The Green & DeLaittre Wholesale Grocery Company Warehouse Historic Designation Study

500 North Third Street

Prepared for the
Minneapolis Heritage Preservation Commission

April 19, 2010

City of Minneapolis
Department of Community Planning & Economic Development - CPED

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1 Introduction

1.1 Designation Study Background and Purpose

On December 2, 2008 the Minneapolis Heritage Preservation Commission (HPC) held a public hearing on the nomination of 500 North Third Street, the Green & DeLaittre Grocery Warehouse Building, as a local historic landmark. The Minneapolis HPC placed the property at 500 North Third Street under interim protection and directed the Planning Director to commence a designation study for the property at 500 North Third Street.

The following report is the designation study for the property at 500 North Third Street. The study is based in a review of primary resources including newspaper clippings from the Minneapolis Collection of the Hennepin County Libraries, photographs from the Minnesota Historical Society's Visual Resources Database, as well as a number of primary resources from the University of Minnesota's Northwest Architectural Archives.

Address:	500 North Third Street
Neighborhood:	North Loop
Permits Issued:	October 7, 1908
Architect/Engineer:	Claude Allen Porter Turner
Architectural Style:	Commercial Warehouse
Period of significance:	1908- 1948
Significant dates:	1908 - Date built; 1921 - Green & DeLaittre Co. merger with Western Grocery; 1948 – Closed as a grocery warehouse
Significant persons:	C.A.P. Turner, T.H. Green, Karl DeLaittre
Areas of Significance:	Engineering, Industry

2 Property Description

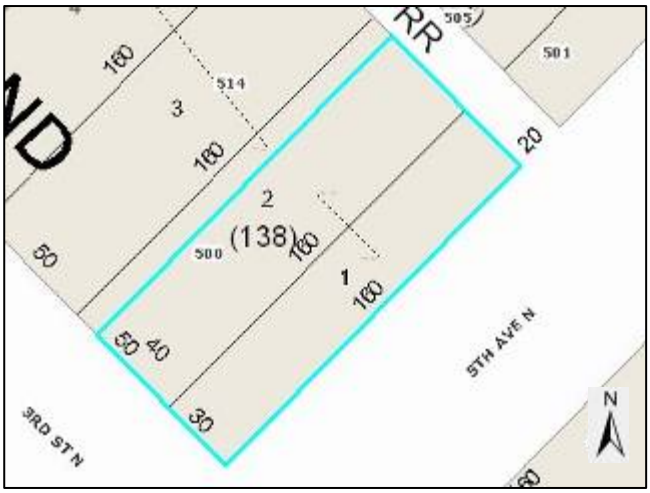
The Green & DeLaittre Company Wholesale Grocery Warehouse Building at 500 North 3rd Street is located in the North Loop Neighborhood in downtown Minneapolis. The property consists of one originally platted lot and an additional 40 feet of an adjoining lot, stretching 70 feet in width and 160 feet in depth at the corner of 3rd Street North and 5th Avenue North (Figure 2.1). The property is adjacent to a former Great Northern Railroad Spur line. The spur line ran along the northeast wall of the building. The property is a contributing resource to the Minneapolis Warehouse District which is listed on the National Register of Historic Places and is a locally designated historic district in Minneapolis. (Figure 2.3).

2.1 Exterior:

The warehouse is a four-story rectangular flat roof building reaching approximately 53 feet in height. Three elevations – the east south, and west – are finished in the same manner with reddish brown brick masonry (Figure 2.4). The building features a corbelled cornice that is completed in the same reddish-brown brick masonry (Figure 2.5).

The ground floor window openings are original, however the openings are currently in-filled with a variety of materials including glass block, concrete masonry, painted plywood, solid steel doors, and aluminum-framed windows (Figure 2.6).

Figure 2.1: Lot Dimensions of 500 N. Third Street



Source: Hennepin County Property Information

Figure 2.2: Context image of 500 N. Third Street, looking north

Source: Bing Map,2009

Figure 2.3: Minneapolis Historic Warehouse District

Source: Minneapolis CPED – Planning Division, December 2008

The windows on the southeast and southwest (street-facing facades) are arranged in a simple pattern. Single windows are arranged in regular bays across the facades. The corner bays include a paired window (Figure 2.8 and Figure 2.9). The windows on the east facade also follow the simple fenestration pattern of the two street facing facades; however the east facade does not contain the double windows in the corner bays and the fourth floor includes an additional window centered between the third and fourth bays (Figure 2.10). The window frames and sashes are original and are double hung with a two-over-two divided light pattern (Figure 2.7). There are no windows on the northwest facade of the building (Figure 2.11).

Figure 2.4: Birdseye Image of 500 N. Third Street with Elevation Labels

Source: Bing Maps, 2009

Figure 2.5: A corbelled cornice defines the roofline of the south, east and west elevations

December 2009

Figure 2.6: Example of a filled in ground floor opening with glass blocks and concrete

Figure 2.7: Two over two divided light windows

December 2009

Figure 2.8: Fenestration pattern on western elevation

December 2009

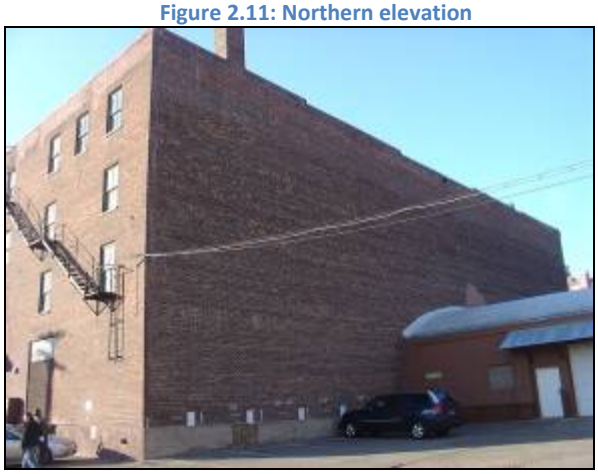
Figure 2.9: Fenestration pattern on southern elevation

December 2009

Figure 2.10: Fenestration pattern on eastern elevation

December 2008

Figure 2.11: Northern elevation



The east facade of the building contains an original fire escape the runs from the fourth to second floor (Figure 2.10).

Based on pictorial evidence, the south elevation originally contained four entrances at bays 2, 4, 6, and 8 and the east elevation had two entrances in the second and third bays. These original ground floor openings have been retained; however they have been filled in with a variety of materials including glass block, concrete masonry, painted plywood, solid steel doors, and aluminum framed windows (Figure 2.6).

Figure 2.12: 1914 Minneapolis Plat book

Source: Minneapolis Collection

Flanking the south elevation is a loading dock which is approximately 14 feet in depth. It has a slight grade from the east to the west. A staircase leads from the alley to the loading dock, giving access to the original ground floor entrances on the south elevation (Figure 2.13).

An 85 foot long metal canopy constructed of corrugated metal over a steel frame covers the loading dock on the southeast facade of the building (Figure 2.13). City building permit records indicate it is unlikely that the current canopy is original to the building; however, it is likely that a similarly sized canopy was included in the construction of the building. Records show that there were three canopies added to the warehouse in 1921 that measured 15 feet in width and 14 feet in depth; a fourth was added in 1923. A canopy similar in style is over the entrance opening of bay two on the east elevation; however it is only 11 feet in width (Figure 2.14).

On the east elevation is a narrow loading dock area that extends less than a foot in depth from the building wall (Figure 2.14). The is facade of the building was adjacent to the Great Northern Railroad Spur lines that extended between Third Street North and Washington Avenue North (Figure 2.12). This was likely the primary original loading and unloading area for the building to the railcars.

The rooftop of the building contains an elevator penthouse and a brick chimney that are original to the building (Figure 2.15).

Figure 2.13: Loading dock and canopy on south elevation, looking east along 5th Avenue North

October 2009

Figure 2.14: Loading dock and canopy, east elevation

December 2009

Figure 2.15: Brick chimney from east elevation

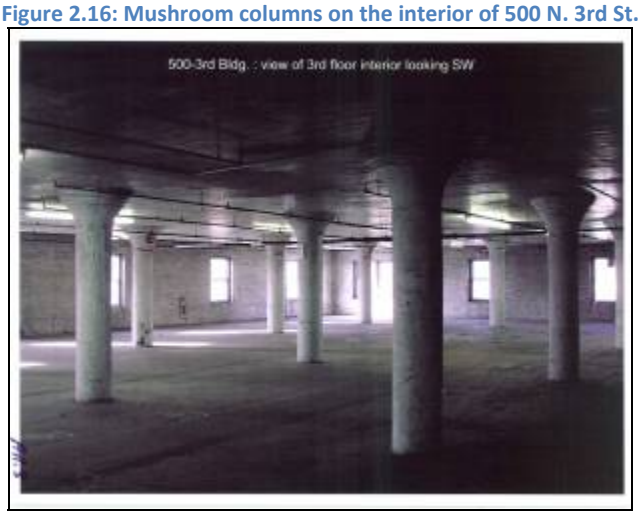
December 2009

2.2 Interior:

The exterior appearance of 500 North Third Street does not reveal its innovative structural system. The building is an earlier extant example of Claude Allen Porter (CAP) Turner's flat-slab reinforced concrete design with mushroom capital columns in Minneapolis. The invention of these load-bearing columns eliminated the need for dropped beams and girders, allowing for a number of benefits including better fire protection, improved light and air flows, and increased usable space among other things. The columns are known as the Mushroom System, though not for the flaring capital at the top of the column, but for the shear head shaped like a shallow truncated cone that is concealed in the concrete slab.[1] Reinforcing rods extend both directly and diagonally between the columns. Additional reinforcing hoops are laid on the radial rods (Figure 2.18 and Figure 2.19).

At 500 North Third Street, each of the four above-ground floors and the basement level contain 21 of these mushroom capital columns (Figure 2.16 and Figure 2.17). The spacing of the bays is approximately 16 feet by 15 feet 6 inches.

Figure 2.16: Mushroom columns on the interior of 500 N. 3rd St.

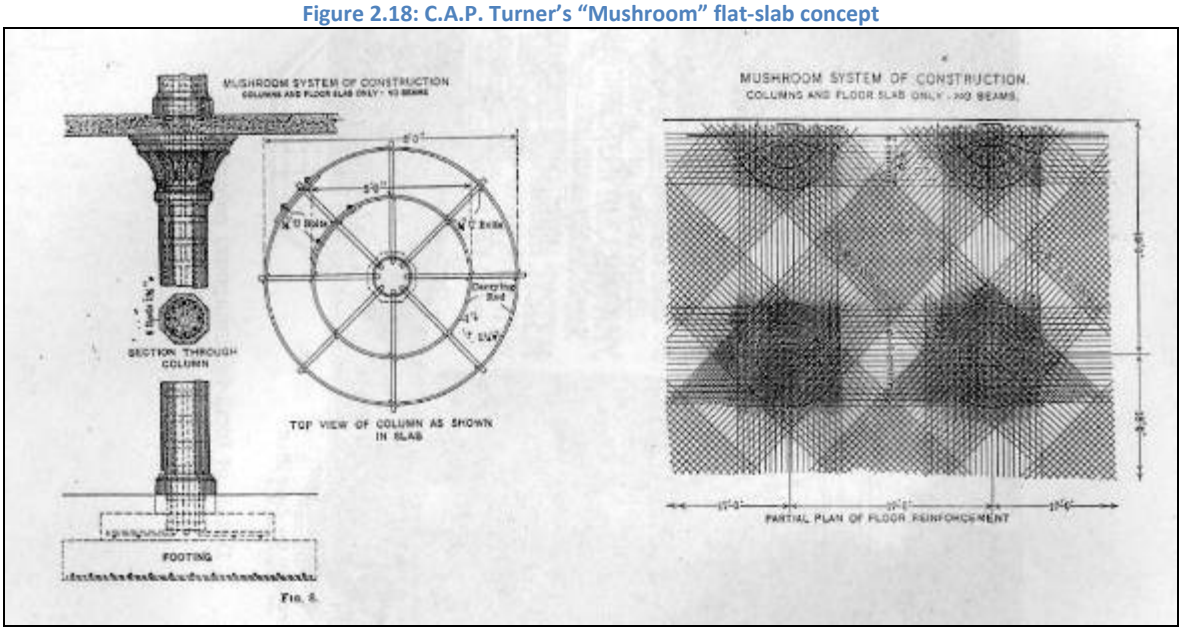


2009

Figure 2.17: Mushroom Capital Columns at 500 N. 3rd St.

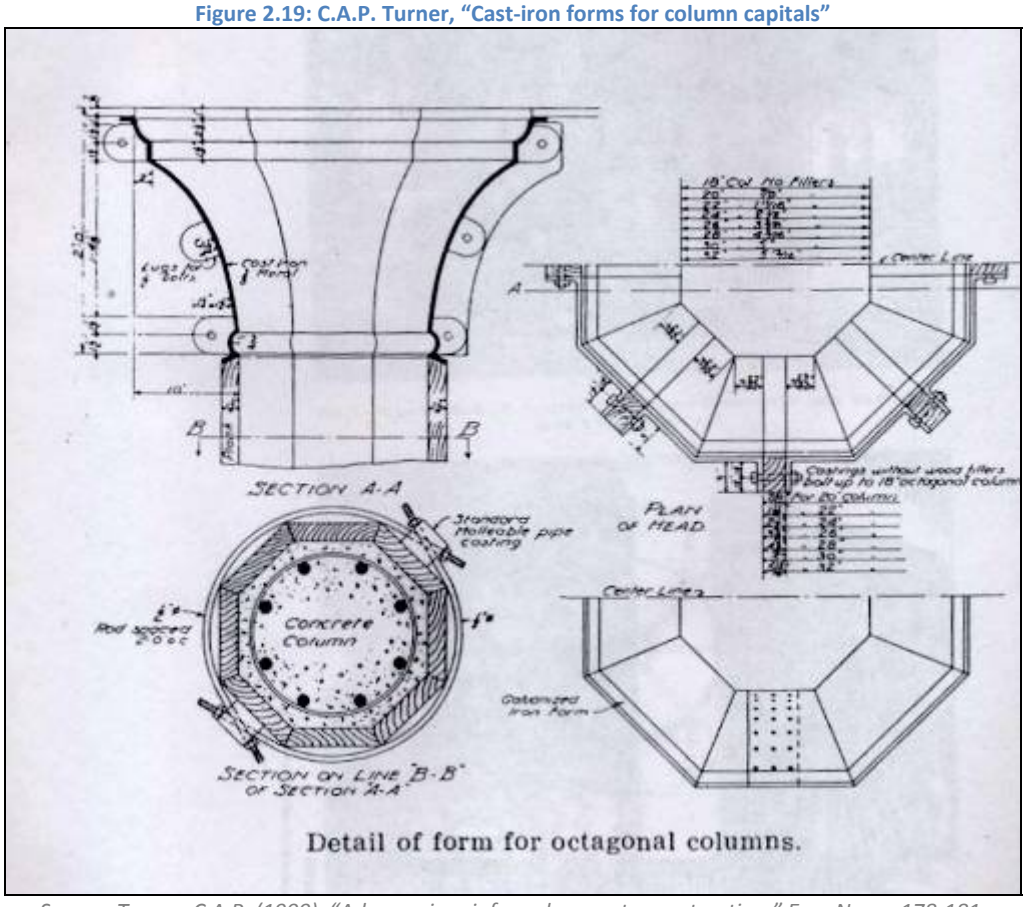
2009

Figure 2.18: C.A.P. Turner's "Mushroom" flat-slab concept



Source: Turner, C.A.P. (1905). Engineering News, October 12, 383-384

Figure 2.19: C.A.P. Turner, "Cast-iron forms for column capitals"



Source: Turner, C.A.P. (1909). "Advance in reinforced concrete construction." Eng. News, 178-181.

3 Historic Significance

The Green & DeLaittre Company Wholesale Grocery Warehouse is an early example of Claude Allen Porter (C.A.P.) Turner's 'Mushroom System' for reinforced concrete flat-slab construction, which had significant impacts for structural designs and construction methods during the first decades of the 20th century. C.AP. Turner's designs in reinforced concrete were internationally renowned. The building at 500 North 3rd Street in the Minneapolis Warehouse District is an important artifact as the earliest known extant example of C.A.P. Turner's Mushroom System in Minneapolis, where he lived and worked as an engineer for 35 years. Though the external appearance of the Green & DeLaittre Grocery Warehouse does not reveal its innovative structural composition, the original mushroom capital columns are intact and indicate an early experimental design for flat-slab construction. Turner's Mushroom System made it possible to construct structurally sound buildings with improved fire resistance, more natural light, and increased usable space- all at a lower cost.

3.1 Innovations in Reinforced Concrete Construction:

Prior to the invention of reinforced concrete as a building material, wood, iron and steel were most commonly used as structural supports in bridges and buildings. Though concrete, a synthetic material made of sand, gravel, cement, and water, had been experimented with for centuries, the invention of Portland cement as an imitation stone in 1824 sparked its widespread use for columns, floor spans, and vaulting.[2]

Reinforced-concrete construction, introduced in the early twentieth century, provided additional strength by reinforcing concrete (which has compressive strength) with steel bars, rods, or wires (which have tensile strength) that are embedded in the concrete. Early reinforced-concrete construction employed thick steel and concrete beams which were not only expensive but also occupied almost as much interior space as heavy-timber construction.[3]

The invention of reinforced concrete had immense design ramifications during the onset of the Modern Movement in Architecture at the beginning of the 20th century. The material and structural capabilities of reinforced concrete facilitated a type of design that would not otherwise have been possible using the existing materials of steel, stone and timber. Concrete's primary point of deviation from the design and structural attributes of steel and timber lay in its monolithic and plastic nature, versus the modular nature of steel and timber. Whereas steel design required repetition, reinforced concrete could be sculptural and freeform. The adoption of reinforced concrete into the mentality of modern conceptual design allowed for former "visionary" styles of architecture to become realizable.[4]

3.2 Claude Allen Porter (C.A.P.) Turner (1869 - 1955)

3.2.1 Early Work

During the first decade of the twentieth century, engineers experimented with reinforced concrete as a new building material; however it was Claude Allen Porter (C.A.P.) Turner of Minneapolis who was international renowned for developing a new method for flat slab construction which revolutionized building design and construction practices.[5]

Figure 3.1: Aerial Ferry Bridge in Duluth, MN, 1911

Courtesy of the MN Historical Society, Photo by Edward Albert Fairbrother

Turner was born in Lincoln, Rhode Island in 1869 and graduated from Lehigh University with a degree in engineering in 1890. After finishing school he worked for a number of engineering firms across the country before arriving in Minneapolis, including the Edgemore Bridge Company (Wilmington, Delaware), Columbus Bridge Company (Columbus, Ohio), Pittsburgh Bridge Company (Pittsburgh, Pennsylvania), Berlin Iron Bridge Company (East Berlin, Connecticut), and Pottsville Iron and Steel Company (Pottsville, Pennsylvania). In Minneapolis he worked for the Gillette-Herzog Company (later American Bridge Company) before creating his own company in 1901.[6]

Figure 3.2: Northwestern Knitting Co. Warehouse, 1905

Photo courtesy of the Minnesota Historical Society, ca. 1905 by Hibbard and Potter

As an independent consultant, Turner had success designing both bridges and buildings. An early commission which earned him national attention was the aerial transporter or ferry bridge built across the ship canal in Duluth, Minnesota in 1904 (Figure 3.1). It was constructed using the cantilever method and had a span of 394 feet that featured a "stiff traveler" car to carry people across the canal. The ferry bridge was the first of its kind in the United States (though popular in France) and Turner received a U.S. patent for some of its design features.[7]

Also in 1904 Turner designed Minneapolis' first building made entirely of reinforced concrete (Figure 3.2). He worked as a consulting engineer with the architects of Bertrand and Chamberlain for a plan for the Northwestern Knitting Company (now International Market Square) warehouse building number four. The building received considerable media attention. An article from the *Minneapolis Tribune* featuring the warehouse boasted that benefits of using

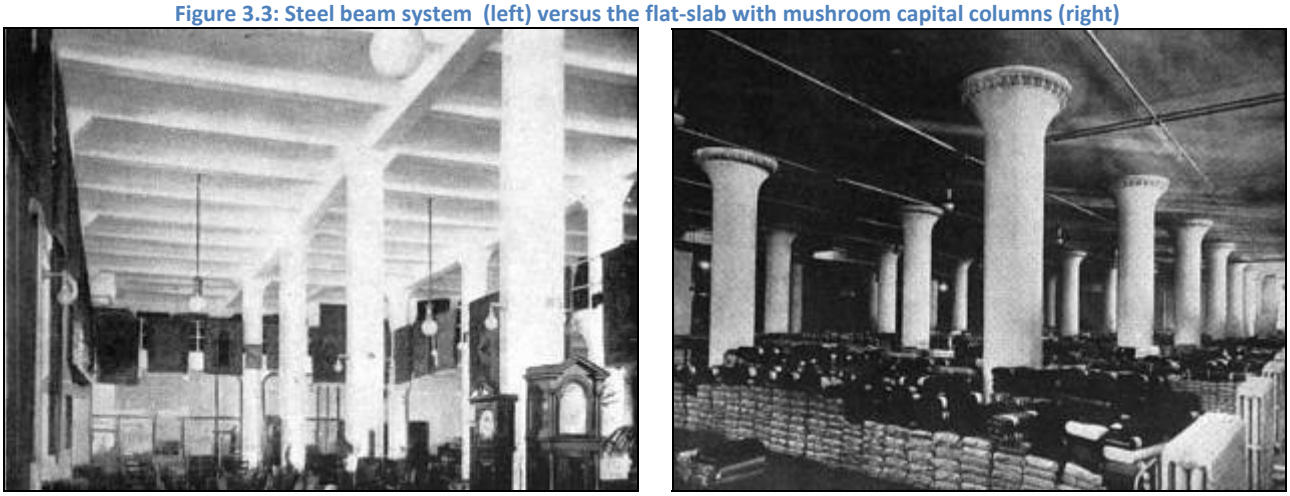
concrete were "that it is considerably more economical than the protected steel frame, while fully as strong and, and thoroughly fireproof." To demonstrate the warehouse's strength, the article reported that the building, "could be filled on every floor with sand up to the ceiling and still have strength to spare."[8] The buildings designed for the Northwestern Knitting Company, as well as the Minneapolis Paper Company (1905), used a beam system more in keeping with traditional design. These building were important precursors to Turner's innovations with flat-slab technology.

Turner was a member of the American Society of Civil Engineers, a member of the Society for Promotion of Engineering Education, and a member of the Engineering Council's Committee for Patent Reform.[9] He eventually moved from Minneapolis to Columbus, Ohio in 1936 and died there in 1955.[10]

3.2.2 'Mushroom System' of Reinforced Concrete Flat-Slab Construction:

Turner unveiled his concept for a flat-slab structural system in a study that was published in *Engineering News* on October 12, 1905.[11] Unlike earlier reinforced concrete construction that employed thick steel and concrete beams for additional load bearing support, Turner's design eliminated the need for beams by replacing them with load bearing columns (Figure 3.3).

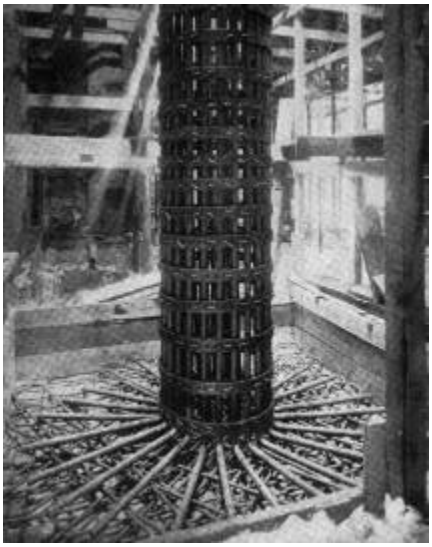
Figure 3.3: Steel beam system (left) versus the flat-slab with mushroom capital columns (right)



Source: Turner and Eddy, 1919, pg. 49, 52

These columns came to be known as the 'Mushroom System', though not for the flaring capital at the top of the column, but for the shear head which was shaped like a shallow truncated cone concealed in the concrete slab.[12] Reinforcing rods extended both directly and diagonally between the columns. Additional reinforcing hoops were laid on the radial rods (Figure 2.18 and Figure 2.19). The benefits of the unique, load-bearing design of the columns not only allowed for maximum support but had additional benefits including:

Figure 3.4: Reinforcement of concrete with steel radial rods



Turner and Eddy, 1919, pg. 319

- *Improved fire protection*: Beams and girders interfere with the flow of water from overhead sprinklers and limit their coverage area in the case of a fire. Fewer sprinklers on a flat-slab ceiling, supported by mushroom capital columns, are necessary to protect the entire area more effectively.
- *Provided better illumination from windows*: The flat-slab floor and columns were the only structural elements, therefore 80 percent the wall was left free for windows, providing a light airy interior.
- *More advantageous placing of shafts and other floor openings*
- *Increased usable space*
- *Reduced time and cost:* Steel beams were expensive, time consuming and dangerous to install. Their replacement with the flat-slab Mushroom System reduced the cost by eliminating material, shipping and construction costs and sped the progress of floor framing.

The first building to use C.A.P. Turner's flat-slab design was the Johnson-Bovey building, formerly located 426 2nd Avenue North, in Minneapolis in 1906 (non-extant). He described it in the October 1906 issue of *Engineering News* that, "In applying for a permit for this building, the building department refused to grant one, except for an experimental building, it being agreed and understood between the owner, the engineer and the contractor that the construction should stand a test load of 700 lob/ft.2 of floor, with a maximum deflection of 5/8 of an inch in the center of the slab." When the test load was applied, "the elastic deflection was a scant quarter of an inch."[13]

That same year, 1906, Turner was contracted by a Milwaukee firm to design a warehouse for John Hoffmann and Sons Company using the Mushroom System. After reading Turner's article in Engineering News and witnessing the test load for the Johnson-Bovey building, the owner and engineer of the Hoffman building was convinced of the concrete innovation. The Hoffman (now the Marshall) building, Turner's second flat slab building, is the earliest extant example of Turner's flat-slab Mushroom System.[14] It is an integral part of Milwaukee's Historic Third Ward Warehouse District and is a National Engineering Landmark.

Figure 3.5: Test Load at the Minneapolis Paper Company Building, 1905

Turner and Eddy, 1919, pg. 64

News of C.A.P. Turner's 'Mushroom System' spread rapidly across the country, in large part due to his own efforts to publicize and market the new technology. In addition to being a regular contributor to *Engineering News*, he published a series of bulletins that advertised his work using client testimonials and photographs of test loads (Figure 3.5).[15] In 1907, Turner claimed that there was 125 acres of building floor built with his 'Mushroom System'. His marketing strategy seemed to have worked so well that by the February 1909 issue of *Engineering News*, Turner could claim, "…the writer has been association in the erection of over 400 acres of floor built without ribs or beams, scattered from Portland, ME, to Portland, OR, in the United States and from Regina, Saskatchewan, in the north to Melbourne, Australia, in the south."[16] In short, between 1905 when he first introduced his theory to 1910, concrete buildings with flat-slab floors had become commonplace in the United States due to the efforts of C.A.P. Turner (Figure 3.6). By 1913 the process was used in over 1,000 buildings throughout the world.[17]

The number of buildings constructed using C.AP. Turner's 'Mushroom System' is difficult to quantify due to the nature of his consulting business. In 1913, Henry T. Eddy published an article "The Theory of Flexure and Strength of Rectangular Flat Plates Applied to Reinforce Concrete Floor Slabs." In his article he included a "List of One Hundred Buildings Selected from the More Than A Thousand Designed in the Mushroom System." The following is a partial list that Gasparini published in his 2002 article "*Contributions of C.A.P. Turner to Development of Reinforced Concrete Flat Slabs, 1905-1909*." The list is based on Eddy's 1913 list of buildings constructed prior to 1910 (Figure 3.6).

Figure 3.6: Partial List of Mushroom System Building Constructed Prior to 1910[18]		
1906	Johnson Bovey Co. Bldg	Minneapolis, MN
1906	Hoffman/Marshall Bldg	Milwaukee, WI
1907	Bostwick Braun Co. Bldg	Toledo, OH
1907	Lindeke Warner Bldg	St. Paul, MN
1907	Hamm Brewery Bldg	St. Paul, MN
1907	Smythe Bldg	Wichita, KA
1907	Forman Ford Bldg	Minneapolis, MN
1907	Grellet Collins Bldg	Philadelphia, PA
1907	Parsons Scoville Bldg	Evansville, IN
1907	Born Bldg	Chicago, IL
1907	Ziegler Bldg	Milwaukee, WI
1908	South Dakota State Capital	Pierre, SD
1908	Merchants Ice & Cold Storage Bldg	Cincinnati, OH
1908	St. Mary's Hospital	Kansas City, MO
1908	John Deere Plow Co.	Omaha, NE
1908	Minnesota State Prison (6 bldgs)	Stillwater, MN
1908	Ripley Apartments	Tacoma, WA
1908	Velie Motor Bldg	Moline, IL
1908	Park Grant Morris Bldg	Fargo, ND
1909	Con P. Curran Bldg	St. Louis, MO
1909	Manchester Biscuit Co. Bldg	Fargo, ND
1909	Blue Line Transfer & Storage Bldg	Des Moines, IA
1909	Cutler Hardware Bldg	Waterloo, IA
1909	Massachusetts Cotton Mills	Boston, MA
1909	McMillan Packing Co. Bldg	St. Paul, MN
1909	Vancouver Ice and Cold Storage Co.	Vancouver, Bldg
1909	Omaha Fireproof Storage Bldg	Omaha, NE
1909	J.J. Case Bldg	Oklahoma City, OK
1909	Tibbs Hutchings & Co. Bldg	Minneapolis, MN
1909	Snead Manufacturing Bldg	Louisville, KY
1909	New England Sanitary Bakery Bldg	Decatur, IL
1909	International Harvester Bldg	Milwaukee, WI
1909	Congress Candy Co. Bldg	Grand Forks, ND
Source: Eddy, 1913; Gasparini 2002		

Though he was best known for his work in flat-slab reinforced concrete construction, C.A.P. Turner accrued over 30 patents for various methods of reinforcement and types of centers for reinforced concrete construction.[19] Despite his patent for the 'Mushroom System' which he applied for in 1907 but did not receive until in February 1911, he was engaged in prolonged legal battles over his flat-slab mushroom capital construction. Beginning in late 1914 and extending to 1916, courts handed down a series of judgments against Turner, claiming that his approaches infringed upon an earlier patent; later understanding of the theory behind Turner's work disproves the reasoning for the judgments.[20] Still, C.A.P. Turner has won enduring acclaim from the engineering community for his advancements in the field.

3.2.3 Early Works in Minneapolis Attributed to C.A.P. Turner

C.A.P. Turner worked as an engineer based in Minneapolis for 35 years, consulting on projects throughout the world. Due to the consulting nature of his business, Turner does not appear on the building permits for every project he was involved with –the architects and contractors typically do. The following list of his early works in Minneapolis was compiled by consulting previously published lists of Turner's work, his own promotional bulletins, Minneapolis Tribune listings and Minneapolis Building Permit records.

Figure 3.7: Earliest Known C.A.P. Turner Projects in Minneapolis

Date	Name	Address	Extant	Mushroom System	Attributed to CAP Turner by:	Architect
1904	Northwestern Knitting Company	275 Market Street	Yes	No	Eddy, 1913	Bertrand & Chamberlain
1905	Minneapolis Paper Company	400-404 5th Street	No	No	Turner's Bulletin No 11 (pictorial reference)	Bertrand & Chamberlain
1906	Johnson-Bovey Building	426-432 2nd Avenue North	No	Yes	Eddy, 1913 and Building permits	CAP Turner
1907	Forman Ford Building	111-123 South 2nd Street	No	Yes	Eddy, 1913	A.L. Dorr
1907	Wisconsin Central Freight Station	10 Hennepin Avenue	No	Yes	Eddy, 1913 and Buiding Permits	G.H. Liepold & CAP Turner
1908	Green & DeLaittre Grocery Warehouse	500 North Third Street	Yes	Yes	Building permits	CAP Turner
1908	Fairmont Hotel/Apartments (Chambers Hotel)	901-903 Hennepin Avenue	Yes (additional floor added in 2007)	Yes	Mattson Macdonald Young Structural Engineers ca.2007	A.L. Dorr
1909	Tibbs Hutchings & Co. Building (Fur-Tex Building)	123-129 3rd Street North	Yes	Yes	Eddy, 1913	Long, Lamoreaux and Long
1909/ 1910	Cameron Transfer & Storage	756 4th Street North	Yes	Yes	Building Permits	CAP Turner

3.3 The Green & DeLaittre Warehouse at 500 North 3rd Street

The warehouse building C.A.P. Turner designed in 1908 for the Green & DeLaittre Wholesale Grocers is the earliest intact example of the Flat Slab Mushroom System in Minneapolis. Turner listed on the building permit along with J.M. McGuire as the architect for the building. The contractor was James Leck and Company, a contractor that worked on many of C.A.P. Turner's designs.

The National Register of Historic Places Nomination Form (1989) suggests that modest size of the building and the closely-spaced columns suggests an experimental design. However, the bay dimensions of 16 feet by 15 feet 6 inches appear to be in keeping with the typical bay dimensions of C.A.P. Turner's work between 1906 and 1909 as evidenced by the D. A. Gasparini's article "Contribution of C.A.P. Turner to Development of Reinforced Concrete Flat Slabs 1905-1909." The building at 500 North Third Street was constructed one year after Turner filed for his patent for the flat-slab mushroom capital design at a time of great expansion of his system for reinforced concrete construction.

3.4 The Business: Green & DeLaittre Importers and Wholesale Grocers

The Green & DeLaittre Company was one of the largest wholesale grocery firms in Minneapolis.[21] Earliest records of the company are found from 1901 when T.H. Green and Karl DeLaittre opened their business in a warehouse at 117-121 Second Street South (non extant).[22] The company moved later that year to a warehouse at 18-22 Third Street North, in the heart of the developing warehouse district (non-extant) (Figure 3.8). Green & DeLaittre operated at that location until commissioning C.A.P. Turner to design a new warehouse at 500 North Third Street in 1908.

Figure 3.8: Green & DeLaittre Grocery at 18-22 3rd St. N. – second building on the right side of street

Courtesy of the MN Historical Society, 1904

The Green & DeLaittre Company was typical of the growth in Minneapolis of warehousing and jobbing in the late nineteenth and early twentieth centuries. While the city had previously been considered a hub of manufacturing, access to markets via an extensive railroad system prompted the expansion in wholesaling industries as well. This, along with significant

population growth in the Twin Cities, drove wholesaling to grow from a $5.3 million industry in 1876 to $280 million in 1907 and to $1 billion in 1919.[23]

The Green & DeLaittre Company ran advertisements in local newspapers averaging once per week from 1903 until 1921, always in a position beneath their competitor, the George Newell Company. In 1912, they began advertising particular brands in their advertisements, particularly Princess Coffee. As the market was becoming more competitive in wholesale grocery, companies needed to differentiate themselves from their rivals and this was most often accomplished by advertising unique products. Along with Princess Coffee, Green & DeLaittre featured themselves as the "Sole Distributors" of Purity Rolled Oats to gain a competitive advantage.

In 1921, the company was absorbed by the Western Grocery Company, a regional grocery conglomerate with 13 branches in Iowa, Minnesota, Missouri, and Kansas. After the merger, operations continued at 500 North Third Street under the name of Western Grocery until 1948.[24]

3.5 The Owners: T.H. Green and Karl DeLaittre

T.H. Green and Karl DeLaittre shared the titles of vice-president for the Green & DeLaittre Grocery Company. While little could be found regarding the life of T.H. Green, he lived in Sioux City, Iowa before arriving in the Twin Cities. He was heavily involved in the National Association of Credit Men (now National Association of Credit Management), and was even the association's first treasurer when it began in 1896.[25] The association promoted laws to protect businesses against fraudulent debtors, improve the interchange of credit information, develop better credit practices and methods, and establish a code of ethics.

Green joined with Karl DeLaittre in 1901 to form a grocery wholesaling company. Karl DeLaittre came from a prominent Minneapolis family that played leading roles in the city's lumber, industry, politics, banking, and philanthropy during the late nineteenth and twentieth centuries. Karl's father, John, arrived in Minneapolis in 1865 and went on to become Minneapolis' 10th mayor (April 1877–April 1878), State Prison Inspector (1879-1887), and the commissioner of construction for the State Capital and the Minneapolis City Hall & Court House in 1900.

Karl DeLaittre (1874-1957) was part owner of the Green & DeLaittre Company Wholesale Grocery business. Additionally, he was a banker, a state representative (1905-1906), and a City of Minneapolis council member.

Karl's son, John (1907-1992), was also in the banking business and served as the president of the Farmers & Mechanics Savings Bank and the National Association of Mutual Savings Bank. In the 1960s John was appointed by President Kennedy to serve on the Federal Home Loan Bank Board; he served four years.

Neither T.H. Green or Karl DeLaittre are associated with Minneapolis landmarks, however Karl's son John is for his role with the Farmers & Mechanics Savings Bank.

4 Minneapolis Preservation

The City of Minneapolis designates properties that represent and reflect elements of the city's culture, social, economic, religious, political, architectural, or aesthetic history as local heritage landmarks. As of 2009, nearly 150 individual properties are designated as landmarks. Outlined in section 599.200 of the Minneapolis Code of Ordinances, designation acts as a form of protection against demolition or drastic alterations for these significant places.

The Green & DeLaittre Wholesale Grocery Company Warehouse is eligible for landmark status under two of the designation criteria outlined in section 599.210 of the Minneapolis Code of Ordinances.

4.1 Heritage Preservation Ordinance

Local Criterion 4: The property embodies the distinctive characteristics of an architectural or engineering type or style, or method of construction.

Built in 1908, the Green & DeLaittre Wholesale Grocery building is the earliest known extant example in Minneapolis of the 'Mushroom System' of reinforced concrete flat-slab construction. The engineer, C.A.P. Turner, received national and international recognition for his contributions to reinforced concrete. Turner's experimental designs using the 'Mushroom System' of load-bearing reinforced concrete columns made it possible to design buildings that improved fire resistance, provided more natural light, and increased usable space, among other benefits.

C.A.P. Turner's innovations in reinforced concrete flat-slab construction have been recognized nationally. In 2002, Turner's Marshall Building (1907) in Milwaukee was dedicated as a National Civil Engineering Landmark for being the earliest extant example in the country of Turner's flat-slab designs.[26] The so-called 'Turner System' is also an important component of the significance of Frank Lloyd Wright's 1939 Johnson Wax Administrative Building which is a National Historic Landmark (Figure 4.1).[27]

Figure 4.1: S.C. Johnson Company Administrative Building & Research Tower by Frank Lloyd Wright using load bearing mushroom columns

Photo from www.american-architecture.info/, date unknown

Locally, an example of the 'Turner System/Mushroom System' has not been preserved as an individual Minneapolis heritage landmark for its engineering significance. There are, however, several landmarks significant for, among other things, the distinctive or innovative use of concrete as a building material, including those shown in Figure 4.2:

Figure 4.2: Minneapolis landmarks distinctive for the innovate use of concrete

Concrete Block Rowhouse – 1885

300-314 ½ 26th Avenue North

Significant as an early use of concrete blocks as an artistic architectural material.[28]

Photo courtesy of Minneapolis Planning Department, 2006

Franklin Avenue Bridge/Cappelin Memorial Bridge – 1919-1923

Franklin Ave at the Mississippi River

Significant for incorporating the longest concrete arch in the world into its design at the time of its construction.[29]

Photo Courtesy of the Minnesota Historical Society, ca. 1923 by Charles J. Hibbard

Northwestern Knitting Co. Warehouse/ International Market Square – 1904

718 Glenwood/Western Avenue

Significant as Minneapolis' first building made entirely of reinforced concrete. Designed by C.A.P. Turner.[30]

Photo courtesy of the Minnesota Historical Society, ca. 1905 by Hibbard and Potter

Washburn Park Water Tower – 1931-1931

401 Prospect Avenue

Significant as an example of the Hewett System, named after prominent local engineer, William S. Hewett.[31]

Photo courtesy of the Minnesota Historical Society, 1951 by Ver Keljik

Concrete Block Houses (#1-8) – ca. 1885

Between 3rd and 4th Sts. and 26th Ave N

Significant as an early use of concrete block as an artistic architectural material.[32]

Photo of 2617 3rd St. N, courtesy of the National Register of Historic Places Inventory Form, 1984

In addition to those listed above for innovative uses of concrete, only a few Minneapolis landmarks are significant under designation criterion four for distinctive engineering. They include: the Grain Exchange (400-412 4th St. S.) as one of the first buildings in Minneapolis to make use of a steel frame for the internal structure,[33] and the Sharei Zedeck Synagogue (1119 Morgan Ave. N.) for the early use of structural glued laminated timber arches which were widely used beginning in the 1950s.[34] Additionally, the Stone Arch Bridge crossing the Mississippi River in the St. Anthony Falls Historic District is a National Engineering Landmark.[35]

Local Criterion 6: The property exemplifies works of master builders, engineers, designers, artists, craftsmen, or architects.

The Green & DeLaittre Grocery Warehouse is significant under criterion six for its association with Minneapolis' C.A.P. Turner whose 'Mushroom System' for reinforced concrete flat slab construction had national and international impacts. His advancements enabled buildings to be constructed with ample structural support, but in less time, for less money, and with greater design versatility. By 1913, only seven years after it was first displayed, Turner's Mushroom System had been used in over 1000 buildings around the world, and today is commonplace.[36]

C.A.P. Turner's local accomplishments include the engineering rebuild of the Pillsbury A Mill in 1913 and the design for the Northwestern Knitting Company/International Market Square in 1904. The Pillsbury A Mill is one of only two National Historic Landmarks in Minneapolis and the Northwestern Knitting Company is a local landmark.[37,38] These buildings were built without the Turner System, however, the oldest of the Northwestern Knitting Company's buildings is the city's first entirely reinforced concrete structures and a predecessor of the Turner System.

The National Register Bulletin, "How to Apply the National Register Criteria for Evaluation" explains the qualifications a landmark must meet in order to be considered the "work of a master":

> *A master is a figure of generally recognized greatness in a field, a known craftsman of consummate skill, or an anonymous craftsman whose work is distinguishable from others by its characteristic style and quality. The property must express a particular phase in the development of the master's career, an aspect of his or her work, or a particular idea or theme in his or her craft.*[39]

While several master architects are recognized for their association with Minneapolis Heritage Landmarks, engineers are underrepresented. C.A.P. Turner stood among few prominent engineers in Minneapolis, and stands out as one with national significance. His work on the Green & DeLaittre Wholesale Grocery Warehouse is one of his earliest extant examples of the 'Mushroom System' in Minneapolis for which he gained national and international prominence.

4.2 The Minneapolis Plan for Sustainable Growth

The designation of the building at 500 North Third Street is supported by the Minneapolis Plan for Sustainable Growth. Policy 8.1 of the comprehensive plan provides the most guidance on this item and states the following: "Preserve, maintain, and designate districts, landmarks, and historic resources which serve as reminders of the city's architecture, history, and culture." C.A.P Turner was an internationally prominent engineer whose designs for flat slab concrete construction revolutionized construction technology and architecture throughout the world. The building at 500 North Third Street is his earliest extant example of this revolutionary mushroom capital flat slab system, which he first developed in Minneapolis.

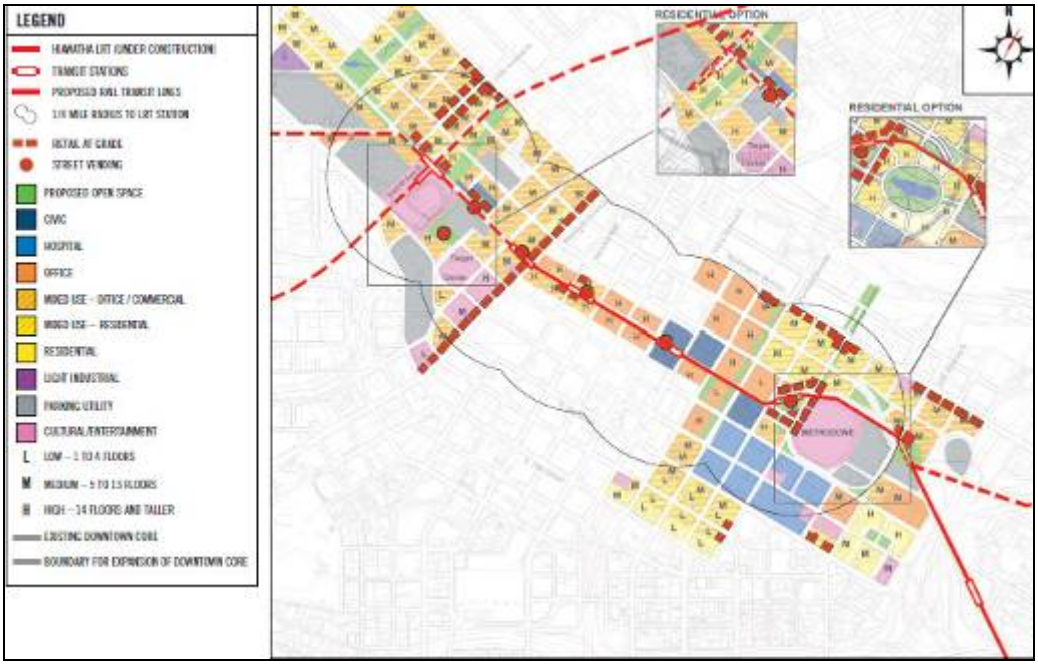
4.3 Downtown East/North Loop Master Plan

The Downtown East/North Loop Master Plan, adopted October 2003, provides land use and urban design recommendations for thirteen precincts or "complete communities" in the Downtown East and North Loop neighborhoods. The warehouse building at 500 North Third Street falls within the boundaries of the Warehouse West precinct where the following recommendations apply:

> "The historic warehouse structures in this precinct should be protected and preserved, with an emphasis on adaptive re-use of existing structures … Street level retail should also be encouraged to stretch along 5th Avenue North (Figure 4.3)to create a connection between Washington Avenue and the commercial node at, or near, the new multi-modal station and the proposed ballpark."[1]

Figure 4.3: Map of Recommended Land Use – At Grade Retail

[1] Since 2003, when the Downtown East/North Loop Master Plan was adopted, the multi-modal station has become a reality and the ballpark is set to open in April 2010.



Downtown East/North Loop Master Plan, 2003

4.4 Minneapolis Warehouse Historic District

The warehouse at 500 North Third Street is a contributing property to the Minneapolis Warehouse District, which is listed on the National Register of Historic places and is a locally designated historic district in Minneapolis. The historic district designation only addresses the exterior of the property and not interior elements including C.A.P. Turner's Mushroom System' of reinforced concrete flat-slab construction.

5 Historical Integrity

The historic integrity of a property is a measure of its authenticity and its present-day ability to convey its past significance. The City of Minneapolis and the National Register recognize a property's integrity through seven aspects of qualities: location, design, setting, materials, workmanship, feeling or association:[40]

1. *Location*: Location is the place where the historic property was constructed or the place where the historic event occurred. The Green & DeLaittre Grocery Warehouse maintains integrity of location because it remains where it was originally built.

2. *Design*: Design is the combination of elements that create the form, plan, space, structure, and style of a property. Very few modifications to the external design or, importantly, the internal flat-slab and mushroom cap columns construction have occurred, therefore, the property retains design integrity.

3. *Setting*: Setting is the physical environment of a historic property. While the function of the surrounding warehouse district has changed primarily to residential and office uses, the character of the neighborhood remains intact. The subject property, therefore, preserves its integrity of setting.

4. *Materials*: Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property. All original mushroom cap columns are still extant, supporting the flat-slab concrete floor system. Windows on the second through fourth floors are original, however, the first level openings have been in-filled. The exterior brick remains intact, as well as the concrete structural system. Therefore, the property retains its integrity of materials.

5. *Workmanship*: Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory. The Green & DeLaittre is an early example of nationally prominent engineer, C.A.P. Turner's "Mushroom System" for flat-slab construction. The building retains the workmanship of original structural system, including mushroom capital columns and therefore retains its integrity of workmanship.

6. *Feeling*: Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. Though the building is presently (2010) vacant, its aesthetic character matches that of the Warehouse Historic District which is representative of the growth of Minneapolis as a major manufacturing and warehousing center.

7. *Association*: Association is the direct link between an important historic event or person and a historic property. The Green & DeLaittre Grocery Warehouse is the earliest extant example in Minneapolis of the Mushroom System for reinforced concrete flat-slab construction by Minneapolis-based engineer, C.A.P. Turner. The building is significant for its association for the work of a master engineer, and the integrity of that association has remained intact.

6 Conclusion

The property at 500 North Third Street, the Green and DeLaittre Wholesale Grocery Company Warehouse, is significant for being earliest extant example of C.A.P. Turner's "Mushroom System" of flat-slab reinforced concrete construction in Minneapolis. C.A.P. Turner was a pioneer in the use of flat slab reinforced concrete construction and his designs had national and international impacts. His advancements enabled buildings to be constructed with ample structural support, but in less time, for less money, and with greater design versatility. The property retains all seven measures of historical integrity and meets two criteria for local designation.

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