

U. W. Milwaukee Geosciences 50th Anniversary Building Tour of Downtown Milwaukee

These notes are derived from the web page created by Nancy Hubbard (architecture), Tim Grundl and Bill Kean (Geosciences). The web page link is <http://people.uwm.edu/urban-geology/>. The site has more buildings and some more detail.

WALK 1 - BUILDING 4



Pfister Hotel

424 East Wisconsin Avenue

Architects: Henry C. Koch and Herman J. Esser 1892-1893

The Pfister Hotel is among the last buildings to use the local [Wauwatosa Limestone](#) in its construction. The production of Wauwatosa limestone for building stone declined after the mid-1890s for several reasons. The Depression of 1893 resulted in a sharp drop in construction activity for several years. By the time the economy rebounded, other building materials, such as brick and [Bedford \(Indiana\) Limestone](#), were available at lower prices. In addition, the style in architecture had changed significantly with the smoother finished and abundantly carved ornamentation of the [Beaux-Arts style](#) replacing the massiveness and rough finish of the [Richardsonian Romanesque](#) style.

[Wauwatosa Limestone](#): This dolomitic rock is most frequently referred to as limestone, in spite of its composition of calcium and magnesium carbonate. It is also known as Niagarian Dolomite, because it is the same rock unit that caps Niagara Falls in Western New York. It is used throughout eastern Wisconsin for buildings and roadwork because it is close to the surface and easy to quarry. It forms the prominent ridge that runs from Door County through Milwaukee and Waukesha and continues just below the surface through Racine and Chicago. It is middle Silurian age (450 million years old) and noted for the ancient coral reefs that are found in it. The reef structures provide clues to Wisconsin's past environment, suggesting that Wisconsin was once part of a shallow tropical ocean. The Milwaukee Public Museum has an exquisite diorama showing life on a Silurian reef. Fossils from quarries in S.E. Wisconsin can be viewed in the Greene Gallery on the UWM campus.

The rock tends to be light tan to gray in color and fairly compact or dense. This makes for an ideal building stone, especially since it is close to home.

WALK 1 - BUILDING 5



Milwaukee Club

706 North Jefferson Street

Architects: Edward Townsend Mix 1884

The [Queen Anne style](#) Milwaukee Club was constructed of Lake Superior Sandstone, red brick, and red terra cotta trim. [Lake Superior Sandstone](#) of the Milwaukee Club contrasts with the brownstone (brown sandstone) which Mix used for trim on Immanuel Presbyterian Church (1873) and on St. Paul's Episcopal Church (1883). Brownstone is a harder, more durable stone than Lake Superior sandstone. It is valuable to compare this building and the Button Block with St. Paul's Episcopal Church. The [Berea Sandstone](#) of the Milwaukee City Hall is also a valuable comparison.

Queen Anne style (1880-1900). This style is characterized by its variety of forms, materials, colors, and surfaces, as well as asymmetry and irregularity. Buildings have multiple, steeply-pitched roofs; towers or corners turrets, usually at the most prominent corner; tall, elaborate chimneys; and bay or oriel (rounded projections) windows. Typically, several materials, such as stone, brick, wood, metal, and terra cotta, may be used together on a building exterior.

[Lake Superior Sandstone](#): This sandstone that is mostly red or brown in color comes primarily from the Bayfield Group of sedimentary rocks that are found near Bayfield, Wisconsin and on the Apostle Islands in Lake Superior. The Bass Island Sandstone is one example. The sandstone of choice in this group is mostly a red feldspathic (has feldspar as a dominant mineral) sandstone deposited as the final stage of the infilling of the Keweenaw Rift. It is presently considered to be the last Precambrian event in Wisconsin which makes it about 1040 million years old.

WALK 1 - BUILDING 7



Northwestern National Insurance Company Building

526 East Wisconsin Avenue

Architects: Ferry & Clas 1904-1906

The building was designed in the [Beaux-Arts style](#), and constructed of smooth-faced [Bedford \(Indiana\) Limestone](#) from Bedford, Indiana.

Beaux-Arts style (1890-1920) *The Beaux-Arts style is characterized by the large scale of its decorative features and the richness of its detail, all derived from a classical architectural vocabulary of columns pediments, balustrades, statuary, medallions, and garlands. Typically, buildings have a tight, smooth surface broken by the projections of decorative features at openings and at the building roof.*

Bedford Limestone: *This sedimentary rock is formally known as the Salem Limestone, but also simply as Indiana Limestone. It is quarried in south central Indiana between Bloomington and Bedford. It was originally deposited in a warm shallow marine environment during Mississippian time (320-360 million years ago). The fine oolitic texture would suggest the sediments were subjected to wave action and marine currents sufficient to winnow the fossil fragments to a uniform size. If one looks closely at the stone you will see it is composed almost entirely of small fragments of marine shells. The Salem Limestone has been used extensively for buildings for over 100 years because of its uniform texture and ease of working. It is fairly soft and can easily be shaped with carving tools.*

WALK 1 - BUILDING 8





Wisconsin Gas Building

626 East Wisconsin Avenue

Architects: Eschweiler and Eschweiler 1929-1930

The 20-story is an excellent example of the setback [Art Deco](#) skyscraper. It was designed by the Milwaukee architectural firm, Eschweiler and Eschweiler.

The two-story base is made of [Morton Gneiss \(Rainbow Granite\)](#). The quarry has been in operation for over eighty years. In the 1920s, it was purchased by the Rockville Granite Company, the present Cold Spring Granite Company. The pinkish buff stone used for trim and ornamentation at the setback levels is [Mankato-Kasota Limestone](#), a Minnesota River valley limestone quarried north of Mankato, Minnesota..

Art Deco 1925-1940 (*Wisconsin Gas Building, 1929-1930*)

Art Deco is characterized by hard-edged, angular ornament that has a sharp, machine-like quality. Facades are usually arranged in a series of setbacks; this is especially true of Art Deco skyscrapers that set back from the base outline as the building rises vertically. Variations in color are often used to highlight the building form or ornamentation.

[Morton Gneiss \(Rainbow Granite\)](#): *This metamorphic rock is a migmatitic gneiss of Archaean age (about 3600 m.y.). This means that it is one of the oldest rocks that have ever been dated and is certainly the oldest rock in wide use as a decorative building material. It is quarried near the town of Morton, Minnesota. The primary minerals present in this rock are quartz, potassium feldspar (microcline), plagioclase feldspar and biotite. At one time this rock was very close to melting and the swirly, contorted banding that is so evident is due to plastic deformation near the melting point of the rock.*

[Mankato-Kasota Limestone](#): *This sedimentary rock is part of the Oneota Dolostone Formation of southern Minnesota. It is quarried near the town of Mankato, Minnesota. The age of this rock is*

~ 450-500 m.y. which places it in the lower Ordovician Period. The rock is a very fine-grained yellowish-tan dolostone consisting almost entirely of dolomite. The high dolomite content means that, for a sedimentary rock, it is relatively resistant to weathering and is therefore widely used as a building stone. The Oneota dolostone was laid down in a shallow embayment of an ancient Ordovician sea. It contains relatively few fossils and for this reason it has been suggested that this embayment was hypersaline and could not support a wide range of life forms.

WALK 1 – BUILDING 9



Northwestern Mutual Life Insurance Company Building 666

720 East Wisconsin Avenue

Architects: Marshall & Fox (Chicago) 1912

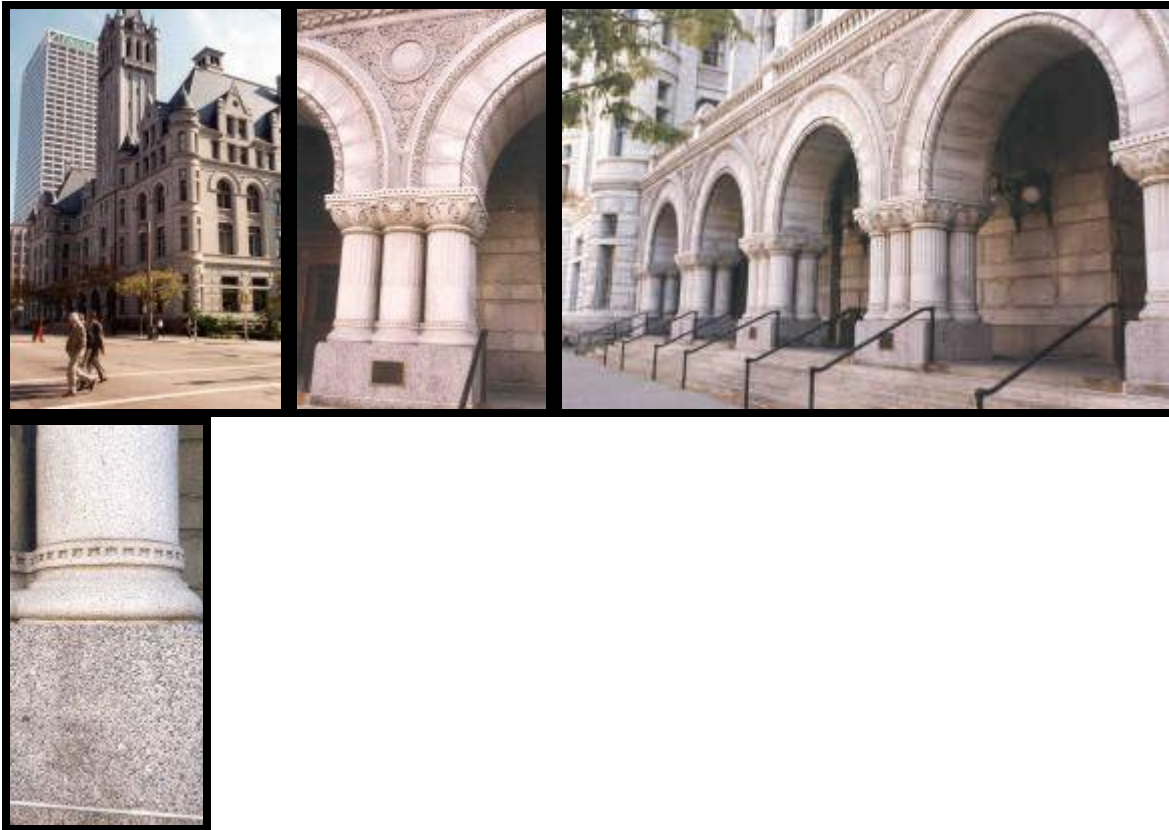
The facades of the [Neo-Classical Revival](#) building are dominated by 74' high Corinthian columns with elaborately carved capitals. The crispness of carved granite can be seen in these capitals.

Neo-Classical Revival 1900-1930 Usually, colossal porticos or colonnades are found on Neo-Classical Revival buildings. Buildings typically appear to have very low or flat roofs, and named for their reference to classic Greek architecture.

The almost-uniformly white granite of the exterior is the [Bethel White Granite](#) coming from quarries in Woodbury, Vermont

[Bethel White](#): This coarse grained igneous rock is a type of granitic rock that is specifically identified as a quartz monzonite. It is quarried near the town of Bethel, Vermont. The Vermont granitic rocks are much younger than the rest of the granitic rocks seen in this field trip. The age of this rock is ~335 m.y. which is Devonian

WALK 1 - BUILDING 6



Old Federal Building

515 East Wisconsin Avenue

Architects: Willoughby J. Edbrooke /James Knox Taylor 1892-99

The Old Federal Building is an excellent example of the [Richardsonian Romanesque](#) style that was often used for governmental buildings in the late 19th century. The granite used in the building is a mix of [Athelstane Granite](#) from Wisconsin at the base with fine grained gray granite from Maine (Mt Waldo) on the top. The addition (1930) in the back is made of course grained [Rockville White](#) granite from Rockville, Minnesota.

Richardsonian Romanesque (1870-1900) *Inspired by buildings designed by the Boston architect, Henry Hobson Richardson (1838-1886) in the 1870s and early 1880s, this style is characterized by heavy walls of rock-faced stone, openings set deep in the massive walls, large arches framing stacks of windows, and short heavy columns.*

Mt Waldo Granite: *This is the primary granite on the front of the building. It is from the northern Penobscot Bay region of Maine. The Mt Waldo Batholith is a late Devonian (~371 Ma) felsic pluton. It is considered a true granite because of the approximate equal proportions of quartz, alkali feldspar and plagioclase feldspar. (Gabriela Moroz 2021). Mt Waldo Granite has been used for many buildings on the east coast as well as the Midwest, such as U.S. Senate Office Building, Philadelphia Mint and buildings in the Midwest. The quarry ceased operations in 1914.*

Athelstane and Amberg Granites: *These granites come from nearby towns in northeastern Wisconsin, just south of the Michigan border. They have a variety of grain sizes. The Amberg tends to be more gray, whereas the Athelstane is more pink. They both formed as intrusive bodies of rock that formed the core or subsurface of volcanic islands some 1840-1890 million years ago, when northern Wisconsin looked more like the Japanese Islands do today. These granites were a few of many granites quarried in Wisconsin. In fact, Red Granite is the State rock. Today one can visit a small museum in Amberg, which documents the local quarry industry. You are encouraged to see some of the rock in its "natural" state at the Joe Davies County park just off Highway 141 near Amberg.*

Rockville White: *This coarse grained igneous rock is a true granite of Early Proterozoic age (~1730 m.y.). It is quarried near the town of Rockville, Minnesota. The main minerals evident in the rock are quartz, potassium feldspar (microcline), plagioclase feldspar, and biotite. Smaller amounts of zircon, apatite, hornblende, chlorite, sericite and sphene also occur. The texture is porphyritic with large crystals of potassium feldspars ("phenocrysts") set in an otherwise equigranular matrix. The rock is very chemically and petrologically very similar to Diamond Pink. The main difference is the absence of pink color in the feldspars.*

WALK 1 - BUILDING 3



(Before Renovation)

Northwestern Mutual Life Insurance Company

(Loyalty Building)

611 North Broadway

Architects: Solon S. Beman (Chicago) 1885

The [Richardsonian Romanesque](#) style of the building is seen in its massive arches and heavy stone masonry. The architect, Solon S. Beman (1853-1914), was a prominent Chicago architect, best known for his design of the planned industrial community of Pullman, Illinois (1879-80 to 1895), and numerous office buildings in Chicago. One of the most significant of his Chicago office buildings is the Fine Arts Building (1886), originally called the Studebaker Building, on South Michigan Avenue that is an eight-story load-bearing granite structure, done in the Richardsonian Romanesque style. Due to the strength of the granite used in that building, Beman was able to construct a stone structural frame that allowed extremely large windows, a highly desirable feature for lighting office spaces. This building has recently undergone renovation and is now the Hilton Garden hotel. Take a peek inside to see an excellent interior with some spectacular fossiliferous marble!

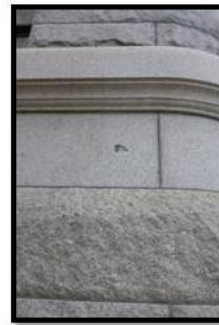
Beman selected two medium-grain gray granites from Maine, the [Hallowell and Fox Island Granites](#), for the lower parts of the building exterior. Fox Island granite came from Vinalhaven Island, the southern of two islands in Penobscot Bay that together are called the Fox Islands.

First opened in 1826, and operating through the late 19th century, the quarries on Vinalhaven Island were among the leading suppliers of New England granites. Fox Island granite was used for construction of the Brooklyn Bridge (John and Washington Roebling; 1869-1883) and the Boston Museum of Fine Arts (Guy Lowell; 1907-1909). The granite quarries at Hallowell were found on the west side of the Kennebec River, just south of Augusta, the state capital. Hallowell granite was used in the construction of the Maine state capitol in 1832, of which Charles Bulfinch of Boston was the architect.

The upper façade is again Bedford Limestone (Indiana Limestone), which has become quite gray with age.

Hallowell and Fox Island Granite:The Hallowell Granite is a coarse-grained igneous rock that is primarily a biotite-muscovite granite. It was quarried in the town of Hallowell, Maine near the banks of the Kennebec River. The rock crystallized 380-390 m.y. ago, which places it in the middle Devonian. The main minerals evident in the rock are white orthoclase feldspar, quartz, biotite and muscovite. The overall color is very white with a uniformly fine-grained texture. The Fox Island Granite is a very similar rock quarried on the Fox Island near the mouth of the Sheepscot River.

Loyalty Building now Hilton Gardens



(After Renovation, Completed Fall 2012)

Chamber of Commerce Building (Grain Exchange)

225 E. Michigan St.

Edward T. Mix (1879-80)

Victorian Commerce Building

Base is rusticated granite (source unknown), The top is gray Berea sandstone from Ohio



Building next door

Mitchell Building

207 E. Michigan

Edward T. Mix (1876)

Second Empire, Mansard Roof

Base is granite (probably the same as Grain Exchange), and the top is gray Berea Sandstone, the roof has slate shingles.

Walk 1 Building 2



State Bank of Wisconsin/Bank of Milwaukee

(Insurance Exchange Building)

210 East Michigan Avenue

Architects: Mygatt & Schmidtner (west: State Bank of Wisconsin) 1856
Albert Nash (Cincinnati) (east: Bank of Milwaukee) 1858

Originally built as two buildings in the 1850s, the buildings were both done in the (Italian) [Renaissance Revival](#) style. They have a load-bearing stone exterior with wood interior structure. In a 1903 project by Ferry and Clas, the two buildings were combined into one, and the original elaborate iron cornice was removed. In 1956, the two western-most bays of the buildings collapsed due to vibrations from street construction. The North Water Street facade was rebuilt in cream brick, and the Michigan Street facade was rebuilt with stone salvaged from the collapsed bays.

The stone used in construction of both buildings was a northeastern Illinois dolomite known as the [Joliet Limestone](#). The stone was a common material for the construction of buildings in Chicago, due to the expansion of quarrying operations in the Joliet-Lemont area, near Chicago, in the 1840s.

The original stone carvings on the buildings have been greatly affected by acid precipitation in the late 20th century. When deteriorated decorative carvings at the entrance were replaced in 1990, Kansas Cottonwood limestone was used for its higher quality and greater durability.

***Renaissance Revival** (1840-1890). Based on early 16th-century Italian precedents, buildings in this style are usually cubic in form with smooth, finely-cut ashlar (cut stone blocks) exteriors. The cubic form is often outlined with stacks of larger blocks at the corners, called quoins. Doors and windows typically are topped with elaborately-carved decorative lintels.*

[Joliet Limestone](#): This rock is another Silurian age building stone of the Midwest. Its primary source is a quarry in Batavia, Illinois, which is just west of Chicago near Aurora. The stone is also known as Joliet Marble and Athens Marble, although it is not marble. These other names indicate that similar rock was quarried in those nearby towns. It tends to weather to a buttery yellow color which is not true of Waukesha Dolomite quarried in Wisconsin.

WALK 2 - BUILDING 1



City Hall

200 East Wells Street

Architects: Henry C. Koch and Co. 1893-1896

The base of City Hall is constructed of striated [Berea Sandstone](#). The upper floors of the building are constructed of buff-orange pressed brick. The architectural style is Flemish revival

[Berea Sandstone](#): This sandstone comes primarily from north-central Ohio in the vicinity of Berea, near Cleveland. The sandstone is part of the Bedford-Berea sedimentary sequence, which extends from Pennsylvania to Kentucky. It is of Mississippian age, but slightly older than the Bedford Limestone. The quarry stone is thickly bedded and frequently shows depositional structures such as cross bedding, and current ripples. Its uniform texture over great thickness and ease of cutting into dimensional stone has made it a prized building material for over 100 years.

WALK 2 - BUILDING 6



Marcus Center for the Performing Arts

929 North Water Street

Architects: Harry Weese & Associates (Chicago) 1966-1969, Kahler Slater Torphy (with Robert Davis, New York), Engberg Anderson Design Partnership 1994-1997

The [Modernist](#) design of the Marcus Center is seen in the arrangement of interlocking cubes and a geometric pattern of rectangles and diamonds. Completed in 1969, the Marcus Center was originally clad in an Italian travertine marble. The MGIC Plaza across the street from the Marcus Center, was also done with travertine cladding. By the early 1990s, the travertine veneer on the Marcus Center had deteriorated beyond repair due to cracking and bending of the stone panels. The situation was similar to that of the Amoco Building in Chicago where the marble panels on the 80- story building were removed and replaced with granite in 1992.

In 1994, the Marcus Center travertine was replaced with two different stones. A lower course of [Diamond Beige Granite](#), is topped with exterior walls of [Winona Travertine](#), quarried near Winona, Minnesota.

***Modernist** (1950-1980). Modernist architecture is characterized by its lack of ornamentation and emphasis on geometric forms. Surfaces tend to be relatively flat and have an uniform color and texture.*

[Diamond Beige](#): This porphyritic igneous rock is a true granite of Early Proterozoic age (1700-1800 m.y.). It is quarried near the town of St. Cloud Minnesota. The main minerals evident in the rock are quartz, potassium feldspar, plagioclase feldspar, and biotite. Smaller amounts of zircon, apatite, hornblende, chlorite and sericite also occur. The potassium feldspars are the large crystals ("phenocrysts") set in an otherwise equi-granular matrix.

[Winona Travertine](#): This sedimentary rock is part of the Oneota Dolostone Formation of southern Minnesota and as such is essentially the same rock as the [Mankato-Kasota Limestone](#)

WALK 2 - BUILDING 5



1000 North Water Street Building

1000 North Water Street Building

Architects: Harwood K. Smith & Partners (Dallas) 1991

The steel frame of the 12-story building is clad in pinkish [Lac du Bonnet Granite](#), with a polished surface on the lower three floors and honed on the upper floors. The granite was quarried in Lac du Bonnet, Manitoba by the Cold Spring Granite Company. Windows are set flush with the granite skin, emphasizing the flatness of the building's facades. The windows have a pink tint which matches the color of the granite. The uniformity of surface and color combine to create a skin-like covering over the steel structural frame.

[Lac Du Bonnet:](#) This coarse grained igneous rock is a type of granitic rock that is specifically identified as a quartz monzonite. It is quarried near the town of Pinawa, Manitoba Canada. The rock crystallized 2700 m.y. ago, which places it in the Late Archaean. The main minerals evident in the rock are potassium feldspar, plagioclase feldspar, quartz, sericite, biotite, and muscovite. Smaller amounts of chlorite, epidote, zircon and apatite also occur. The presence of minerals such as sericite and chlorite indicate that the rock has undergone a phase of secondary alteration after it initially crystallized.

For those of you who are petrologists, this rock contains relatively high amounts of uranium and thorium. Being a quartz monzonite (or adamellite), the rock contains intermediate amounts of the alkali elements (sodium and potassium) and calcium. The extrusive equivalent is rhyodacite.

Red Arrow Park Monument

Across the street in Red Arrow Park is an example of **Wisconsin Red Granite** (Wausau Red). Red granite is the state rock.

Frank Zeidler Municipal Building 41 N. Broadway

Architect: Eschweiler and Eschweiler 1959, 10 story Modern style

Building Material is Wisconsin red Granite (Wausau Red) columns and at the street level on Broadway is Duluth or Mellen Gabbro. Wisconsin Rd granite is part of the 1830-1850 Ma granites in the state. Mellen and Duluth Gabbro are part of the Keewenaw rift sequence (~1000 Ma)