product.

The "Harvard Brick" was another version of manufactured clinker brick. It originally obtained its name after being used on the gateways at the entrance of Harvard University in Cambridge, Massachusetts.²⁶ In the 1911 Sweets Catalogue, the brick was advertised by the Waldo Brothers of Boston Massachusetts as having features of a clinker brick, yet never being called a clinker brick. The company described their product as:

²³ *Sweet's Indexed Catalogue of Building Construction*. Chicago: The Architectural Record Company, 1911. 131.

²⁴ "Clinker Brick." *The Ada Evening News*, April 15, 1928.

²⁵ "Industrial News: Clay Products." *Municipal Journal*. 36. No. 8 (1914). 260.; Jud Yoho. *Craftsman Bungalows: A Collection of The Latest Designs*. Seattle: Craftsman Bungalow Company, 1912.

²⁶ "Boston Getting Brick-Wise." *The Ohio Architect, Engineer and Builder*. 24. no. 2 (1914): 36.

Being practically a handmade article they have a somewhat irregular shape and a lack of exactness that is very please. The texture is rough without being unnaturally so. The color is varied in each individual brick from bronze and green and dark blue on the edges to a good cherry red in the center. They are tough and will stand in any climate without deterioration. They are impervious and therefore can be used on walls that will be exposed to driving storms.²⁷

Harvard brick sometimes resulted because of their use as arch brick, similar to how clinker brick were sometimes formed.²⁸ Therefore, “Harvard Brick” seem to simply be a *special* and less extreme version of the clinker brick.

In addition, as the rise of clinker brick was frequently attributed to its ability to resemble a rustic historic aesthetic, the “Harvard Brick” did the same. In a 1914 article titled “Boston Getting Brick-Wise” the brick were described as an “antique bricks the appearance of belonging to a by-gone period.” Having been used on recently constructed Harvard dormitories it was stated that the brick helped to “illustrate a pleasing combination of Harvard and antique brickwork which stamps them as fitting additions to an institution founded nearly 300 years ago.”²⁹

Apart from brick manufacturers producing clinker brick, *Brick for the Average Man's Home*, a catalogue containing house models and plans, released by the Common Brick Manufacturers' Association of America, supported the use of clinker brick. In the Yosemite a house based on popular California residences, clinker brick was featured on the facade.³⁰ By advertising the aesthetic and material benefits of clinker brick, manufacturers hoped to reap the benefits of a growing phenomenon for a product they had considered waste, but architects now valued.

2.3 Installation of Clinker Brick

Clinker brick were used on fireplaces, garden walls, columns, and chimneys, as well as for overall facades of houses. Since the brick were heavily distorted, they were often installed using very

²⁷ *Sweet's Indexed Catalogue of Building Construction*. 1911. 132.

²⁸ Ibid.

²⁹ “Boston Getting Brick-Wise” 36.

³⁰ *Brick for the Average Man's Home*. Cleveland: The Common Brick Manufacturers' Association of America, 1920.

wide mortar joints that would help to maintain level courses.³¹ The brick lent themselves to various bonds that helped enhance not only their character, but also the structure they were used on.

The brick were frequently positioned in assorted ways in order to enhance the aesthetics of a structure. For example, clinker brick headers were extensively used on Flemish bonds frequently found on Tudor Revival houses. The dark brick were juxtaposed against lighter ones in order to provide color and depth to the building.³² Another unique and popularized form of installation that emerged in the early twentieth century was skintling. The term “skintled brickwork” originally referred to a method of arranging brick on an angle in kilns. The decorative use of the method was introduced in Chicago on the facades of buildings. Brick were laid rapidly on the wall, slightly angled, so that their edges jutted out, creating a visually attractive surface (images 2-5 to 2-7).³³ The method did not involve the precision required for ordinary brick laying and allowed for thick joints that had rough undercuts.³⁴ Clinker brick were used for this technique because of the material’s irregular shape “cleverly intermingled in the skintled brick wall, add[ed] to the textural beauty [and produced] a compelling appeal.”³⁵ The unpredictable shapes of clinker brick gave architects creative freedom to create a number of varied and unique surfaces which were reminiscent of quaint picturesque cottages or the rusticated medieval structures.³⁶

³¹ Sovinski, 35

³² Myron Bement Smith. "Brick Through The Ages." *Garden and Home Builder*. XLIV. no. 5 (January 1927): 360.

³³ H.A. Simons. "Building and Equipping Your Home: Common Brick Merits Appreciation For Its Structural Qualities And Its Artistic Masonry Effects." *Arts and Decoration*, February 1930, 76.

³⁴ William Carver. *Skintled Brickwork: Brickwork Working Details*. Cleveland: The Common Brick Manufacturers' Association of America, 1920.

³⁵ "Common Brick Field Enlarged By Skintling." *The Reporter, Le Grande, Iowa*, February 28, 1930.

³⁶ Simons, 78.



Image 2-5: Skintled Brickwork; House at Glencoe, Ill. James Roy Allen, Architect
Credit: Skintled Brickwork: Brickwork Working Details The Common Brick Manufacturers' Association of America



Image 2-6: Skintled Brickwork; C.B.M.A. Effect Number Four
Credit: Skintled Brickwork: Brickwork Working Details The Common Brick Manufacturers' Association of America



Image 2-7: Skintled Brickwork; C.B.M.A. Effect Number Six
Credit: Skintled Brickwork: Brickwork Working Details The Common Brick Manufacturers' Association of America

Despite providing textured quality to a building, the use of clinker brick in skintling and other forms of bricklaying often proved troublesome. Bricklayers working with the material commonly charged a higher rate than the average industry. This was due to the longer installation times required as a result of the material's warped shape, which did not allow for easy laying and a standard application of mortar. A 1902 newspaper article speaking about the recent popularity of clinker brick stated that not only were these brick that were once used for "hauling," expensive but, "lathers at the present moment [were] getting eight dollars a day-- fifty dollars a week-- did ever you hear anything quite so absurd?"³⁷ The author's surprise at the bricklayer's daily rate illustrated how expensive utilizing clinker brick may have been, especially since an average bricklayer in 1902 earned about \$7.00 a day.³⁸ The expense of installation only grew further. By 1927, *The Garden and Home Builder* explained in reference to clinker brick that "the antiqued brickwork requires much more time for building, and time is the important thing in brick building when bricklayers receive fourteen dollars a day."³⁹ This was compared to the average rate of about \$9.13 bricklayers were making in the 1920s and the average rate of \$12.28 they were making in the 1930s.⁴⁰ The wage difference between a general bricklayer and one working with clinker brick displayed both customer willingness and a bricklayers requirement to achieve the aesthetic qualities imparted by the brick.

The long manufacturing and laying processes did not stunt the popularity of clinker brick, which lasted about forty years. This was initially due to the rise of the Arts and Crafts Movement and the use of clinker brick on its various craftsman homes helping to catapult the material from disposable to manufactured.

³⁷ "The A.A. Moores Are Building." *Oakland Tribune*, Saturday Evening edition October 11, 1902.; A lather is a workman, someone who performs manual labor as per the Farlex Dictionary. In reference to this article, the author was referring to bricklayers.

³⁸ *Bulletin of The Department of Labor*. Washington D.C.: Government Printing Office, 1903. "Occupations, Average Wages, Etc." 875.

³⁹ Smith, 361.

⁴⁰ *Handbook of Labor Statistics 1947 Edition Bulletin No. 916*. Washington D.C.: U.S. Government Printing Office, 1947. "Table C-9: Union Hourly Wage Rates In Selected Building Construction Trades In 37 Cities, Selected Years, 1910-47." 101

Chapter 3

The Hand of The Arts and Crafts Movement in The Rise of Clinker Brick

3.1 The Origins of The Arts and Crafts Movement

The transition of clinker brick to a decorative material in the late nineteenth and early twentieth centuries can be attributed to the changing tastes of architects and their clients. The trend initially began in California however it was first popularized nationally and recognized for mainstream use by the philosophies and literature of the Arts and Crafts Movement.

The movement originated in the British Isles and eventually spread throughout the United States. It evolved out of the Gothic Revival period that emphasized an interest in craft technique and rustic details within medieval style architecture.¹ The Arts and Crafts Movement began in 1860 in England, led by the artist and writer William Morris (1834–1896). Morris' ideologies and aesthetic beliefs were heavily influenced by the writings and philosophies of designer, critic, and Gothic Revival architect Augustus Welby Pugin (1812–1852) and art critic John Ruskin (1819–1900).²

The Influence of Augustus Welby Pugin

Augustus Welby Pugin's philosophies on rustic architecture and the incorporation of natural materials were influential on the Arts and Crafts Movement. They impacted its choice of design and use of materials such as clinker brick which were prime examples of a naturally found material. In the book, *The True Principles of Pointed or Christian Architecture*, Pugin described the two absolutes of design as: "1st, that there should be no features about a building which are not necessary for convenience, construction or propriety; 2nd, that all ornament should consist of the essential construction of the building."³ As his advice to architects, he further stated:

An architect should exhibit his skill by turning the difficulties which occur raising an elevation from a convenient plan into many picturesque beauties; and this constitutes great difference between the principles of classic pointed domestic architecture. In the former he would be compelled to devise expedients to conceal the irregularities; in the latter he has only to beautify them.⁴

¹ Wendy Kaplan. *The Arts and Crafts Movement in Europe and America: In Europe and America: Design for the Modern World*. Los Angeles: Thames and Hudson, 2004. 21-23.

² Peter Davey. *Architecture of The Arts and Crafts Movement*. New York: Rizzoli, 1980. 24

³ A. Welby Pugin. *The True Principles Of Pointed or Christian Architecture: Set Forth In Two Lectures Delivered At St. Marie's Oscott*. London: Henry G. Bohn, 1853. 1.

⁴ Ibid., 52.

An architect of Pugin's mold stressed deriving ornamentation from a material's natural features. He encouraged embracing the irregularities of materials found in nature, which produced architecture that embodied a rustic and romantic quality. These key ideas were utilized within Pugin's work and Gothic Revival architecture, and eventually drove many of the aesthetic values embedded in the Arts and Crafts Movement.⁵

The Influence of John Ruskin

The ideas of John Ruskin, a contemporary of Morris, also influenced the Arts and Crafts Movement. Like Pugin, Ruskin was a promoter of Gothic style architecture. He believed that the style evolved from Northern Europe, being built by the hands of local craftsmen, and having a moral purpose by teaching craftsman the ideas of honesty and hard work. Ruskin discussed in a chapter titled "Naturalism" in his book, *The Stones of Venice* that an artist should not be constrained to laws of architecture but should be able to create as he chooses using natural materials around him.⁶ His emphasis on naturalism and crafts embodying the hands of its maker was a response to an increasingly industrialized England.

The use of machines created efficient generic products that lacked character. Ruskin preached, that machinery should be used limitedly and only if it did not imitate artisan handwork.⁷ This belief coupled with the love for simplicity and natural beauty resonated within the Arts and Crafts Movement. The concept became a part of its core philosophies in which locally found or formed materials such as wood, stone, and brick, especially clinker brick (as used in America), were installed as unaltered pieces allowing for their natural characteristics to illustrate the beauty of the building.

The Emergence of The Arts and Crafts Movement

William Morris, an artist, craftsman, and social reformer was an avid follower of Augustus Pugin and John Ruskin and the founder of the English Arts and Crafts Movement. Morris, like Ruskin was bothered by the mass production and mechanization of artistic commodities as well as the primary focus

⁵ Davey, 12.

⁶ John Ruskin. *The Stones of Venice, Volumes 1-2*. New York: John B. Alden Publishers, 1885. 181.

⁷ Davey, 14.

on commercialism versus art in England.⁸ The seemingly beneficial advancement of machines created goods of poor design and quality, fading out the art of craftsmanship. In addition, the ornate and ostentatious tastes of the Victorian era (popular at the time) catered to the wealthy, neglecting the lower classes and most importantly the simplicity and charming presence of natural beauty.⁹

The Arts and Crafts Movement evolved out of these societal and philosophical changes. It promoted a shift back towards artisanship, which produced quality products and an appreciation for the simple and organic. A good design to Morris was linked to a good society. The idea revolved around an environment where the worker was not brutalized by his working conditions, and instead took pride in his craftsmanship and skill. He believed, “art is the expression of man’s pleasure in labour.”¹⁰ Hence, Morris encouraged a revival of individual craftsmanship. It would provide employment for craftsmen and the workers could produce beautiful objects that enriched the lives of ordinary people.¹¹ This notion developed into a vital idea of the existence of a creative democracy. Art would be accessible to all and made “by the people, for the people.”¹²

In 1861 William Morris and a group of artist friends set up a firm of decorators called Morris, Marshall, Faulkner and Company whose primary focus was producing democratic simple art. The firm initially made mostly furniture and stained glass, often working for Gothic Revival architects. By the 1870s they began to produce textiles and wallpapers, emphasizing the virtue of handcrafted decor.¹³ Ironically, the quest for providing a democratic art was not fulfilled by Morris, since the crafts his firm produced involved time consuming processes that only the rich could afford.

Apart from his own business, which produced handmade products, Morris also encouraged the establishment of an Art Workers’ Guild, created in 1884. It included an association of painters, sculptors,

⁸ David Ross. Britain Express, "William Morris (1834-1896)." <http://www.britainexpress.com/History/morris.htm>. (accessed February 17, 2013).

⁹ Nancy E Berry. *Architectural Trim*. Gloucester: Quarry Books, 2007. 50.

¹⁰ Oscar Lovell Triggs. *Chapters in The History Of The Arts And Crafts Movement*. Chicago: The Bohemia Guild of The Industrial Art League, 1908. 59-60.

¹¹ Charlotte Jirousek. Art Design and Visual Thinking, "The Arts and Crafts Movement in Europe and America: In Europe and America: Design for the Modern World." Last modified 1995. <http://char.txa.cornell.edu/art/decart/artcraft/artcraft.htm>. (accessed February 17, 2013)

¹² Ross. "William Morris (1834-1896)."

¹³ Kaplan, 21-23.

architects, designers and craftsmen. The fundamental idea was that all members would learn from one another, meeting regularly for lectures and demonstrations. They were encouraged to share skills and ideas in order to produce products of value.¹⁴ As the movement influenced hand-made crafts, it also contributed to the philosophies of architecture. The underlying ideas drove architects to design structures that responded to their natural surroundings.

Though Morris was not an architect, he believed it was the mother of all arts and crafts. His ideal architecture was derived from nature and fulfilled the needs of ordinary people.¹⁵ Elaborate decorations were rejected for simple designs. Morris' Red House (1859) located in Bexleyheath, London and designed by architect Philip Webb, embodied the ideologies of the English Arts and Crafts style. The house had well-proportioned solid forms, wide porches, a steep roof, pointed window arches, brick fireplaces and wooden fittings. Webb's design embraced a vernacular architectural style emphasized through asymmetry. The textures of ordinary materials, such as brick, stone, wood, and tiles were exploited.¹⁶ These materials not only responded to the land around the house, but were also those used by ordinary people. However, the grandiosity of Red House did not serve as a great example of "democratic" architecture since most people were unable to afford its detail and richness.

Despite his greatest efforts to keep the idea of craftsmanship alive, William Morris found that hand-made crafts were only affordable to the very wealthy, contradicting the notion of arts "for the people by the people." As a result, there was a steep decline of the Arts and Crafts Movement within England, but the ideas of democratic design resonated with Americans and gave rise to a similar movement in the United States.

3.2 Arts and Crafts Movement in America

"Democratic design" was the term commonly used around 1900 for work associated with the Arts and Crafts Movement. It described a simple, good-quality product made available to everyone. Similar to

¹⁴ Ibid., 34.

¹⁵ Davey, 20-23.

¹⁶ Victoria and Albert Museum, "Style Guide: Arts and Crafts." Last modified 2013.
<http://www.vam.ac.uk/content/articles/s/style-guide-arts-and-crafts/> (accessed February 20, 2013)

their British counterparts, many Americans were also disenchanted with industrialization and the aesthetics of the Victorian era. They were determined to change society by transforming the work process, which would be achieved through a movement back to artisanship and hand-crafted work. Since the United States had the largest middle class in the world, it was the best environment for the “do-it-yourself” core of the Arts and Crafts Movement, allowing it to thrive.¹⁷

One of the biggest advocates for the movement in the United States was the American designer Gustav Stickley. During his 1895 trip to Europe, Stickley witnessed the products of the English Arts and Crafts movement, drawing him into the allure of democratic art and the craftsman ideal.¹⁸ He applied the philosophies to his furniture business and emulated Morris's company in using artisans. Stickley felt that mass-produced furniture was poorly constructed and complicated in design. He set out to improve the tastes of Americans through "craftsman" furniture that revolved around honest construction, simple lines, and quality material.¹⁹

Stickley was however, first and foremost a business man. Therefore, he managed to mass-produce his work, selling it to a wider cliental. Though this was contradictory to one of the main philosophies of the Arts and Crafts Movement which revolted against mass-production, the *appearance* of his work as being hand-crafted allowed for it to flourish. This was compared to Morris, whose attention to detail and emphasis on individually hand-crafted items resulted in expensive products limiting their accessibility. Unlike Morris, Stickley was able to advance his business and disseminate the philosophies of the Arts and Crafts to a middle class audience he did this especially through his magazine *The Craftsman*, which became a guide for the movement.²⁰

Launched in 1901, *The Craftsman* covered a wide range of topics from crafts, literature, music, architecture, city planning, social conditions and progressive political issues.²¹ The magazine also urged a

¹⁷ Kaplan, 247-248.

¹⁸ Coy L. Ludwig. *Arts and Crafts Movement in New York State 1890-1920s*. Layton: Gallery Association of New York State, 1983. 62-63.

¹⁹ Monica Obniski. Helburn Time Line of Art History: Metropolitan Museum of Art, "The Arts and Crafts Movement In America." Last modified 2012. http://www.metmuseum.org/toah/hd/acam/hd_acam.htm (accessed February 22, 2013).

²⁰ Ray Stubblebine. *Stickley's Craftsman Homes*. Salt Lake City: Gibbs Smith, 2006. 9.

²¹ Mary Ann Smith. *Gustav Stickley: The Craftsman*. Toronto: General Publishing Company, 1983. 33-35.

do-it-yourself mentality through the publishing of plans of craftsman furniture designs. Stickley encouraged readers to find pleasure in manual tasks like gardening and the creation of their own crafts, highlighting the appeal of nature and personal creativity.²²

Hand-crafted furniture and design was not Stickley's sole passion. He also had a keen interest in architecture and believed that a house could embody the ideals of the Arts and Crafts Movement through construction and decor.²³ The style of a home was synonymous with locality, and an expression of local traditions, necessities, climate, and landscape.²⁴ In 1902 he began publishing house designs (for purchase) in *The Craftsman* by various architects whom he employed, including Harvey Ellis.²⁵ A question and answer section was also incorporated for readers on Arts and Crafts style architecture. By the time *The Craftsman* was discontinued in 1916, more than two hundred different home plans were available to subscribers varying in size and price, helping to create a wider reach of the craftsman home.²⁶ In addition to providing plans, the "Architectural Department" of *The Craftsman* also provided services to help modify existing designs or create new houses on commission.

Homes designed for the magazine represented various vernacular styles found throughout the United States, such as: farmhouses, four-squares, town houses, cottages, and bungalows.²⁷ All of Stickley's houses featured open floor plans to create airy spaces that engaged with the outside environment. Grouped windows were also present in designs, providing ample light and views. Simple moldings, stained wood, built-in cabinets and fireplaces were created. Stickley encouraged built in benches, bookcases and sideboards to create a practical house, not being entirely reliant on moveable furniture to make it useful and appealing. Though many of these houses were not innovative works in progressive styles (apart from the bungalow), their designs reflected a simplified "form following

²² Ray Stubblebine. The Stickley Museum at Craftsman Farms, "Gustav Stickley." Last modified 2013. <http://stickleymuseum.org/learn-more/gustav-stickley.html> (accessed February 18, 2013).

²³ Stubblebine. *Stickley's Craftsman Homes*. 5-6.

²⁴ Franklin J Hunt. "The Country House and Its Style." *The Craftsman: Gustav Stickley United Crafts*. 3. October 1902- March 1903: 282.

²⁵ Ludwig, 64.

²⁶ James C Massey., and Shirley Maxwell. "Arts and Crafts Houses." *The Old House Journal*, May/June 1990, 50-51.

²⁷ Stubblebine, 9.

function” aesthetic, with the use of basic materials for walls, roofs, and surface treatments.²⁸ As per the philosophies of the Arts and Crafts Movement, various natural and organic materials were used to create the elements of the home. These involved the use of wood shingled walls, wooden rafters, stone, cement, rough-textured, flat-tiles, slate roofs, and multi-colored highly textured brick like clinker brick.²⁹

3.3 Use of Clinker Brick in Arts and Crafts Architecture

Materials were an important facet in creating the complete Arts and Crafts home. They often helped to produce distinctive looks and reflected the local environment. The irregular and unique ways in which natural unaltered materials were used made the architect a craftsman and the house his craft.³⁰ The use of clinker brick represented these ideals yet also proved to be a philosophical contradiction, undermining the core beliefs of regarding an anti-industrialism and anti-mass production sentiment. Clinker brick was a material that craftsman (brick masons) historically rejected as being too imperfect, though as the material became used decoratively and rose in popularity, it evolved into a mass-produced commodity. The manufacturing of clinker brick was heavily monitored to achieve its physical qualities, defeating the purpose of its use as a naturally forming product. Finally, as a result of its high prices, the brick was not entirely accessible to the ordinary person, a characteristic at odds with the notion of “democratic art.” Despite these factors, clinker brick was highly popular during the Arts and Crafts movement. One reason was for its *appearance* as a “naturally” formed material and the other for its aesthetics, illustrated through the brick’s exaggerated features that represented textures found in nature. These facets helped to create a rustic structure with visual appeal.

Clinker brick were ironically, described as “ordinary” by Stickley who claimed the irregular surfaces were afforded by their joints.³¹ The blistered, exploded textures of the brick were frequent decorative highlights of many of the craftsman homes. Similarly, were exploited for their physical

²⁸ Ludwig, 66.

²⁹ Duchscherer, 43.

³⁰ Stuart Stark. Historic Media, "Clinker Brick and Arts and Crafts Houses." Last modified 2007-2008.

<<http://classicbungalows.com/2007/10/16/clinker-brick-and-arts-crafts-houses/>> (accessed October 8, 2012).

³¹ Gustav Stickley. *Craftsman Houses The 1913 Catalog*. Mineola: Dover Publications, Inc., 2009. 22, 42.

features by Arts and Crafts architects such as Greene and Greene who employed the material as their primary choice on large scale bungalows, elevating the status of clinker on a pedestal.

Throughout their existence during the Arts and Crafts Movement, magazines such as *The Craftsman* and *House Beautiful* (1896-present) advertised clinker brick for use on exterior architectural features such as: facades, chimneys, foundations and columns, and interior elements such as the fireplace within the craftsman home. As early as 1901, *House Beautiful* featured two articles regarding the use of clinker brick on fireplaces.³² Similarly, in a 1902-1903 edition of *The Craftsman* magazine, architect Franklin J. Hunt wrote about styles of country homes referring specifically to one built in Menlo Park, California. The house was as an ideal country home and had a fireplace with “open mouthed” clinker brick whose features most probably resembled an exploded surface.³³ A *Craftsman*’s article written by Henrietta P. Keith in 1907, discussed the effects of the material on modern domestic architecture where she said:

Hard burned clinker brick set roughly in dark mortar are used in the foundation and in the entrance pillars and chimneys, strikingly combined with large, mossy boulders brought from the near-by mountains. The warm purplish brown of the brick in combination with the mossy boulders and the soft grays and browns of the wood construction give a color effect of great beauty and softness.³⁴

By 1911 clinker brick had become widely popular, in an article titled “How The California Bungalow Illustrates The Right Use Of Building Materials” the author discussed the frequent use of clinker brick for foundations, lower walls, and chimneys, often irregularly placed. The use of the materials was often a captivating detail to the house providing “unusually rich and harmonious color effects.”³⁵

Along with various articles in *The Craftsman*, architectural plans sold to consumers within the magazine also promoted the use of clinker brick. In House No. 38 from 1906, the first story of the house contains clinker brick laid in black cement mortar (image 3-1). The material is used in combination with

³² Olive Percival. "The Down-Hyl Claim." *House Beautiful*. 9-10. (1901): 154.; J.B.W. "Questions And Answers: Decorating An Entire House." *House Beautiful*. 9-10. (1901): 123.

³³ Hunt, 285-286.

³⁴ Henrietta P. Keith. "The Trail of Japanese Influence in Our Modern Domestic Architecture." *The Craftsman: Gustav Stickley United Crafts*. 12-14. July 1907-September 1907: 451.

³⁵ Helen Lukens Gaut. "How The California Bungalow Illustrates The Right Use Of Building Materials." *The Craftsman: Gustav Stickley United Crafts, Eastwood, N.Y.* 19. October 1910-March 1911: 200-201.

other naturally toned and textured materials.³⁶ House No. 153 from Series 1916 suggested that if tapestry brick could not be used, clinker brick should be substituted since their varied colors helped to create an interesting wall (image 3-2).³⁷



Image 3-1: Craftsman House No. 38 (1906)
Credit: The Craftsman July 1906

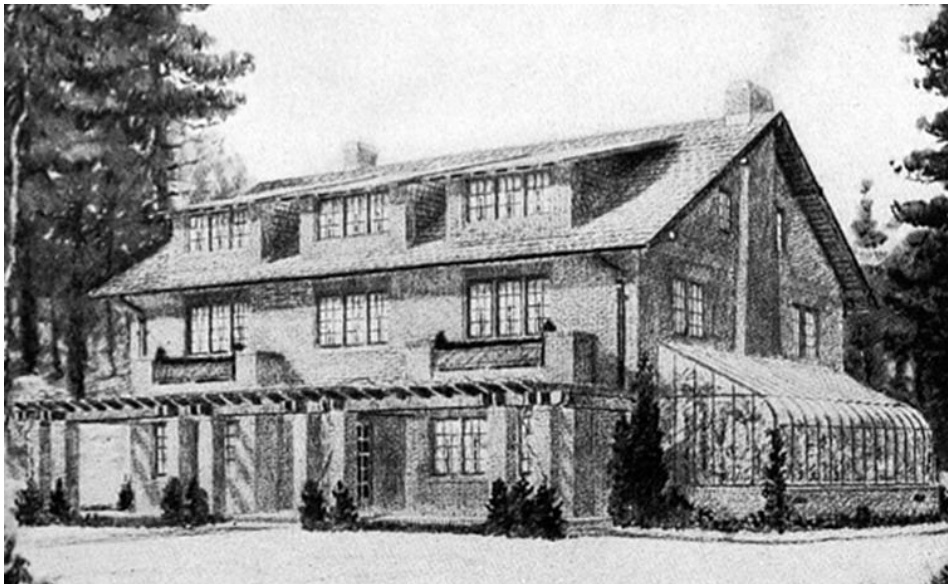


Image 3-2: Craftsman House No. 153 (1916)
Credit: "Popular Craftsman Houses." The Art World

³⁶ Stubblebine. *Stickley's Craftsman Homes*. 199.

³⁷ "Popular Craftsman Houses." *The Art World*. 3. No. 2 (1917): 166-167.

Within the vernacular architecture featured in *The Craftsman* and other Arts and Crafts literature bungalows seemed to be one of the most popular forms of architecture associated with the movement. Many of the designs encouraged the use of clinker brick since its colors and textures reflected the landscape.

3.4 Clinker Brick and The Bungalow Style

The bungalow style, frequently featured in *The Craftsman* and other Arts and Crafts literature, was most popular from the 1900s to the beginning of World War I.³⁸ The style was described as being set low in the landscape. The choice of materials, adjacent living spaces, the incorporation of multiple outside doors, or a combination of all three, allowed for a dialogue between nature and the built fabric. The houses commonly had gabled roofs with dormer windows, front porches, and columns for support that were often tapered.³⁹

Many variations of bungalows existed, depending on the location of the home within the United States. Those often found in Southern California, particularly in Pasadena and Los Angeles were used mostly as permanent homes because the dynamics of the horizontal, spacious, and airy designs were ideal for the temperatures within the region. Clinker brick were commonly used within the architecture of a bungalow. They were installed in conjunction with local field stones in a “peanut brittle style” referring to the textural effect created by the two materials next to each other.⁴⁰ The technique was so frequently used on Californian bungalows that it became associated with the region.⁴¹

Clinker brick captured the ruggedness of the natural environment and were often used in contrast to the clean lines articulated within the design of the house.⁴² Yoho and Merritt, a design company based in Seattle Washington, originally published a series of bungalow plans in their catalogue titled, *Craftsman Bungalows: A Collection of The Latest Designs* in 1912. Many of the featured styles used clinker brick adjacent to or in conjunction with materials such as re-sawed cedar siding and field stones. The dark hues

³⁸ Jane Powell and Linda Svendsen. *Bungalow Details Interior*. Salt Lake City: Gibbs Smith Publisher, 2006. 18.

³⁹ Paul Duchscherer. *Beyond The Bungalow*. Layton: Gibbs Smith Publisher, 2005. 42-43.

⁴⁰ Ibid., 43.

⁴¹ Henry H. Saylor. *Bungalows*. Philadelphia: The John C. Winston Company, 1911. 19-21.

⁴² Ibid.

of the brick provided a great contrast with the lighter materials used for the shingles and other details on the facades of the bungalows.⁴³ The material was seen on the exterior facades (designs 415 and 422), porch walls (design 210), porch columns (design 307), chimneys (design 208), and interior fireplaces (design 449) of various bungalow designs (images 3-3 to 3-7).⁴⁴



Image 3-3: House No. 415
Credit: Craftsman Bungalows: A Collection of The Latest Designs. Craftsman Bungalow Company, 1912



Image 3-4: House No. 422
Credit: Craftsman Bungalows: A Collection of The Latest Designs. Craftsman Bungalow Company, 1912

⁴³ Jud Yoho. *Craftsman Bungalows: A Collection of The Latest Designs*. Seattle: Craftsman Bungalow Company, 1912. 71.

⁴⁴ Ibid.



Image 3-5: House No. 210
Credit: Craftsman Bungalows: A Collection Of The Latest Designs. Craftsman Bungalow Company,
1912



Image 3-6: House No. 307
Credit: Craftsman Bungalows: A Collection of The Latest Designs. Craftsman Bungalow Company,
1912



Image 3-7: House No. 208
Credit: Craftsman Bungalows: A Collection of The Latest Designs. Craftsman Bungalow Company,
1912

Chimneys were a characteristic feature for most bungalow style homes. They were immensely popular due to their ability to mold to individual tastes creating unique homes. Often times these chimneys were constructed entirely of stone, brick, or combination the materials together. As explained in the 1914 article titled “The Prominent Chimney a Feature of The Bungalow” clinker brick was used to create “freaky” chimneys.⁴⁵ Similarly, fireplaces within bungalows commonly used clinker brick to bring the ruggedness of the exterior within the home. Often used for their rich colors and textures, clinker brick fireplaces often spanned from the floor to the ceiling and were installed in various uneven patterns. For example, the Renfro House in Washington State was a Craftsman style bungalow. It had a large clinker brick fireplace showcased as the focal point of living room that lacked any ornamentation, emphasizing the natural attractive qualities of the clinker brick.⁴⁶

The use of clinker brick was seen on many features of Arts and Crafts architecture. Its popularity can be attributed to advertisements and articles but also to the architects who incorporated them into their designs. Two California architects famously associated with the use of natural materials such as clinker

⁴⁵ Charles Alma Byers. "The Prominent Chimney A Feature of The Bungalow." *Popular Mechanics*, (January 1914). 96.

⁴⁶ Janet Ore. *The Seattle Bungalow: People and Houses, 1900-1940*. Seattle: University of Washington Press, 2007. 34.

brick in their beautiful and elaborate Arts and Crafts bungalows were Charles Sumner and Henry Mather Greene.

3.5 Celebration of Clinker Brick by Greene and Greene: Architects of The Arts and Crafts

Movement

The brothers Charles Sumner and Henry Mather Greene, like Gustav Stickley, were heavily influenced by the aesthetic ideologies of Ruskin and Morris and the Arts and Crafts Movement who had an impact on the brothers early in their lives. During their childhood Charles and Henry were trained in the nature of materials, the handling of wood, metal, and tools, giving them the knowledge to become craftsmen. It was however, in 1901 when Charles Greene was first exposed to the Arts and Crafts Movement on his trip to England and later through his exposure to Gustav Stickley's *The Craftsman*.⁴⁷ The experience encouraged the incorporation of the movement's ideologies within his work.

The deepest desire of the Greenes' was to make California "speak" through their work. The sprawling lush landscape was frequently used as inspiration for their design ideals.⁴⁸ For Henry it was achieved through the use of simple lines within designs. For Charles, the romantic dreamer, it was through the integration of picturesque landscapes and a rustic articulation of design. Charles' ideas were derived from his readings of romanticized fiction, especially the stories of William Morris.⁴⁹ The combination of their skills and creativity allowed the brothers to create bungalows of harmonious and distinctive style.

As Arts and Crafts style architects, the choice and use of materials was as important to the Greene brothers as the handiwork implemented to create and execute a design. True to his Ruskinian beliefs, Charles Green said:

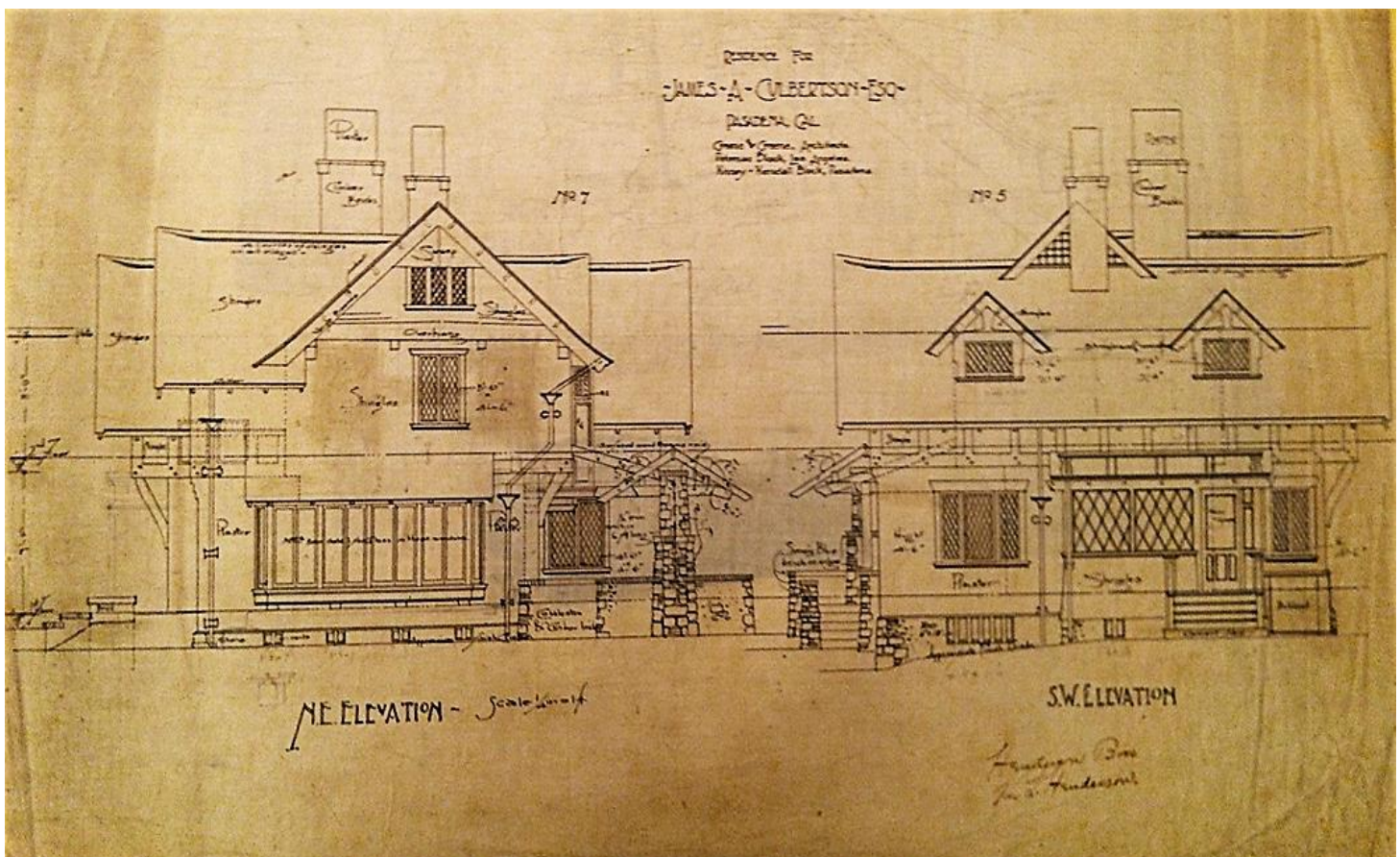
We have got to have brick and stone and wood and plaster; common, homely cheap materials, every one of them. Leave them as they are-- stone for stone, brick for brick, wood for wood, plaster for plaster. Why disguise them?

⁴⁷ "Greene and Greene: The Architecture And Related Designs Of Charles Sumner Greene And Henry Mather Greene: 1894-1934." Los Angeles Municipal Art Gallery, January 27- March 6 1977.

⁴⁸ Kaplan, 267

⁴⁹ Ibid.

Therefore, the brothers selected materials for their natural qualities and how they contributed to the overall design. In picking materials, the Greenes focused on features such as the tactility often implemented through their use of clinker brick. The material was often specified on the architectural drawings made by the brothers for various commissions (image 3-8). Features such as columns, chimneys, facades, and garden walls were designated to be clad in clinker brick.⁵⁰ The Greenes famously used these brick in many of their works and over time they became a hallmark of their architecture, often referencing an idea of a romantic medieval aesthetic.⁵¹



The earliest utilization of clinker brick by the Greene brothers was in 1902 on the Duncan-Irwin House (1902-1905) where the material was found on the chimney. It also appeared on the exterior wall of the Neill House of 1906.⁵² The brick were found on the piers of the James A Culbertson House (1905).⁵³ In the gardens of their masterpiece, the Gamble House (1908), a clinker brick wall at the property's edge created an undulated boundary between the cultivated landscape of the garden and the house's natural surrounding (image 3-9).⁵⁴ The earth toned hues of the clinker brick allowed for a natural blending of the wild surrounding nature with the tamed landscape of the house, producing a harmonious space.



Image 3-9: Gamble House With Clinker Brick Garden Wall
Credit: <http://thecraftsmanbungalow.com/gamble-house>

⁵² Thomas A. Heinz and Randell L. Makinson. *Greene and Greene: Creating a Style*. Layton: Gibbs Smith Publisher, 2004. 47.

⁵³ Morgan L Yost. "Greene and Greene of Pasadena." *Journal of the Society of Architectural Historians*. 9. No. 1/2 (1950): 18.

⁵⁴ Bruce Smith. *Greene and Greene Masterworks*. San Francisco: Chronicle Books, 1993. 49.

Apart from simply using the material for their own aesthetic tastes, clinker brick was also implemented in designs because of its value to the client. This is evident at the Blacker House (1907). Since Robert R. Blacker owned a brick manufacturing company, clinker brick were used for structural and textural purposes, “speaking” to the ground it stood on and also providing a tribute to the family’s business. The house was built in a combination of wood and clinker brick, which were used on the foundations, porte-cochere, chimney, and porch piers.⁵⁵ By 1909, the Greene brothers designed the William R. Thorsen House, which was their most extensive use of clinker brick. The material was found on the retaining walls, stairs, and terrace walls all utilized clinker brick, helping to celebrate the entry into the house (image 3-10).⁵⁶



Image 3-10: William R. Thorsen House With Clinker Brick Wall, Stairs, and Terrace
Credit: <http://thorsenhouse.org>

⁵⁵ Thomas A. Heinz and Randell L. Makinson. *Greene and Greene: The Blacker House*. Salt Lake City: Gibbs Smith Publisher, 2000. 39-42.

⁵⁶ *Ibid.*, 44.

The work of the Greene brothers reflected their love for simplicity as well as the rustic and pastoral themes commonly seen in the Arts and Crafts movement. The attention paid by the architects to materials illustrated their appreciation of nature and its importance to design. This was especially seen through the brothers' trademark use of clinker brick, which not only expressed their aesthetic ideas but allowed the material to grow in prominence.

Chapter 4

Clinker Brick's Appeal in Tudor Revival

Architecture

4.1 The Beginnings of The Tudor Style Architecture

The Arts and Crafts Movement left behind a legacy of design and architecture at the time of its decline.¹ At the heels of the movement's descent, the Tudor Revival style gained a greater presence in the architectural community. With this transition in style, clinker brick remained a popular material.² This was because the Tudor Revival style strived for an aged and rusticated aesthetic in order to reflect a romanticized version of English vernacular architecture. It emphasized roughness, variation, and irregularity within its architecture. This was precisely what clinker brick had become popularized for, allowing for its continued use well after the decline of the Arts and Crafts Movement.³

Tudor Style in England

The English Tudor style was associated with the era of the reigning Tudor monarchs beginning with Henry VII in 1485 and ending with Elizabeth I in 1603, and in some regions with her successor James I.⁴ The style and original aesthetics evolved during a period when fortified castles were no longer needed.⁵ Its architecture mirrored the nature of the English countryside and was created out of locally found materials. Stylistically, the Tudor style had distinguished half-inch thick oak timbers on the facades, referred to as half-timbering. The feature was developed because "it was the simplest, easiest, and quickest way of getting a house..."⁶ The timbers provided structural stability, while their forms contributed to the aesthetics of the houses. Therefore, when installed, they were left exposed on the exterior walls allowing the structures to naturally blend in with the surrounding landscape.⁷ In addition to half-timbering, regional materials such as stone and brick were also employed.⁸ Two-hundred years after

¹ Coy L Ludwig. *Arts and Crafts Movement in New York State 1890-1920s*. Layton: Gallery Association Of New York State, 1983. 10.

² Paul Duchscherer. *Beyond The Bungalow*. Layton: Gibbs Smith Publisher, 2005. 138.

³ Lee Goff. *Tudor Style- Tudor Revival Houses in America From 1890 To The Present*. New York: Universe Publishing, 2002.

⁴ Robert Schweitzer. "Tudor Revival Homes: The English Resurgence in Late 19th Century American Domestic Architecture." *Victorian Homes*, 13. No.3, (1994), 24.

⁵ Goff, 12.

⁶ Allen W. Jackson. *The Half-Timber House: Its Origin, Design, Modern Plan, And Construction*. New York: McBride, Nast, and Company, 1912. 2.

⁷ Schweitzer, 24.

⁸ Leland Hubbell Lyon. "Small Buildings: The English Cottage Type Dwelling." *The Architectural Forum*. January. (1925): 33.

its initial rise, the Tudor style witnessed a revival in England around the 1880s, frequently referred to as “mock Tudor,” since it was replicating a style of an era that no longer was.⁹

During the revival of the Tudor Style, half-timbering continued to be used in conjunction with brick and stone. The style was seen on both large and small homes as well as commercial architecture. Eventually, the English style migrated to the American continent, influencing the domestic architecture of the United States. The American versions of Tudor Revival style looked to replicate medieval style English vernacular houses. This became possible since the emergence of the style in America was concurrent with an era of savvy architects who drew their design ideas from England, through books and travel.¹⁰ The Tudor style was embraced by these architects and utilized for over fifty years in America.

4.2 Tudor Revival Architecture in America

The philosophies of the American Tudor Revival style was accurately described by author, Allen W. Jackson who wrote the book *The Half-Timber House: Its Origin, Design, Modern Plan, And Construction*. He said: “a house should always impress one as being so exactly right that it is almost impossible to imagine any other sort of house in that particular spot. There must be no jar between man’s work and Nature’s.”¹¹ The style emphasized the rustic picturesque beauty of vernacular architecture and the use of local materials that were not mechanically produced, but were hand-crafted or used in their natural state. The ideology behind the style was similar to that of the Arts and Crafts Movement. Therefore, its aesthetics such as half-timbering were often integrated into the Arts and Crafts style homes.

Although examples of early Tudor Revival style homes can be seen in America in the 1870s, the majority of these homes were hybrids of the Stick style and Queen Anne style, primarily using wood.¹² The versions constructed at the peak of the Tudor Revival style’s popularity, in the first and second decades of the twentieth century utilized an array of materials ranging from wood, field stone, stucco, and

⁹ Allison Lee Palmer. *Historical Dictionary of Romantic Art and Architecture*. Lanham: Scarecrow Press, Inc., 2011. "Architecture." 23.

¹⁰ James C. Massey and Shirley Maxwell. "American Houses in Old English Styles." *Old House Journal*, September/October 1991, 46.

¹¹ Jackson, 31.

¹² Tad Burness. *Vintage House Book: 100 Years of Classic American Homes 1880-1980*. Iola: Kraus Publishing, 2003. 6.

brick. These structures were a strand of the Arts and Crafts Movement style architecture and frequently utilized clinker brick within their structures to give them visual interest and a sense of age.

The homes of the Arts and Crafts Movement frequently borrowed aesthetics such as half-timbering from the Tudor Revival style while incorporating its own open plan concept. Gustav Stickley's *The Craftsman* circulated plans and instructions for craftsman homes that incorporated the "half-timber" aesthetic, making it accessible to the average person.¹³ Craftsman House no. 12 featured in the 1906 issue of the magazine, used half-timbering above a cool grey plaster in conjunction with hard burned brick on the exterior.¹⁴ Similarly, in the 1909 edition of the magazine a series of "half-timber cement houses" that showed variations of the Tudor style on Arts and Crafts homes, illustrating its ability to be versatile.¹⁵

Irregular materials such as clinker brick were also seen on the Tudor Revival strand of Arts and Crafts architecture. For example, The Durkin House, located in Spokane, Washington (constructed 1910 by William J. Ballard), is a Craftsman house that incorporated many of the known features of the Tudor Revival such as a pitched roof with dormers and dark stained half-timbers over a lightly colored exterior. For increased character and rustic features, the house used clinker brick on the first floor of the exterior.¹⁶

Clinker brick were an ideal choice for both movements because of their warped character's ability to express the rough textures of the landscape, creating a seamless line between "man's work" of making the brick and "nature's work" of deforming it through a natural process. However, the philosophical contradictions found in the material's use within Arts and Crafts style architecture were similar to those associated with its use on Tudor Revival structures. Andrew W. Jackson clearly stated "manufactured picturesqueness results in a sort of unconscionable stage scenery."¹⁷ However, Americans used these manufactured brick to *stage* their idea of rustic and age in an effort to replicate the styles of English vernacular architecture. These contradictions were disregarded and the physical qualities of clinker brick

¹³ Goff, 21.

¹⁴ "Craftsman House: Series of 1905 Number XII." *The Craftsman: Gustav Stickley United Crafts, Eastwood, N.Y.* 9. October 1905- March 1905: 414-415.

¹⁵ Gustav Stickley. "Cement House Showing Craftsman Idea of Half-Timber Construction." *The Craftsman Home*. (1909): 28-35.

¹⁶ *Spokane Register of Historic Places Nomination*. Spokane: Spokane City/County Register of Historic Places, 2006. "Durkin House, 930 South Lincoln." 3.

¹⁷ Jackson, 31-32.

were extensively used on Tudor Revival architecture throughout its popularity in the early twentieth century.

4.3 The Integration of Clinker Brick in Tudor Revival Architecture

By the nineteen-teens Tudor Revival style houses had established their own footing in the architectural community, independent of craftsman style. A distinctive form of the Tudor Revival architecture was established. It featured asymmetrical massing with multiple steep gabled roofs, dormers, clustered windows to provide ample light and articulated chimneys.¹⁸ The predominant feature on almost all houses, similar to their ancestral English examples, was half-timbering, consisting of exposed wood darkly stained rather than painted. In America, these were thin, surface-mounted boards simply used for aesthetic purposes, making the once structural timbers decorative.¹⁹ The half-timber provided a sharp contrast to the background walls that were usually neutral, light colored stucco.

Irregular massing on the facade and chimney were characteristic of the homes, reflecting the textures found in nature and giving the architecture visual appeal. It was accomplished through the juxtaposition of misshapen field stones and brick, such as warped clinker brick.²⁰ Clinker brick were installed as both regular sized brick as well as veneers attached to wooden frames.²¹ They were used around doorways, window, and on chimneys. Homes with brick walls frequently used a combination of common and clinker brick laid unevenly through skintling, creating textured patterns.²² Additionally, facades that used Flemish bonds had the deep purples and reds of clinker brick headers contrasting with the bright reds of the common brick stretchers. No two clinker brick were exactly alike in size, color, or

¹⁸ Ducscherer, 141-147.

¹⁹ Ibid., 140-141; Schweitzer, 25.

²⁰ Caroline T Swope. *Classic Houses of Seattle: High Style to Vernacular 1870-1950*. Portland: Timber Press, 2005. 130.

²¹ Massey and Maxwell, 47; As the popularity of clinker brick increased within the architectural realm, variations of the material was found on the market. One such type was the clinker brick veneer. One of the earliest uses of this form of clinker brick was found on the exterior facade of a 1905 house by Herbert Hewitt and Frederick Klein, built in Peoria, Illinois. Brick was commonly used as a veneer and installed against frame construction or hollow tiles. Typically, veneered brick were about four inches thick and were thought to possess the good qualities of a wooden house but with a permanent sustainability for the outside environment. They were employed since additional load on an already stable wood frame (or a structure with hollow tiles), was not needed. Hence, materials such as clinker brick veneers were added for ornamental and fireproof purposes instead. They were used as trimmings, on half or the entire facade of a house. Like regular clinker brick, their veneer counterparts were able to be installed in a similar fashion. In a 1925 article in the *Architectural Forum* it was stated that the material could be "laid in a proper bond by breaking the brick in the header courses in half" in order to create the effect of a regular brick. (Lyon, Leland H. "Ten Small Houses." *The House Beautiful Building Annual: A Thorough Revision of The 1925 Edition With Important Additions*. (1925): 35, 62-63.)

²² Swope, 130.

shape; each had an individuality, which gave the wall character and helped to differentiate it from machine-made brick.²³ The ruptured textures and colors of the material also resembled an aged brick therefore in utilizing them, Tudor Revival architecture would more closely resemble the medieval English vernacular structures they were based on.

Clinker brick use during the Tudor Revival style was not as frequently advertised or written about as it was in the Arts and Crafts Movement. Rather, the emphasis in literature was placed more on half-timbering and the general use of materials such as stone, brick, and stucco. However, the use of the brick was common on various buildings of the style throughout the country. The lack of advertisement may have been because at the time the Tudor Revival rose to immense popularity, clinker brick had already been used in architecture for about twenty years. Their use was seen on the three distinctive sized Tudor Revival style homes. The first which was the typical medium sized Tudor home that contained characteristics described in this section. The second was the smaller cottage style and the third was a large scale mansion known as a “Stockbroker Tudor.”²⁴ Furthermore, as the style peaked around the 1920s, America witnessed a rise in apartment building architecture. This trend led to the incorporation of Tudor Revival style won the multi-family homes as well. Each variation incorporated rustic styling often imparted through the use of clinker brick, in conjunction with various vernacular designs from England creating unique architecture.

4.4 Clinker Brick and The English Style Cottage

The Tudor Revival style architecture was loosely based on late medieval prototypes. Though many of its interpretations were dominated by half-timbering, a variant of this was sometimes referred to as the English Cottage. The cottage style was only one or two stories, with an asymmetrical floor plan. It was frequently void of the half-timbering built using a combination of wood, stone, and brick such as clinker brick whose beauty was appreciated through unique installation.²⁵

²³ Myron Bement Smith. "Brick Through The Ages." *Garden and Home Builder*. XLIV. No. 5 (January 1927): 360.

²⁴ Schweitzer, 25.

²⁵ Architecture, Landscape, and Urban Design, "Tudor Revival." Last modified 2011. <http://architecturestyles.org/tudor-revival/>. (accessed March 5, 2013).

In an early reference to the English Cottage, featured in the 1916 issue of *Suburban Life, The Country Side Magazine*, author Raymond Comstock spoke of a small “cottage built for two” where the lower half of the exterior walls were constructed of clinker brick that were “shades in a splendid variety of rich reds, raw siennas, browns and near blacks, lending a sense of warmth that dominates the whole exterior.” The upper walls of the quaint house consisted of silvery grey shingles, while the trimmings were painted a reddish brown. These blended in with the dark red of the clinker brick reflecting the colors of nature.²⁶

In the *House Building Annual Magazine* of 1925, an English Cottage was featured, using a clinker brick veneer, a variation of regular sized brick, frequently found on cottages (image 4-1). Similar to the normal brick, the veneers also consisted of various color ranges from deep red to spots of purple providing visual interest on the quaint house.²⁷ The *Architectural Forum* of 1925 also featured an example of a small cottage located in Cincinnati, Ohio designed by R.C. Hunter and Brother. The white stucco house had a distinctive sweeping roof with small dormer windows and an articulated double brick chimney at one end of the roof, covered in red clinker brick veneers (image 4-2).²⁸

²⁶ Raymond Comstock. "The Cottage Built For Two." *Suburban Life, The Countryside Magazine*. 22. No. 5 (May, 1916): 282.

²⁷ Lyon, 35.

²⁸ Ibid., 51-52.; The use of veneers within the English style cottages, strayed away from its core philosophies of not manufacturing a material and in turn altering its original appearance. Despite this fact clinker brick and their veneers were popular because they reflected a sense of age and provided the structure with visual interest.



Image 4-1: Eight Room English Cottage Type Dwelling, New Rochelle: Leland Hubbell Lyon, Architect
Credit: House Building Annual Magazine 1925



Image 4-2: Gate Lodge at Cincinnati: R.C. Hunter & Brother, Architect
Credit: The Architectural Forum 1925

4.5 The “Stockbroker Tudor” and Clinker Brick

The popularity of clinker brick during the Tudor Revival was also prevalent in the design of mansions referred to as “Stockbroker Tudors.”²⁹ These houses often utilized expensive materials such as: copper, slate, and stone, associated with economic achievement and conservative good taste.³⁰ The building of these structures coincided with a period in which Americans were taking a greater interest in the pursuit of historic authenticity in order to better illustrate their past. As a result, historical details were recreated and used as a way to differentiate the mansions from one another. Unique materials, like clinker brick, helped to create these details. They were used in creative patterns, such as diapering or coupled with other materials to provide a distinct charm to each house.³¹

In discussing the revival style mansion of Stuart Duncan, located in Newport, Rhode Island and designed by John Russell Pope (constructed in 1914), a 1926 article in *Arts and Decoration* magazine described “the spirit as well as the subtleties of early English architecture of the period.” The featured clinker brick were used because they apparently resembled the “blown brick of the fifteenth century” and in combination with the stone and weather oak, “all brought to the exterior the rich vitality and serene beauty of its English prototype.”³² It is unknown however, if clinker brick were actually similar to the historic brick or if they were used as an exaggerated expression of what Americans believed a historic English structure should look like. Regardless, the material’s ability to provide an aged look to the grand “Stockbroker Tudors” resulted in the continued popularity of the material.

4.6 Scarsdale: A Community With Stockbroker Tudors and English Style Cottages

Tudor Revival Style homes became popular in towns, such as Scarsdale, during the its golden age in the 1920s.³³ Scarsdale initially developed as a wealthy suburban community in the 1890s. Its growth in 1913 however, was in large part due to the conversion of New York Central’s rail line from steam to electrical, allowing for a faster connection between New York City and Scarsdale. This transition helped

²⁹ Osbert Lancaster. *Pillar to Post: English Architecture Without Tears*. New York: Charles Scribner's Sons, 1939. 62.

³⁰ Goff, 29.

³¹ Swope, 130.

³² Harriet Sisson Gillespie. "A Superb Replica of Historic Tudor Type." *Arts and Decoration*, 25. (1926) 44.

³³ Elsa Brenner. "Houses Even Bigger, Scores Way Above Average." *New York Times*, May 18, 2008.

those who worked in the city to escape to the suburbs, with more space and less crowd. The home-owner population of Scarsdale in the first half of the twentieth century, like that of most of the inner suburbs that developed in America, was overwhelmingly white, Protestant, and middle to upper-middle-class.³⁴ Many of these residents built medium sized homes, but the neighborhood also has a rich combination of highly decorated cottages and elaborate mansions in the Tudor Revival style. These homes frequently utilized clinker brick to give an appearance of age and rustic beauty that contributed to the picturesque landscape.

Stockbroker Tudors

Many of the Tudor Revival houses in Scarsdale were built with typical characteristics of the architectural style. For example, half-timbers, sharp gabled roofs and defined chimneys were popular. However, these houses were built on a larger scale than the average Tudor Revival house and to add individualized qualities to them, many utilized clinker brick on chimneys, facades, porches, piers and foundations. The material was coupled with irregular cut clapboards, different colored slate roofs, and roughly cut timber; which together created houses reminiscent of America's notion of a medieval England countryside.³⁵

An example is 33 Tompkins Roads, which is an expansive multi-gabled house clad in clinker brick on the side elevations and exterior ground floor (image 4-3). The second story is designed in the quintessential Tudor Revival style with a cream-colored stucco base layered with half-timbered designs. The house has multiple, defined, stacked chimneys with copper coverings and the roof is multi-layered in brown-colored shingles. The grand and picturesque house is surrounded by greenery of the suburban landscape creating an idyllic environment.³⁶

³⁴ Andrew S. Dolkart and Li-Saltzman Architects, P.C., *Village of Scarsdale, New York*. "Reconnaissance Level Cultural Resource Survey Report." 2012.

³⁵ Ibid., 3-7.

³⁶ Ibid., 7-21



Image 4-3: 33 Tompkins Road, Scarsdale, NY
Credit: Andrew S. Dolkart

Other implementations of the brick in varied patterns and arrangements are seen on houses like 37 Penn Boulevard (1930), designed by Frederick G. Frost, constructed entirely of irregular and twisted clinker brick with a volcanic-like appearance (image 4-4). Clinker brick are arranged in varied patterns: on the corners of the polygonal tower the brick are used to create a checker board pattern, while in other areas they form mosaic like squares. The majority of the house is arranged in clinker brick found in two rows of stretcher courses with one row of alternating in header and stretcher. The variegated colors and textures ranging from reds to deep purples are coupled with the brownish red shingles of the roof to create a harmonious structure.³⁷

³⁷ Ibid., 3-10.



Image 4-4: 37 Penn Boulevard, Scarsdale, NY
Credit: Andrew S. Dolkart

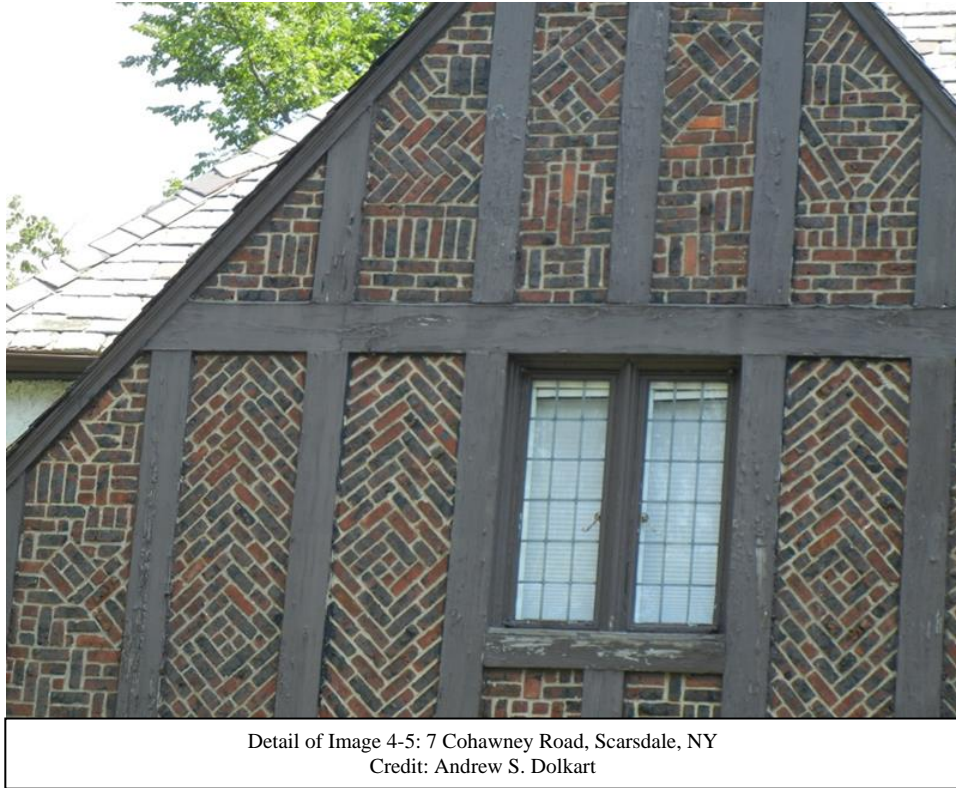


Detail of Image 4-4: 37 Penn Boulevard, Scarsdale, NY
Credit: Andrew S. Dolkart

On 7 Cohawney Road, a home with a multi-gabled roof of slate shingles is found with four facades in which clinker brick is integrated with an assortment of material creating a texturally eclectic home (image 4-5). Two of the four facades, are covered in greyish blue field stones, while a recessed one is in a light-colored stucco, the darkest of the four, is clad in diagonally laid clinker brick found under half-timbering and in conjunction with field stone. To unify the home's aesthetic the brick is also used around the window surrounds of the other two stone covered facades. The technique in which textured materials such as clinker brick, field stone, stucco, and slate are used creates an elaborate house with a mosaic like quality.



Image 4-5: 7 Cohawney Road, Scarsdale, NY
Credit: Andrew S. Dolkart



Detail of Image 4-5: 7 Cohawney Road, Scarsdale, NY
Credit: Andrew S. Dolkart

The home at 38 Chesterfield Road is similar to 7 Cohawney Road, in its use of multiple materials (image 4-6). The facade and chimney of the “Stockbroker Tudor” have alternating uses of light-grey field stone and dark red and purple streaked clinker brick creating a vivid contrast for the house. The clinker brick are used as a base for the half-timbering found on the house. The flat timbers are juxtaposed against the jutting of the clinker brick on various parts of the facade. Some of the windows have surround that are the same color as the dark brown half-timbers while others have limestone surrounds, similar to the entry way. The stacked, defined chimney, constructed in a combination of common and clinker brick stands prominently, while the multi-toned slate shingles provide lightness to the top of the house. This richly built home stays true to the Tudor Revival philosophy in its use of natural materials, implemented in a creative way.



Image 4-6: 38 Chesterfield Road, Scarsdale, NY
Credit: Andrew S. Dolkart



Detail of Image 4-6: 38 Chesterfield Road, Scarsdale, NY
Credit: Andrew S. Dolkart

Cottages

Amongst the grand Stock Broker Tudors seen in the built fabric of Scarsdale, also lie smaller cottages. As previously mentioned, these Tudor Revival cottages were frequently void of the half-timbering found on other Tudor Revival architecture, but still utilized materials such as brick, stone, stucco, and slate.

The quaint cottage located at 125 Brewster Road is a house with a series of stepped facades. The two front most facades are clad in clinker brick creating an undulated surface. The door on the front most facade and the windows on the one directly behind it have surrounds in a faux brown wood, which blend into the mixed colors of the surrounding clinker brick. The two facades are each covered by a sharp gabled roof. Behind these, is the third facade located on second story. It is covered in a light cream stucco (as seen on the remaining elevations of the second story and the chimney) that contrasts with a pair of faux brown shutters flanking the windows. Unlike the gabled roofs found on the first story, the second story is covered in a hipped roof. Finally, the facade furthest back, located on the first story, is again covered in clinker brick with faux brown wood window surrounds. This portion of the house is covered by a gabled roof that is facing the side elevations of the home. The house's brick and stucco exterior is contrasted with the dark grey slate roof whose colors vary subtly.

The orange, red, and dark purple clinker brick prominently seen on the house are arranged in a Flemish bond. The headers are dark burnt clinker brick while the stretchers are orange, red, and beige, warped and bulging clinker brick, jutting out ever so slightly from the facade. The combination of the materials intermingled on the house provide it with dimensionality and character, while the textures and hues of the clinker brick gives it a rustic charm (image 4-7).



Image 4-7: 125 Brewster Road, Scarsdale, NY
Credit: Andrew S. Dolkart



Detail of Image 4-7: 125 Brewster Road, Scarsdale, NY
Credit: Andrew S. Dolkart

A similar multi-gabled cottage is located on 14 Ardmore Road. Here, there are only two front facades, both clad in clinker brick of variegated coloring arranged in either an all header row or all stretcher row. Both facades have sharp gabled roofs that are outlined with a faux brown wood, seen also on the window surrounds. The rest of the structure is contrasted with a light beige stucco present on the first and second floor as well as the chimney. The top of the beige stucco chimney is outlined with clinker

brick creating a deep contrast on the side of the house. The house sits snugly against the surrounding lush landscape creating a picturesque environment that is further emphasized through the juxtaposition of contrasting materials and its prominent clinker brick façade (image 4-8).



Image 4-8: 125 Brewster Road, Scarsdale, NY
Credit: Andrew S. Dolkart



Detail of Image 4-8: 125 Brewster Road, Scarsdale, NY
Credit: Andrew S. Dolkart

47 Montrose Road is a small scale home with a mesmerizing exterior. Field stone are utilized on the front most facade of the house and on the base of the chimney this is accented with clinker brick that is used primarily as an accent around the door and window. The brick however, is extensively used on the recessed portion of the first floor where it is seen in a combination of header and stretcher bonds ranging in colors from dark purple, red, and various shades of orange. Clinker brick is also the primary material on the prominent chimney. It is detailed with white stucco (also utilized on the second story facade) arranged in a stepped pattern and scattered field stones bulging out throughout the structure. Finally, the hipped, gabled roof covering the house is clad in a light grey colored slate that is contrasted with darker grey pieces creating varied patterns. The dramatic application of the highly textured materials on 47 Montrose Road gives an appearance of the house being hand-crafted and not restricted to a particular form. Its creative use of natural material creates a visually spectacular home whose charm is enhanced as a viewer approaches the house (image 4-9).



Image 4-9: 125 Brewster Road, Scarsdale, NY
Credit: Andrew S. Dolkart



The clinker brick use within Scarsdale is evidence of the versatility of the brick and its ability to create varied patterns and textures on a surface. It helped to diversify the architectural landscape of the community while projecting a rustic and picturesque aesthetic.

4.7 Tudor Revival Style Apartment Buildings

The peak of the Tudor Revival style in the 1920s also coincided with the boom in apartment building construction. The architectural features of various revival styles were utilized on the facades of these buildings.³⁸ The Tudor Revival's half-timbering was used in conjunction to clinker brick on various apartment buildings. The style imparted a sense of age, charm, and a picturesque quality similar to that of its smaller-scale residences.

Hudson View Gardens, Manhattan, New York

Built in 1924, Hudson View Gardens was a Tudor Revival style garden apartment complex located in Washington Heights, New York. The apartment building complex was designed by architect

³⁸ Stephen Sennott, editor. *Encyclopedia of 20th Century Architecture: A-F*. New York: Taylor & Francis Books, Inc, 2004. "Apartment Building," 53.

George Pelham and created by Dr. Charles Paterno, a wealthy doctor turned real estate developer. Paterno created the complex for a rising middle class that had the ability to move to the suburbs but wished to stay in the city.³⁹ Pelham designed the Hudson View Gardens buildings in a style “suggestive of the Tudor Period in England...well adapted to the rugged nature of the site.”⁴⁰ Each set of buildings did not look like one another, due to their employment of the varied textured clinker brick. The use of the brick created a rustic community, resembling a bucolic English village.

Clinker brick was intermingled with common brick creating unique patterns and textures reminiscent of “an old English style of architecture within the fourteen buildings located in the complex, producing an ensemble of attractive [buildings].”⁴¹ Approximately ten million brick were supplied by the Anglo-Dutch Tradition Corporation located in the Netherlands for this project (image 4-10). In texts referencing the buildings, these brick were referred to as “Holland Brick.”⁴² Although it was never confirmed that they were clinker brick, upon closer examination of the material, the rough exploded surfaces and multi-faceted colors of the brick resemble clinker brick. Therefore, the name “Holland Brick” may have been given to the material to emphasize its quality as a foreign import, reflecting the high standards used in the construction of the buildings.

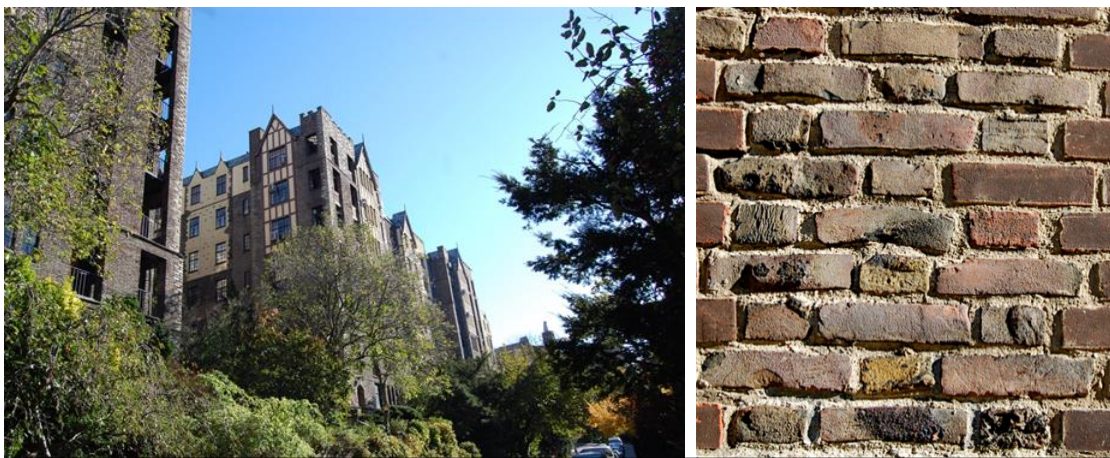


Image and Detail 4-10: Hudson View Gardens, Manhattan, NY
Credit: Alafia Akhtar

³⁹ Andrew Scott Dolkart. "Hudson View Gardens." *Sites*. 37.

⁴⁰ Ibid.

⁴¹ William P. Comstock. "Hudson View Gardens, New York City." *Architecture and Building*. 57. No. 10 (1925).

⁴² "Ten Million Brick From Holland Used In Paterno Colony." *Herald Tribune*, May 4, 1924.; "Holland Brick Being Used In New Construction Work." *Herald Tribune*, June 21, 1925.

United Workers' Cooperative Colony: The First Project, Bronx, New York

The United Workers' Cooperative Colony another Tudor Revival Structure that utilizes clinker brick is located in Bronx Park East. The complex was built as a reaction to the horrendous living conditions that many immigrants faced in New York City. It was designed in 1925 by Springsteen and Goldhammer and constructed in 1926. The apartment complexes consist of four, five-story and basement walk-up buildings, arranged in two groups, each planned in a modified "C", with large open courts on the inside of the complex. These open courts allowed for ample light and air within the buildings, a change from the overcrowded houses immigrant families were forced to live in, in lower Manhattan. Most of the residents of the complex were young families as well as "bachelor apartments" designated for unmarried men, women, or starter couples.⁴³

The apartment complex is constructed in the Tudor Revival style, faced with darkened textured clinker brick laid in a Flemish bond. On the street side of the buildings, the basement level is stuccoed while the upper walls utilize stucco and wooden half-timbering, the quintessential Tudor Revival aesthetic. The windows on the street side have a uniform appearance, each anchored by low corner towers with projecting clinker brick that give the structures an old rusticated vibe. The light court openings, at the fourth and fifth stories are decorated with half-timbered gables, each incorporating window bays.⁴⁴

Clinker brick are again repeated on the courtyard facades in conjunction with stucco, however this side of the structures lack the half-timbering. The stuccoed areas contain irregular clinker brick borders seen also on the vibrant chimneys and parapets.⁴⁵ The use of the misshapen brick throughout the exterior walls helps to unify the residential complex as well as giving the buildings a unique surface and a picturesque aesthetic (image 4-11).

⁴³ Andrew S. Dolkart. *Landmarks Preservation Commission Designation Report*. New York City: Landmarks Preservation Commission, 1992. "United Workers' Cooperative Colony." 4-5.

⁴⁴ *Ibid.*, 7-8.

⁴⁵ *Ibid.*



Image 4-11: United Workers' Cooperative Colony: The First Project, Bronx, NY
Credit: Emilio Guerra

Capitol Hill, Seattle, Washington

On the west coast, developer Frederick Anhalt employed clinker brick to create romantic communities surrounded by beautiful landscaping.⁴⁶ The work of Anhalt, a developer and designer active between 1925 and 1930, was especially known in Seattle, Washington where he created and promoted “the apartment home.” These were small two to four story buildings, modeled after Tudor country manors located in the city’s most fashionable residential neighborhoods. The majority of his work was concentrated in the 1920s, at a time when expenses and growing unpopularity of apartment buildings that had over-saturated the real estate market caused a change of environment. Therefore, developers began to create three-to-five room apartments, often popular with the upper-middle class.

Anhalt’s company designed, built, owned, and maintained these smaller, quaint residences created to feed the demand of small upper-middle class households.⁴⁷ Each of the complexes had beautifully landscaped areas surrounded by Tudor style apartments. From 1929-1930, Anhalt built his best-known projects: five luxury apartment buildings on Capitol Hill.

⁴⁶ John Hancock. *The Apartment House in Urban America. Buildings and Society: Essays On The Social Development Of The Built Environment*. Edited by Anthony D. King. London: Routledge and Kegan Paul Ltd, 1980. 92-93.

⁴⁷ Ibid., 92-93.



Image 4-12: 730 Belmont Avenue, Capitol Hill Apartments, Seattle, WA
 Credit:
<http://dazzlingplaces.com/Seattle/SeattleAttractionsCapitolHillMasterFolder/SeattleAttractionsCapitolHillAnhaltApartments.html>

The structures of Capitol Hill are based on medieval English prototypes and consist of steeply-pitched roofs, turrets, gables, dormers, and decorative clinker brick.⁴⁸ Within the architecture, the unique clinker brick are used adjacent to regular brick creating a distinct textured finishes. The rough appearance of the brick conveys a sense of age associated with the Tudor architecture of medieval England. The stunning shades of earth tones and varied surfaces of the brick allow for the structure meld into the highly textured surrounding landscape (image 4-12).

The unpredictable tactile qualities and colors of clinker brick gave architects the freedom to create unique buildings with a material that was

used for both structural and aesthetic purposes. The Tudor Revival's use of clinker brick in residential buildings, cottages, and mansions helped Americans to recreate scenes of their English heritage through architecture. The style was accentuated through the exploded and warped shape of clinker bricks and its unpredictable colors. It imparted a rustic aesthetic while reflecting the contours of the natural landscape, enabling Americans to nostalgically recreate the English countryside.

⁴⁸ Mimi Sheridan. "The City of Seattle Landmarks Preservation Board: Landmark Nomination Application: Villa Costella." The Historic Preservation Program, Seattle Department of Neighborhoods, 2008. 11.

Chapter 5

The Versatility of Clinker Brick:

Examples of Its Varied Use

5.1 Clinker Brick Use on Varied Architectural Styles

As clinker brick's popularity grew in the early twentieth century, its use became more common. Architects employed it on other building styles to create a distinctive structure through the brick's mesmerizing textures. Many examples of this phenomenon were witnessed in New York State and throughout other parts of the country, particularly the west coast.

5.2 Apartment Buildings

The residential building boom of the 1920s was a result of rapid population growth between 1900 and 1920 and a subsequent housing shortage. It was coupled with the temporary halt of overall construction during World War I.¹ Many architects and designers of these buildings used clinker brick as structural and more importantly decorative features. This allowed for a way to differentiate residences in an increasingly growing metropolis of similar structures.

The Apartment Buildings of George and Edward Blum, Manhattan, New York

The brothers George and Edward Blum designed and built many apartment buildings throughout New York City between 1921 and 1930 integrating clinker brick into their design. In Manhattan, their eclectically styled apartment buildings varied in texture and design imparting a "Neo-Medieval" aesthetic to the structures. In 419 East 57th Street built between 1926 and 1927 the brothers created a structure with pointed arches on the side entryways and arched windows on the second story. Clinker brick are dispersed on the facade juxtaposed with multi-colored terra cotta around the main entryway of the structure. On 360 East 55th Street (1927-1928), arched windows are present in conjunction with an elaborately decorated entryway, and a stepped region of the facade that incorporates sharp geometric windows. Clinker brick are sprinkled throughout the brick structure, used in conjunction with cast stone and field stones, creating a building filled with varied geometry and material adapted for a vibrant metropolis. In their later building, 405 East 54th Street (1929-1930), the Blums created a beautiful mosaic like

¹ Robert J. Gordon. editor. *National Bureau of Economic Research*. Chicago: The University of Chicago Press, 1986. "The American Business Cycle: Continuity and Change." 325-326.

apartment building clad entirely with clinker brick with a scattered use of light colored terra cotta.² The warped brick are assembled in mesmerizing positions and patterns on the lower two stories, providing the structure that was built with no specific style, visual interest.

The Ruxton Tower Apartments, Manhattan, New York

Across town on the Upper West Side of Manhattan, M. Henry Sugarman and Albert G. Berger built a clinker brick clad residential building, The Ruxton Tower Apartments. Located on 50 West 72nd Street, the building was built in 1927 in the Neo-Renaissance style.³ The style is illustrated through the limestone found on the ground floor and arched windows on the second stories. In addition, minimal terra cotta is present in the form of scalloping and arches, above the windows on the second, third and upper most stories. Decorative horizontal bands divide up the building at various levels. The entire building is covered in clinker and common brick. The dark clinker brick are utilized as the headers in a Flemish bond, with common brick stretchers. Apart from the vibrant textures imparted by the decorative brick, the ornamentation of the facade is quite subdued, which helps to showcase the clinker brick.

35-39 West 72nd Street, Manhattan, New York

Across the street on 35-39 West 72nd street stands a clinker brick building by architects Harmon and Hard. Built between 1928 and 1929, the Neo-Romanesque building has a uniquely integrated terra cotta and clinker-brick facade (image 5-1).⁴ Facets of the architectural style are witnessed through the dark- colored terra cotta patterned with different vegetal themes. It is installed around the recessed, arched entryways on the ground level and windows on the second level, while light colored variations are continued in regions of the lower and upper stories of the building. The second story also has an elaborate covered balcony decorated in both a cream colored terra cotta and dark clinker brick arranged in varied patterns creating a kaleidoscope like surface that projects out from the structure.

² Ibid., 44.

³ Marjorie Pearson. "Upper West Side/Central Park West Historic District Designation Report Volume II: Building Entries." New York City Landmarks Preservation Commission, 1990. 284.

⁴ Ibid., 277.



Image 5-1: 35-39 West 72nd Street, Manhattan, NY
Credit: Alafia Akhtar



Detail of Image 5-1: 35-39 West 72nd Street, Manhattan, NY
Credit: Alafia Akhtar

The overall facade of the building is constructed in clinker brick installed in both header and stretcher courses. The intense variegated colors and volcanic appearance of many of the brick that jut out from the facade give the building an exaggerated texture, contributing to the expressive Neo-Romanesque style.

Chelsea Court (Formerly Weitz Apartments), Portland, Oregon

Originally built as the Weitz Apartments in 1925, the current day Chelsea Court is located in the Nob Hill Historic District of Portland, Oregon. The apartment complex was built by Herbert Gordon in a simple classical style. The apartments were constructed in an era associated with the “Streetcar” style, which was particularly popular in Portland between 1900 and 1925.⁵ The “Streetcar” style was generally characterized by two-to-three story rectangular, multi-use structures built along the commercial streets of the city. The residents of the buildings commonly utilized the streetcar service of Portland as a mode of transportation.⁶

The Chelsea Court buildings all have flat roofs with parapets. Classical style elements can be seen by the corbelled cornice, concrete pilasters with brackets and cast-stone reliefs. Concrete steps lead up to the recessed marble entryway.⁷ To contrast the simple decorative elements, the entire structure is clad in clinker brick giving the apartments character and three dimensionality. The deep colors of the brick contrast with the light colors of the cast stone, marble, and concrete allowing for variety within the structure.

5.2-1 Garden Apartments

While most of the country was experiencing an apartment building boom in the 1920s, variations of apartment housing emerged such as the “garden apartment.” The fundamental component of the garden apartment was the integration of landscaped courtyards within the mass of the housing.

Many of these buildings utilized tile, slate, stone, and brick.⁸ Clinker brick was used in conjunction with these other materials to provide a rusticated aesthetic through its three-dimensional textures. It was commonly seen within garden apartments that developed in the outer boroughs of New York City, particularly in Queens.

⁵ Portland: Historic Resource Inventory: City of Portland, Oregon, 1991. “Weitz Apartments.”

⁶ Ev Hu. “Portland’s streetcar architecture -- Past Becomes Future.” *Oregon Live*, June 10, 2009.

http://www.oregonlive.com/portland/index.ssf/2009/06/portlands_streetcar_architectu.html (accessed May 2, 2013).

⁷ Portland: Historic Resource Inventory: City of Portland. “Weitz Apartments.”

⁸ Richard Plunz. *A History of Housing in New York City*. New York: Columbia University Press, 1990. 122.

Jackson Heights, Queens, New York

The term “Garden Apartment” was believed to have been coined for Jackson Heights, Queens, and was used as early as 1917. The community of Jackson Heights consisted of many sets of cooperative garden apartments including Linden Court, Hampton Court, Elm Court, Hawthorne Court, the Towers, and the Chateau Apartments.⁹ Linden Court was the first cooperative apartment building complex in the area, designed in 1919 by Andrew J. Thomas. The ten, four-story, detached buildings were designed to allow for more air, with interior sunrooms and a block long interior garden courtyard.¹⁰ The buildings were inspired by Spanish Romanesque and Renaissance styles, incorporating round arched entrance ways, sun porches, loggias and Mediterranean-inspired patterned brick work.¹¹ Scattered clinker brick are used throughout the facades of the buildings in conjunction with common brick, arranged in a Flemish bond pattern. The deep colors of the clinker brick provide contrast to the warm reds of the common brick, adding to the varied style of the apartment buildings in the complex. Their textured surfaces also harmonize with the irregular formations within the gardens that the buildings surrounded.

The Chateau Apartments (1922), a later addition to Jackson Heights also designed by Andrew J. Thomas, were among the grandest of the garden apartment complexes (image 5-2). They were inspired by the French Renaissance style, incorporating mansard roofs clad in slate, dormer windows, limestone door surrounds, brick chimneys with decorative tops and brick diaper work on the upper stories. The individual buildings are set apart from one another by variations in massing and detail, taking advantage of the multi-faceted textures and colors of clinker brick. The material is used in combination with common brick in diaper patterns on the top half of the corner buildings, of each cluster within the complex. On the other structures it is scattered throughout the surface in both stretcher and header forms.¹² The extremely burnt and ruptured brick varies in color ranging from dark orange to deep purple, while the mortar used for adhesion is a light sand color, creating depth and contrast between the two types

⁹ Daniel Karatzas. *Jackson Heights A Garden in The City*. New York: Jackson Heights Beautification Group, 1990. 54.

¹⁰ Ibid., 48.

¹¹ Marjorie Pearson. "Jackson Heights Historic District." New York City Landmarks Preservation Commission, 1993. 187.

¹² Ibid., 27-28.

of brick as well as the other materials.¹³ The juxtaposed rough surfaces of clinker brick against the ornate French Renaissance style gives the structures a romanticized rusticated beauty that is surrounded by a bucolic landscape.



Image and Details 5-2: The Chateau Apartments, Queens, NY
Credit: Alafia Akhtar

Sunnyside Gardens, Queens, New York

The garden complexes of Sunnyside Gardens in Queens were the first development to incorporate the theories of the Residential Planning Association of America, a progressive organization created as a response to the nation's lack of quality middle and low-income housing.¹⁴ The neighborhood has over six hundred buildings consisting of one and two family homes and multi-family apartment buildings. They were built between 1924 and 1928 with later additions between 1931 and 1935, in Sunnyside, Queens. The structures were designed by Clarence Stein and Henry Wright with the expansive landscape created by Marjorie Sewell Cautley. The site covered almost sixteen blocks, however, only twenty-eight percent of it contained buildings, since much of the housing was built around large landscaped courtyards. Urban historian and longtime resident Lewis Mumford described Sunnyside Gardens as: “an exceptional

¹³ Ibid., 60.

¹⁴ *Guide To New York City Landmarks: New York City Landmarks Preservation Commission*. Hoboken: John Wiley and Sons, 2009. 289.

community laid out by people who were deeply human and who gave the place a permanent expression of that humanness.”¹⁵

The beautiful community of Sunnyside Gardens was built in a combination of Art Deco as illustrated in the creative brick patterns, and the Colonial Revival style seen in the stylized door surrounds, brackets, projecting bay windows, and simple multi-paned windows. The buildings are simply designed, focusing on proportion and arrangement and utilized quality materials that serve as the decor.¹⁶

In the 1920s prospectus for the complex, it is stated that the buildings are “substantial brick homes” with no specification to the type of brick.¹⁷ However, upon investigation of the buildings, clinker brick are clearly present, prominently used as a natural ornament. The unique brick are arranged in various patterns to create differentiated houses all unified by one material. In the one and two family houses and apartment buildings, the brick are used in combination with lightly colored mortar to create contrast (images 5-3 to 5-5). Clinker brick is also seen around door surrounds and in stepped, diapered, and square patterns on the parapet levels of the houses.¹⁸ The application of the brick on the homes of Sunnyside Gardens is interesting since the purpose of the neighborhood was to make the units affordable. With the use of clinker brick which were still a popular and a relatively expensive product, the complex had rich dynamic exteriors surrounded by a picturesque landscape, while still having affordable housing, priced at only eleven dollars a month.¹⁹

¹⁵ Donald Bertrand. "Call It A Historic District: City Taps Sunnyside Gardens." *Daily News*, sec. Queens, July 3, 2007.

<http://www.nydailynews.com/new-york/queens/call-historic-district-article-1.264456> (accessed March 13, 2013).

¹⁶ Tara Harrison and Virginia Kurshan. "Sunnyside Gardens Historic District Designation Report." New York City Landmarks Preservation Commission, 2007.

¹⁷ "Sunnyside Gardens A Home Community." *Sunnyside Gardens Development of City Housing Corporation Long Island City, NY*.

¹⁸ Harrison and Kurshan.

¹⁹ "Sunnyside Gardens A Home Community."



Image and Detail 5-3: Decorative Clinker Brick Ornamentation on Parapet and Door Surround, 39-67 48th Street, Jefferson Court, Queens, NY
Credit: Alafia Akhtar

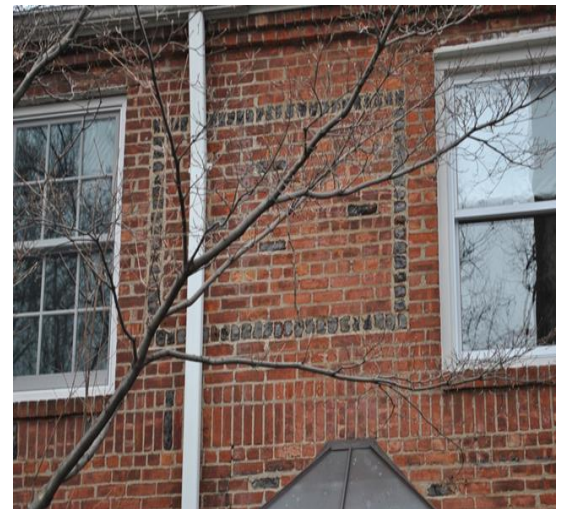


Image and Detail 5-4: Decorative Clinker Brick Ornamentation on Facade, 39-79 to 39-81 49th Street, Harrison Place, Queens, NY
Credit: Alafia Akhtar

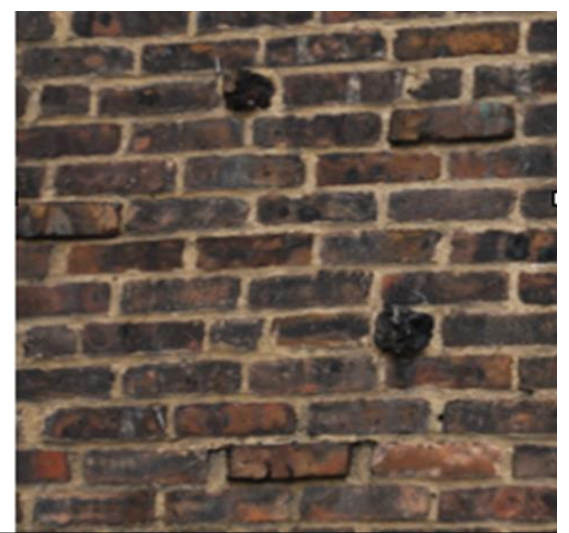


Image and Detail 5-5: Decorative Clinker Brick Ornamentation on Facade, 39-73 and 39-77 47th Street, Roosevelt Court, Queens, NY
Credit: Alafia Akhtar

5.3 Spiritual Buildings

Churches were not frequently known to have been built in the architectural forms commonly associated with clinker brick use. Although examples of these building types constructed in various other styles are found, especially those that used clinker brick as aesthetic accents.

Trinity Episcopal Church, Roslyn, New York

Trinity Episcopal Church in Roslyn, New York, is an early example of clinker brick use on a church built in the Norman-Revival style (image 5-6). The style had similar qualities to the Tudor Revival in that it derived its aesthetics from a countryside setting, but was based on the vernacular architecture of northern France.²⁰ The church was commissioned by the wealthy socialite, Mrs. Clarence MacKay, as a memorial to her mother. It was designed by noted architect Stanford White, of McKim, Mead, and White, costing approximately thirty-thousand dollars and was dubbed by the *New York Times* as “one of the most pretentious on Long Island.”²¹

Built in 1906 to replace an earlier 1862 board-and-batten structure that was designed in the Gothic Revival style, Trinity Church was one of White’s last projects before being murdered (the church was later completed by his partners).³ It is constructed on a Latin cross plan, with Tiffany stained-glass windows, wooden trusses, Vermont slate shingles and dark clinker brick that enveloped the structure. The colors of the brick vary in range from oranges to deep purples, each with its own cracks and lava like texture.²² The majority of the brick are laid in header courses with scattered stretchers, located on the corners of the structure. The brick are embedded into a light cream-colored mortar, creating a sharp contrast, exuding a visually rich aesthetic.

²⁰ Frank J. Forster. "Norman-English Influence in Country Houses." *The Architectural Forum*. XLIV. No. 3 (March 1926): 139.

²¹ "Mrs. Mackay's New Church." *The New York Times*, October 2, 1906.

²² Trinity Episcopal Church: Roslyn, New York, "Trinity Church History: Long Island- Another Time and Place." <http://www.trinityroslyn.org/history.php> (accessed March 7, 2013).



Image 5-6: Trinity Church, Roslyn, NY
Credit: Alafia Akhtar



Detail of Image 5-6: Trinity Church, Roslyn, NY
Credit: Alafia Akhtar

Blessed Trinity R.C. Church, Buffalo, New York

Located in Buffalo, New York, the Blessed Trinity R.C. Church was planned and built between 1921 and 1927 by architects Chester Oakley and Albert Schallow. Derived from the architectural styles of the northern Italian city of Lombardy, the church was built in the twelfth century Lombard Romanesque

style with Byzantine details (image 5-7). It had features such as an octagonal shaped dome, a single gabled roof spanning the elongated entryway, and rich ornamentation. The medieval aesthetic was accentuated with brick as it was a common building material in Lombardy. It was stated that the rough textured “...handmade Harvard Brick... from Exeter, New Hampshire” were used.²³ These were a variation of clinker brick that derived their name from their initial use on Harvard University buildings.

Harvard brick resembled the misshapen brick of the medieval era that were historically warped due to the lack of molds and displacement during firing.²⁴ Apart from the overall use of Harvard brick on the façade of the Blessed Trinity R.C. Church, there was also scattered use of extremely warped clinker brick placed at random on the façade of the church to add to aesthetic and idea using “hand crafted” brick. The unique shapes and variegated colors of the clinker brick gave the structure an antique aesthetic helping to give the church as *appearance* of having been built in the twelfth-century.



Image and Detail 5-7: Blessed Trinity R.C. Church, Buffalo, NY
Credit: Church: Mike Puma, Brick Detail: Andrew S. Dolkart

²³ Rev. Walter Kern. *Guidebook to Blessed Trinity R.C. Church*. Buffalo: 1976. 1-4.

²⁴ *Ibid.*, 5.

The Chinese Baptist Church, San Francisco, California

The Chinese Baptist Church located in San Francisco's Chinatown was reconstructed in 1906 after a destructive earthquake. It was built from recycled clinker brick originally used on the 1887 church, the only surviving material from the tragedy.²⁵ The new design was created by architect G. F. Burlingame and constructed by George M. Moore who built an eclectically styled church dubbed



Image 5-8: Chinese Baptist Church, San Francisco, CA
Credit: http://laprincipessaerrante365.blogspot.com/2011_07_01_archive.html

as the “western style.”²⁶ The church is a rectangular structure with a combination of arched and geometric windows. As a way to complement its varied style, the use of brick also ranges. Lightly colored hand-pressed brick are used as window surrounds and keys on the structure. Common brick installed in stretcher form are used in conjunction with exploded dark purple clinker brick that extrude from the facade and are arranged in header form.²⁷ The use of clinker brick on the church not only served as an emotional reminder to the community of the loss it once suffered, but it also draws attention to the structure through its rough texture and color (image 5-8).

²⁵ Chinese Historical Society of America and Judy Yung. *San Francisco's Chinatown*. San Francisco: Arcadia Publishing, 2006.

²⁶.

²⁶ Philip P. Choy, *The Architecture of San Francisco Chinatown*. San Francisco: Chinese Historical Society of America, 2011.

³³.

²⁷ C.A. Woody. "The New Chinese Church Edifice In San Francisco." *Baptist Home Mission Monthly*. 29-30. (1907): 371.

5.4 Civic Structures

During the span of clinker brick popularity, architects of residential buildings and spiritual structures were not its sole users. The material's use delved into the public realm where it was used to create striking surfaces that drew attention of visitors and passersbys alike.

54th Street Bath and Gymnasium, Manhattan, New York



Built between 1906 and 1911, the East 54th Street Bath and Gymnasium was constructed at a time when public baths began being available for residents of New York City. It was as a result of the 1895 state law mandating public baths in large cities. The East 54th Street Bath initially served poorer clients, providing both showering facilities as well as recreational spaces. It is hypothesized that the space stopped operating as a bath house around 1938 at which time the city began to solely use it as a public gymnasium, which it is still used as today (image 5-9).²⁸.

The Bath and Gymnasium was built by Werner and Windolph Architects in the Classical Revival style. The tripartite structure has a recessed arched entryway flanked with Doric columns set on large stone plinths fanning two stone stairways located at the outermost bays. The arrangement creates a commanding presence on the street, while the curved rooftop which houses the playground distinguishes the structure that is surrounded by flat roofed buildings. The brick columns of the Bath and Gymnasium are adorned with limestone capitals that have

²⁸ New York City: Landmarks Preservation Commission, 2011. "Free Public Baths of the City of New York, East 54th Street Bath and Gymnasium." 1.

Poseidon's trident twisted together with winged dolphins. The columns support a large stone cornice and divide three recessed arches accentuated by arched windows. The East 54th Street Bath and Gymnasium is faced with clinker brick laid out to provide decorative detailing to the structure. Apart from the overall facade, the textured brick is also found on the spandrel panels in conjunction with marble which separate the first and second floors. The brick pattern is repeated on the decorative inverted triangles on the pilasters of the third floor, separating three recessed windows.²⁹ The organic shapes and deep colors of the projecting clinker brick juxtaposed against the formal classical details of the Bath and Gymnasium building give the structure both prominence and character.

Sunnyside Lodge, Portland, Oregon

In Portland, Oregon, clinker brick is adorned on a hybrid Beaux-Arts and Neo-Classical structure known as the Sunnyside Masonic Lodge (image 5-10). It was built in 1919 for the emerging Freemason community



Image 5-10: Sunnyside Mason Lodge, Portland, OR
Credit:wikipedia.org

of Portland. The temple that was once used for the “secretive” fraternal order, now serves as the area's civic center known as the Hawthorne Theater. The building is three-stories, constructed of wood concrete, red brick, and clinker brick.

The Sunnyside Lodge is the earliest work known by Norwegian born carpenter and architect, Olaf Frank Sunde. The primary elevation is given prominence with the use of a series of columns and

²⁹ Ibid., 5-6.

pediments, while the facade varies from the norms of Neo-Classicism and utilizes clinker brick on the east and north walls. Additionally, the cornice of the structure consists of the textured brick in combination with white glazed brick arranged in a decorative motif.³⁰ Behind the Lodge is its Annex building, which was built in 1922. Similar to the main building, the foundation was created of concrete but is shorter and uses “secondary” material of only clinker brick veneer. The brickwork is flushed across the facade and the cornice detail, similar to that on the main building with an alternating combination of white glazed brick and clinker brick.³¹

The unpredictable tactile qualities and colors of clinker brick gave architects the freedom to create unique buildings with a material that was used for both structural and aesthetic purposes. Its uses were not solely restricted to the styles which promoted it most, but throughout its popularity the brick was able to mold to the aesthetics of varied styles illustrating its versatility. However, by the mid to late 1930s, as the building boom began to decline so did the demand for clinker brick. This was coupled with changing aesthetics and the rise of the International Style which stressed clean, simple lines demonstrated both through design and use of material.

³⁰ Christopher Squibb Bell and David Pinyerd. "National Register of Historic Places Register Form: Sunnyside Masonic Temple." Historic Preservation Northwest, 2006. 7-1

³¹ Ibid., 7-4.

Chapter 6

The Decline of Clinker Brick Use

6.1 Emergence of New Trends

The International style was part of the modern movement brought over by European architects. It became the quintessential style of the 1930s in America, utilizing flat roofs, bold geometric forms, and horizontal banded windows. The structures were all created with modern industrial materials like steel and glass as well as concrete and limestone. The buildings stressed volume rather than mass, with an emphasis on the expression of the structural frame rather than on composed facades.¹ Popular revival styles and their accompanied ornamentation were rejected.² Materials such as clinker brick that adorned various buildings of the early part of the century, were deemed “old” and rustic, distracting from the clean geometric lines of Modernism, and therefore, they declined in popularity.

Along with changing aesthetics, the Great Depression of the 1930s plagued the country, the economy suffered tremendously ending the building boom of the early twentieth century.³ Discussions of function and economy were promoted through minimalism and modern design techniques. The efficient utilization of space was a priority over expressive features.⁴ Despite the fact that there were many home owners who did not agree with the aesthetics of modernism (which became mostly reserved for industrial and commercial spaces) houses were not built in the same ornate fashion as they previously had been.⁵ The use of expensive materials such as clinker brick, whose prices were inflated because of high demand and a laborious manufacturing process, were replaced by veneers. Comparatively lighter in weight, veneers resembled commonly used architectural materials such as wood, brick, and stones.⁶

As America entered World War II, the focus on domestic architecture decreased and shifted to the war effort. However, in 1945, as the war ended, millions of soldiers returned home to face one of the greatest housing shortages in the United States. In response to the need, President Harry Truman created

¹ Mark Gelernter. *A History of American Architecture: Buildings in Their Cultural and Technological Context*. Hanover: University Press of New England, 1999. 250.

² Lee Goff. *Tudor Style- Tudor Revival Houses in America From 1890 To The Present*. New York: Universe Publishing, 2002. 28.

³ Eric Arnesen, editor. *Encyclopedia of United States Labor and Working Class History Volume 1 A-F*. New York: Routledge Taylor and Francis Group, 2007. "Another Rise and Fall of Union Strength in Construction: The Great Depression to the Present." 316.

⁴ Gelernter, 252.

⁵ Ibid.

⁶ Stephen Sennott, editor. *Encyclopedia of 20th Century Architecture: A-F*. New York: Taylor & Francis Books, Inc. 2004. "Curtain Wall System." 337.

the position of National Housing Expediter, a post that oversaw an unprecedented effort by the national government to aid in housing development. The construction was done rapidly and inexpensively through the utilization of pre-fabricated houses.⁷

The late 1940s and 1950s witnessed a rise of pre-fabricated homes, in newly formed suburbs.⁸ These houses gave the illusion of being handmade, although they utilized faux brickwork, stucco and finishes that in part attributed to their speedy set-up and low price points.⁹ Developers arranged several simply designed houses along streets of communities such as Levittown, located in Long Island, New York, which contained rapidly built one-and-a-half-story minimalist colonial houses.¹⁰ These structures rested on simple concrete slab foundations, and were built up in an assembly line manner with prefabricated parts.¹¹ As this development in the building market occurred it made housing possible for many. Sadly, unique materials such as clinker brick were not included in the trend. Moreover, the costliness, complicated production and installation process of the brick, did not allow for the speed of construction allotted by prefabricated homes of the mid-twentieth century.

As the housing trends changed within the United States, production of unglazed brick (which includes clinker brick) also dropped. Compared to the annual manufacturing of over eight hundred million unglazed brick in 1925 (a record year), the production dropped to less than four hundred million in 1939, with only a slight improvement to about four hundred and ten million brick in 1949.¹² The fluctuation which eventually resulted in a significant decline of brick use continued well into the 1950s. Additionally, high production and freight costs as well as the growing popularity of new building

⁷ Barry Bergdoll, Ron Broadhurst, and Peter Christensen. *Home Delivery: Fabricating The Modern Dwelling: [Exhibition], The Museum Of Modern Art, New York*. Vol. 1. New York: The Museum of Modern Art, 2008.

⁸ Pat Browne and Ray B. Browne, editors. *The Guide To United States Popular Culture*: Madison: The University of Wisconsin Press, 2001. "Houses." 413.

⁹ Bergdoll, Broadhurst, and Christensen. *Home Delivery: Fabricating The Modern Dwelling: [Exhibition], The Museum Of Modern Art, New York*.

¹⁰ Ibid.

¹¹ Robert Sickels. *The 1940s*. Westport: Greenwood Press, 2004. 69.

¹² "Unglazed Brick." *Construction and Construction Materials*. February (1950): 44.

materials, led companies such as Sayre and Fisher, makers of the *Taylor* clinker brick, to discontinue the manufacturing of common fire brick by the 1950s and 1960s.¹³

6.2 Exceptions to The Changing Aesthetics

Despite the overall decline of clinker brick due to changes in the economic, social, and aesthetic realms of America there are a few unique instances of the material's use by modern architects in the post-war period.

Baker House, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts

Alvar Aalto's Baker House built between 1946 and 1949 on the campus of Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts, is a unique dormitory facing the Charles River. Aalto, a Finnish architect, designed the residential spaces with the goal maximizing the views while simultaneously maintaining privacy for students. He used an unconventional design that involved a long double curved building.¹⁴ Behind the undulating facades, the rooms are not uniform, alternating between concave and convex walls that reflect the curves of the structure (image 6-1).¹⁵



Image 6-1: Baker House, Massachusetts Institute of Technology, Cambridge, MA
Credit: commons.wikimedia.org

¹³ Sayreville Historical Society. *Our Town: Bicentennial/Centennial Album*. Sayreville: 1976. 23.

¹⁴ Richard Weston. *Plans, Sections and Elevations: Key Buildings of the Twentieth Century*. London: Lawrence King Publishing, 2004. 84.

¹⁵ Steen Eiler Rasmussen. *Experiencing Architecture*. Cambridge Press: MIT Press, 1959. 157-158.

Baker House was constructed entirely of brick. Aalto had become reacquainted with the material after hearing a speech by Frank Lloyd Wright who stated “Brick is an important element to the creation of form...It is small, worthless, ordinary thing that costs 11 cents but has a wonderful quality. Give me a brick and it becomes worth its weight in gold.”¹⁶ When the walls of Baker House were erected, all of the brick made for the project were accepted without sorting. This implied that the stack had multi-colored, multi-textured brick of which many were clinker brick.¹⁷ Aalto randomly installed the clinker brick (as well as the others) using fifteen millimeters joints, into the curved structure, adding to its dynamism. The purposeful implementation of clinker brick on the exterior allowed for the exploded surfaces of the brick to relate to the textured landscape of Cambridge at the time of construction.¹⁸ The result was a surface containing nuances of colors and exaggerated textures on a building with visual character in both form and material.

Chapel, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts

MIT’s non-denominational Chapel (1955) created by Finnish-American architect Eero Saarinen, is a thirty-three foot tall, mid-century modern cylindrical building. The structure is built on a shallow moat supported by various sized arches visible on the exterior. The chapel was originally planned as an “island of serenity, a space for contemplation and interfaith worship.” An aluminum bell tower tops the chapel, while dark red clinker brick clad the exterior. The brick are projecting out on the surface creating a subtle visual interest while its textures integrate the structure into its surrounding lush landscape (image 6-2).¹⁹

The dark interior is covered in common brick with scattered clinker brick. Light is only admitted into the building through a circular skylight, placed off center directly above its stark white marble altar

¹⁶ James W.P. Campbell. *Brick A World History*. London: Thames and Hudson, 2003.

¹⁷ Ibid.

¹⁸ Nicholas Ray. *Alvar Aalto*. New Haven: Yale University Press, 2005. 102.

¹⁹ Sarah H. Wright. "Architectural Wonders, Chapel, Kresge Turn 50." *MIT News*, October 19, 2005. <http://web.mit.edu/newsoffice/2005/chapel-1019.html> (accessed March 23, 2013).

block. As the light descends it is captured by a metal screen behind the altar, whose pieces reflect the light from above, creating an ideal space for reflection.²⁰

The choice of clinker brick was an important facet in creating a distinctive structure, this idea was implied in the text *Modern Masonry Natural Stone and Clay Products* written two years after the construction of the chapel:

Saarinen's eggshell-thick plastic-covered concrete dome with walls of aluminum and glass is balanced against a cylinder of brick which encloses one of the most inspiring chapels of our time. Much of the success of the chapel, as well as some of the interior brickwork beneath the auditorium dome, results from the search for the selection of brick with inherent individuality and variety in size and color, and a mortar color that blends with the diversity of the units into a unity of the whole wall to achieve a satisfaction made more thrilling because of its apparently artless subtlety.²¹

Within this seemingly simple structure of the Chapel is a complicated composition of contrasting lines, arches, and unpredictably textured material like clinker brick, creating a unique space.



Image 6-2: Chapel, Massachusetts Institute of Technology, Cambridge, MA
Credit:

<http://architectslike.tumblr.com/post/4815985441/chapels>

²⁰ Leland M. Roth. *American Architecture a History*. Boulder: Westview Press, 2001. "The Emergence of Modernism, 1940-1973." 437-438.

²¹ *Modern Masonry Natural Stone and Clay Products*. Washington D.C.: National Research Council: Publication 466, 1956. 10.

Despite the examples of the few mid-century modern structures that utilized clinker brick, the overall popularity of the material had declined by the late 1930s as tastes changed. Today, these brick are valued as they had been during their peak. They are seen as unique material contributing to the diverse architectural landscape of this country. Restoration projects have been undertaken to prevent the deterioration of the brick, while various manufacturers within the country continue to produce the material on a need basis for replacement purposes and in special cases new construction.

Chapter 7

Clinker Brick Today

7.1 Issues With Clinker Brick

It is unknown if clinker brick have distinctive deterioration patterns dissimilar to other types of brick, since there is no significant amount of technical research conducted on the material at present. However, similar to other brick, damage to clinker brick can occur through the application of waterproof coatings, such as impervious paint or stucco, which block off exit regions for water. If salt is trapped within the pores of the brick and water is unable to be released, it can cause expansion of salt crystals within the pores, creating unwanted cracks and increasing entry points for water.¹ Since clinker brick have a vitrified surface with open cracks, after there is water infiltration within the brick, more cracks are formed. These create greater entry points for water and susceptibility to damage as compared to a regular brick.

Deteriorated joints between brick can also exacerbate conditions of the material by creating additional entry points for water. Evidence of weakened brick can be witnessed through delamination, built up of efflorescence, cracking, and in some cases the presence of mold.² In clinker brick since the material is distorted, often times during installation mortar is hard to apply and done so unevenly. Therefore, when a clinker brick surface is in need of repointing, masons may be unable to reach all of the crevices properly leaving open areas for future water infiltration.³

7.2 Examples of Clinker Brick Deterioration

Linden Court, Jackson Heights, New York

Linden Court, an apartment complex in Jackson Heights, Queens is a structure that uses clinker brick in conjunction with common brick on its facade. In the past, issues with both types of brick have risen specifically on the parapet walls of a few of the buildings within the complex. The walls are arranged using three courses of clinker and common brick, with a limestone band running along the top, and copings consisting of slanted roman tiles used as shingles.

¹ Harley J McKee. *Introduction to Early American Masonry, Stone, Brick, Mortar, and Plaster*. Washington D.C.: National Trust for Historic Preservation, 1973. 55-56.

² Joseph Chillino. *Restoration Preservation an Old-Timers Notebook*. Port Jervis: Manuscript, 2012. 49-53.

³ J.W. McBurney. "The Compressive and Transverse Strength of Brick." *Bureau of Standards Journal of Research*. 2. (1929). 830-834.

Deterioration

During the initial investigation of Linden Court in 2003 done by the firm Cutsogeorge, Tooman, and Allen Architects from New York, various forms of deterioration were found on the parapet wall. During its initial construction, for aesthetic purposes, the chimneys of the building were hidden within the parapet walls. Their use and resulting vibrations over the years, caused the formation of cracks along the walls. With the fear of water infiltration due to the cracks, mastic was smeared onto the walls for waterproofing purposes.⁴ The material prevented the brick from respiring. Moisture still managed to seep in through the waterproof membrane in the form of liquid vapor, creating bubbles in the mastic. The combination of mastic and moisture caused the brick in contact, to “cook” and deteriorate. An additional issue with the parapet wall involved less than optimal overhang of the tiled coping that was used to help water run off the building. Since a sufficient angle for the shingles was not incorporated, the parapet walls underneath the overhang were frequently exposed to water resulting in excessive moisture build up and consequent deterioration (image 7-1).⁵



Image 7-1: Damaged Region of Linden Court, Prior to Repair
Credit: Cutsogeorge, Tooman, and Allen Architects

⁴ The book titled *Fundamental Building Technology* by Andrew J. Charlett and Craig Maybery-Thomas mastic is defined as a naturally made material. It consists of bitumen and natural asphalt rock or fine limestone aggregate. Under normal conditions mastic is found solid, but when heated becomes fluid and allows for easy application. The flexible material is waterproof and can either be applied to exteriors or interiors systems within a building.

⁵ Daniel Allen. Interview on the Restoration of Linden Court. Conducted by Alafia Akhtar. March 13, 2013.

Repair

After thoroughly inspecting the deterioration of Linden Court, work on repairing the damaged brick on the parapet wall began between 2003 and 2005. Each damaged set was slowly removed, worked on, and rebuilt, prior to beginning work on another section. This method of repair prevented disruption of the buildings' structural stability. As a result of deterioration, four types of brick had to be reproduced: red, rusty red, over burned stretcher and header, and clinker brick. Ragland Clay Products of Ragland Alabama provided the replacement clinker. In order to produce brick of accurate size, color, and shape, mock ups were created for approval by the project contractor and preservation architects. Once the brick were created up to standards, they were installed using Type N mortar, often used for restoration because of its even balance of Portland cement and Lime. The mortar was mixed using a one part sand, one part lime and four and a half to six parts aggregate ratio. It was then color matched using a formula from Glen Grey colored mortar (an ideal choice since no additives are added into the material). For additional reinforcement after the brick repair, copper and resin-based flashing were installed between the roof and parapet in order to protect the masonry material from excess moisture (image 7-2).⁶



Image 7-2: Repaired Brick and Installation of New Overhang
Credit: Cutsogorge, Tooman, and Allen Architects

⁶ Ibid.

The restoration work on the buildings of Linden Court illustrated the issues that arise with excessive moisture and application of impervious materials on masonry material. In the case of these structures, both types of brick were affected by excessive moisture causing the same problems and undergoing the same repairs.

First Battery Armory, Upper West Side, Manhattan, New York

The First Battery Armory (converted to the 102nd Medical Battalion) designed by Horgan and Slattery Architects, was built between 1900 and 1903. It is a three-story structure located on 56 West 66th street in the middle of the block of West 66th Street between Central Park West and Columbus Avenue in New York City. The principle facade of the building, the head-house, resembles a symmetrical medieval castle, vertically divided into two parts. A central pavilion is connected by two hypens to two projecting towers at the east and west ends of the building. The structure also has medieval architectural elements such as: a battered base, loophole windows, entry arches, crenellated parapets, and fenestration in classical proportions with rustic Gibbs surrounds made of granite. The upper stories of the structure are decorated using two-toned brickwork in a Flemish bond typically found in eighteenth century England.⁷ These brick are red face brick stretchers and dark burned clinker brick (in this case the clinker brick are less warped and primarily contain severe cracking).

Currently the structure is owned by Disney while ESPN occupies it. The New York office of Building Conservation Associates, Inc. (BCA) first examined the former First Battery Armory in 2010. During the initial investigation various forms of deterioration were found on both the parapet walls and main façade of the structure.

Deterioration

The parapet walls are a four wythe thick crenelated brick masonry system constructed in a Flemish bond and Rosendale cement mortar. Upon investigation it was found that the original Rosendale cement used to lay up the structure as well as a later over-pigmented black colored re-pointing mortar had deteriorated to the point that they both were allowing water to enter the building wall. In addition, both

⁷ Michael Corbett. "First Battery Armory." Landmarks Preservation Commission Designation Report, 1988. 10.

materials were absorbing and retaining water due to their advanced deterioration. The sponge like effect of the mortar and cement infill and the mortar's deterioration caused open joints on the parapet wall, creating additional regions of water infiltration into the building.

The excessive water infiltration resulted in open surface cracking and isolated loss of material. In this case, the results lead to about twenty percent of the clinker brick on the parapet walls to exhibit deterioration, while the face brick remained unaffected. The clinker brick were most likely damaged due to the absorption of water by surface cracks, regions where the mortar had deteriorated, and areas where the Rosendale cement retained moisture. These factors resulted in trapped water on all four sides of the clinker brick, with no exit. This is especially problematic since clinker brick are known to have an intensely vitrified core with a tight network of pores. They allow for little to no clear pathway for water to move in and out of the brick, especially in a high moisture situation found on the First Battery Armory.

Previously, as a preventative measure, mastic containing asbestos was applied to the parapet wall without weep holes as a way to direct the moisture out of the structure. This measure proved insufficient and as a result, about three quarters of an inch of each deteriorated clinker brick popped off the surface. A similar form of damage was also seen on isolated regions of the main façade however, only about one to five percent of the brick had deteriorated in those regions (image 7-3).⁸

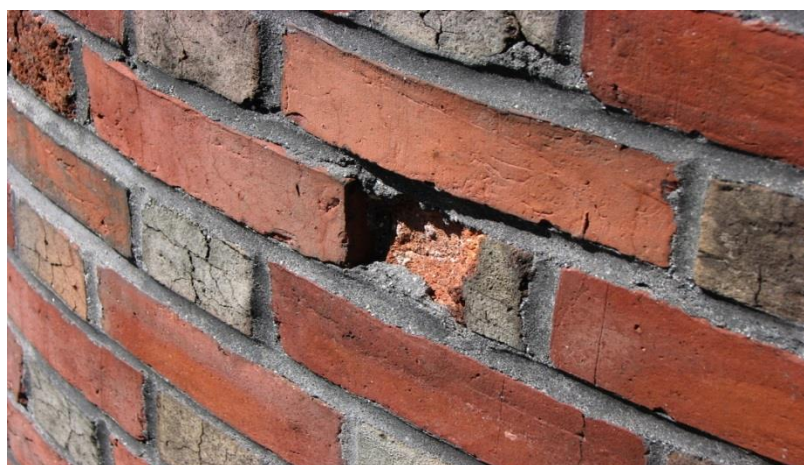


Image 7-3: Deteriorated Clinker Brick
Credit: Building Conservation Associates, Inc.

⁸ Christopher Gembinski. Interview on the Restoration of the First Battalion Armory. Conducted by Alafia Akhtar. April 4, 2013.

Repair

After thoroughly inspecting the deterioration of the First Battery Armory, work on repairing the damaged brick on the parapet wall began in 2013. Damaged brick were removed and replaced with a high-fired new face brick that was burnt to match the color, but lacked the cracking of the original clinker brick. New mortar was color matched to the original black mortar of the structure (image 7-4).⁹

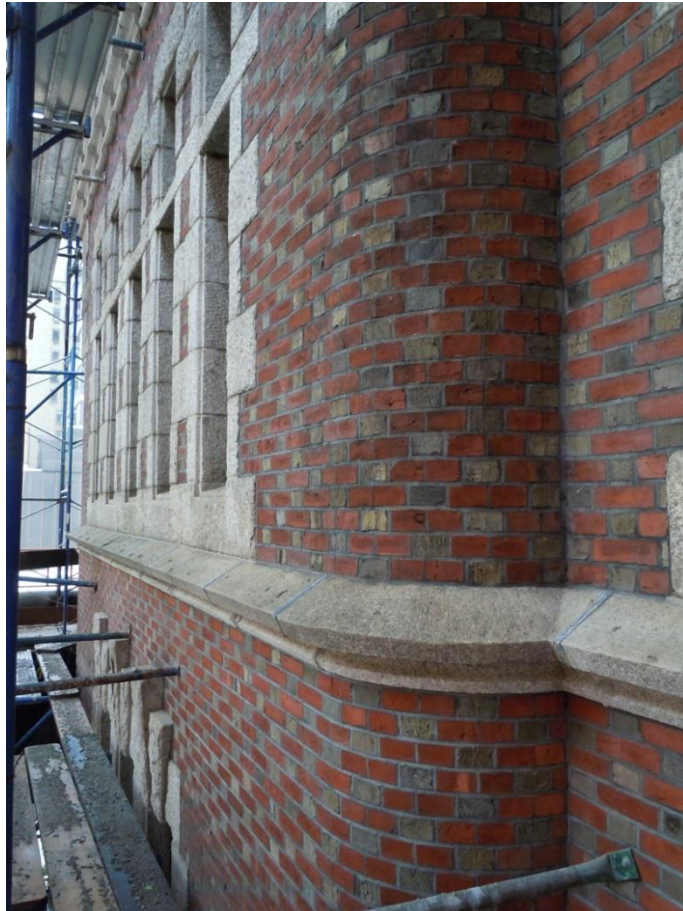


Image 7-4: Deteriorated Clinker Brick
Credit: Building Conservation Associates, Inc.

The restoration work on First Battery Armory was unique in that the deterioration was solely found on the clinker brick. It is an interesting case because it shows how its pore structure can cause vulnerability. Especially in high moisture situations as witnessed in the First Battery Armory. Water was infiltrated into the structure through many entry points, forcing the clinker brick to absorb it through all of

⁹ Ibid.

its surfaces. The lack of a clear roadway for water, due to the brick's solid vitrified core, lead to its demise, causing delamination and eventual need for replacement.

7.3 Reproduction of Clinker Brick

The preservation of clinker brick buildings often requires the reproduction of the used material in order to replicate the original intended aesthetics of the building. Today very few clinker brick manufacturers exist in the country. Vermont Brick, Brick Works, and Ragland Clay Products are a few companies that manufacture these rough textured brick. Though majority of the processes in making clinker brick is proprietary, basic manufacturing aspects are known.

Companies such as Vermont Brick create the unique brick utilizing clays with different firing curves in a kiln. It also employs a unique small shuttle kiln that distributes heat in a manner similar to older larger stationary kilns such as scove and beehive.¹⁰ It is essential to use this type of oven as opposed to a tunnel kiln for two reasons: historically, clinker brick resulted because of the lack of uniformity in heat distribution in stationary kilns (an issue later remedied by tunnel kilns). Additionally, when clinker brick are made, they often sinter together and become misshapen creating an uneven distribution in weight. Therefore, since brick in a tunnel kiln are stacked in a car which moves through the tunnel, the uneven weight of fused clinker brick can cause a stack of brick to topple over and bring the entire process to a halt. The kiln has to be cooled and emptied and then again reheated to continue the process, which can be time consuming and costly.¹¹ Hence, companies use smaller versions of the stationary kilns where brick remain in one position, to create clinker brick.

The clinker brick making process involves the heating of raw brick to temperature of over nineteen hundred degrees Fahrenheit.¹² Once the burning is completed, masons go into the kiln and hand pick the brick that match a desired aesthetic. Though the process of creating clinker brick is still long, most companies are able to produce a set amount of clinkers during each burn process.

¹⁰ Peter Soucy. Interview on The Reproduction of Clinker Brick. Conducted by Alafia Akhtar. March 12, 2013.

¹¹ Lynda Evans. Interview on Brick Works Clinker Brick Manufacturing. Conducted by Alafia Akhtar. January 25, 2013.

¹² Soucy Interview.

With the successful production of clinker brick by companies today, it is also important to note that every pallet will not contain the same variation of colors and textures. As opposed to the historic use of clinker brick, which embraced the unpredictable variations, today reproductions emphasize accuracy in order to properly restore a building. Therefore, manufacturers have to closely and forcefully match the brick to their historic counterpart. However, as stated by Mr. Peter Saucy, Vermont Brick's manufacturing consultant:

“Matching” existing brick on rehab and preservation projects in Greater New York City today is complicated and often, an exact match simply is not available at any cost. This is not due to a failure of will on the part of today's brick makers. It is simply a reflection of manufacturing and ceramic science reality.¹³

The replication process is harder today because many of the brick used in historic buildings were from brick manufacturers that no longer are in business. The color, geometry and texture of a brick was often driven by the availability of clay, shale, or a mix of both near the plant locations. This chemistry of the clay in conjunction with specific kiln characteristics, and the type of fuel used, created the specific brick: “unlike most other things we think of as ‘baked’, individual brick recipes (clinker brick included) are seldom ever transferable to other locations.” Therefore, a perfect match is never possible, though a near perfect match is obtainable.¹⁴

7.4 Further Research

Research, on a particular topic, is never ending. While conducting research and formulating arguments for this thesis, a few aspects of clinker brick remained unanswered. Therefore, for future study the following should be considered:

Did clinker brick transition into an architectural phenomenon in other countries outside of the United States, particularly England, where the Arts and Crafts Movement first emerged? Was this the inspiration for architects such as Albert C. Schweinfurth (the designer of Volney D. Moody House) one of the earliest architects to use clinker brick decoratively in America? Also, in America, what company was the first to sell clinker brick as decorative material? Who and what prompted their decision to do so?

¹³ Ibid.

¹⁴ Ibid.

These questions will help to further solidify the transitional period of the material and give a better foundation in understanding how this trend truly emerged in America.

From a technical standpoint, hardly any research has been conducted on solely clinker brick. Apart from the two deterioration case studies posed in this thesis, it would be interesting to know if there *are* common deterioration issues with clinker brick, or do they truly follow similar patterns as other brick? Additionally, can clinker brick be re-used? If so, does it have a limit to its re-usability and the ability for mortar to re-adhere? Finally, due to the over burned character of clinker brick, what is the general soak time for the brick for both first time use and re-installation? Is this similar to brick in general and do brick layers have a set standard?

7.5 Conclusion

Until this thesis, clinker brick was an understudied material. Its historical value went unrecognized even though it was admired from afar for its wild textures and multi-colored surfaces. Hence, understanding the aesthetic history of the brick allowed for a better contextual understanding of structures that utilized it. This thesis was able to create a continuous timeline of the transition of clinker brick from being a worthless discarded material to one of value and specially produced by manufacturers. Its rise to national popularity can be closely associated to the introduction of the Arts and Crafts movement within America continuing through to the Tudor Revival and in some cases modern architecture. The material's use, recognition, and value in history and architecture truly attests to the idea that "one man's trash is another man's treasure."

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