PRELIMINARY REPORT
November 16. 1998

HISTORIC DESIGNATION STUDY REPORT

SECTION I. NAME

Historic: Johnson Service Company Building

Common Name: Johnson Controls Inc. Building

SECTION II. LOCATION

507 E. Michigan Street

4th Aldermanic District
Alderman Paul Henningsen

Legal description: Tax Key No.: 392-0849-000-5

PLAT OF MILWAUKEE IN SECS (28-29-33)-7-22
BLOCK 24 LOTS 3 TO 12 INCL & S 225' OF VAC ALLEY BID #21

SECTION III. CLASSIFICATION

Structure

SECTION IV. OWNER

Mr. James Keyes
Chairman and Chief Executive Officer
Johnson Controls Inc.
Post Office Box 591
Milwaukee, WI 53201-0591

SECTION V. YEAR BUILT: 1902-03 (1923-24)

ARCHITECT: Herman J. Esser (1902)
Buemming and Guth (1923)

SECTION VI. PHYSICAL DESCRIPTION

The Johnson Service Company Building is located in the Central Business District of Milwaukee. The block upon which the building and its additions sit is bounded by E. Michigan, N. Jackson, E. Clybourn, and N. Jefferson Streets. The portion of the building which is currently under consideration is located at the southeast corner of the intersection of E. Michigan and N. Jefferson Streets. It was built in 1902-03 and was designed by local architect Herman Esser.

The Johnson Service Company Building is a 7-story rectangular, flat-roofed, factory and office building. It is clad in pressed red-brick (not local to Milwaukee). The building is sited to the lot lines. The main facade is on E. Michigan Street, although the secondary facade on N. Jefferson St. is longer. The first two floors are clearly defined by horizontal banding and the seventh floor, or attic, is ornately detailed with carved panels, carved limestone corbels, and an ornate cornice. Other notable refinements in architectural detailing include corner quoins and exclamatory ornamental window keystones. The window openings are grouped in a pattern of one window in each corner of every story and pairs of windows across the remainder of the first six floors. On the seventh floor, however, there are groups of three windows across both facades between the corner windows. The grouping of the windows is original to the extant structure, although the original double hung, one-over-one and two-over-two sash windows were replaced with ones of a modern design in the 1960's.

The main entrance to the building was originally located on the east side of the Michigan Street facade, although with the construction of a matching addition in 1924, the main entrance now occupies a central location on the Michigan Street facade. The arched opening of the main entry is framed stone *vouissoirs* and is surmounted by a stone name plaque spelling out "Johnson Service Company". There is a secondary entrance located at the south end of the Jefferson Street facade, framed in brick.

The 1902 structure was the first building on the block to be constructed using brick, let alone reinforced concrete. The block was largely comprised of residential frame structures until the introduction of the Johnson Service Company Building. In 1923, a matching addition was constructed on the east side of the original structure, and was designed by Buemming and Guth. Although the addition is identical in every respect to the original building, it was not possible to use the same pressed red brick, and at close range a difference in shade can be detected. To the south of the Johnson Service Company Building a 3-story reinforced concrete building was constructed in 1921 and addressed at 518-522 N. Jefferson. This was designed by renowned architecture firm Martin Tullgren & Sons., although it has since undergone significant alterations. Through the early 1940's that building housed the W.F. Mackie Co. and Nuzum Electrotype Co., before being acquired by Johnson Controls. To the east of the Johnson Service Company Building the Stroh Building, made from reinforced concrete and built in 1910, was located until its recent demolition. Johnson Controls bought the building and razed it, in order to construct a new building on the site. By the end of the 1950's other factory buildings had been added to the block by the Johnson Service Co. and others, although they do not match the building in question and are not the subject of this study. In the space of just over 50 years from the completion of the Johnson Service Company Building the block had been transformed from one of residential and commercial uses to one of industrial and manufacturing uses, with the Johnson Service Co. owning and occupying most of the block by the mid-1950's.

Aside from the modern replacement windows and the blocking up of the basement windows, the Johnson Service Company Building has retained its original architectural integrity.

SECTION VII. SIGNIFICANCE

The Johnson Service Company Building is significant as the first permanent headquarters, office facility, and manufacturing plant of the Johnson Service Company. The building served as the main office of the company until 1980, at which time Johnson Controls Inc. (renamed in 1974) was on the verge of becoming a billion dollar industry, and when the main offices moved elsewhere. Johnson Controls Inc. has contributed significantly to the economic development of the City of Milwaukee. Since it was incorporated in 1885 as the Johnson Electric Service Company, by Prof. Warren S.

Johnson and William Plankinton, the company expanded into international markets, with manufacturing plants and offices in numerous countries, and continues to be a worldwide leader in its field. Johnson Controls Inc. is currently Wisconsin's largest public company, with total revenues of more than $11 billion for the year 1997. Following Warren Johnson's 1883 patent for the electric tele-thermoscope, the company has developed and manufactured building control systems for commercial and industrial facilities. The Johnson Service Company Building was used to manufacture automobiles between 1902 and 1912, which made the company one of the earliest manufacturers and distributors of automobiles in the city. The company is today the fourth largest producer of original parts for automobiles in the Unites States. It must be recognized that Johnson Controls Inc., over the course of 112 years, has both defined and led the field in developing remote building control systems for large buildings.

The Johnson Service Company Building also significant for its association with the work of Warren S. Johnson, the founder of the company. Johnson was a prolific inventor, holding over 50 patents for devices aimed at harnessing the power derived from air, steam, or fluid pressure. His most significant invention, a system for regulating the temperature of large industrial and commercial facilities, remains as one of the fundamental functions of the current Johnson Controls Inc. In addition to this, Johnson designed pneumatic mechanisms for large clock towers in Minneapolis, Milwaukee and Philadelphia. He lived in Wisconsin for all but the first two years of his life, and took an active role in overseeing the construction of the Johnson Service Company Building.

The Johnson Service Company Building is also significant for its role in the development of reinforced concrete technology. Reinforced concrete, as a building material, was still a relatively recent innovation at the time of construction of the Johnson Service Company Building, particularly for use in large-scale office and manufacturing buildings. It is believed that this building was the first reinforced concrete office building in the city and was built contemporaneously with the Ingalls building in Cincinatti, which is credited as being the first tall office building to be entirely constructed from reinforced concrete. While the Johnson Service Company Building is not as tall as the Ingalls building it was constructed in the same manner, the Ransome system of reinforced concrete construction, and occupies a larger site area. Considerable attention was devoted to the construction of the Johnson building by experts in the field of reinforced concrete, building inspectors and the local press, because of a partial collapse of the half-finished structure in March 1903.

The Johnson Service Company Building is also significant as an important work of the local architect Herman J. Esser. He designed a number of large-scale structures which have contributed to the architectural character of the downtown area.

SECTION VIII. HISTORY

The Johnson Service Company Building has occupied a prominent position in downtown Milwaukee, at the corner of E. Michigan and N. Jefferson Streets, for nearly a century. It has been continuously occupied and was the first of a number of buildings constructed on this block by Johnson Controls Inc. over a period of fifty years. The history of this particular building is inextricably linked with the history of the rise of Johnson Controls Inc. to its current position as a successful international corporation, and with the history of its founder Warren S. Johnson as it was he who commissioned the building and oversaw its construction. It is also important to recognize the place which this building occupies in the history of reinforced concrete construction. Reinforced concrete has become a very common building material but it was regarded with some ambivalence at the time in which the Johnson Service Company building was constructed. Herman J. Esser, who designed the building, was a noted local architect whose work helped to define the downtown character of Milwaukee.

Warren S. Johnson (1847-1911) was the only child of a pioneer farmer who moved his family from Vermont to Waukesha, Wisconsin in 1849. Johnson's mother died when he was very young which, coupled with an inattentive and callous father, led him to become very self-reliant. He dabbled in inventing at a young age but, being far away from commercial centers and without financing, he could not realize any of his early efforts. Instead he became a country school teacher, then became County Surveyor of Dunn County, before accepting the position of County Superintendent of Schools of Juneau County. The final appointment accepted by Johnson was a Professorship of Science and Art at the State Normal School in Whitewater, Wisconsin. It was from this position that he took a renewed interest in inventing and set to work developing his mechanical ideas. The Normal School proved to be fertile ground for experimenting in

methods of controlling the temperature of large buildings.

In 1883, Professor Johnson patented a design for an electric tele-thermoscope, a type of thermostat in which changes in room temperature moved a thermal element into and out of a pool of mercury to open and close an electric circuit. He managed to persuade William Plankinton, son and heir of the wealthy packer John Plankinton, that this invention was worthy of financial backing. This led to the formation of the Milwaukee Electric Manufacturing Co. which enabled the Professor to resign his position at the Normal School. Plankinton brought the Professor to Milwaukee and set him up in a small shop behind the Davidson Theater. It was from these humble accommodations that the Professor continued his experiments with electric thermostats. In 1885, the Johnson Electric Service Co. was incorporated, and in which Professor Johnson and William Plankinton held an equal share. At this stage Plankinton was the president and Johnson was the vice-president and treasurer. Between 1885 and 1902 the business had three locations in downtown Milwaukee and it wasn't until the construction of the building in question that there was a permanent headquarters. One reason that the company kept moving is that the Johnson laboratory was prolific in inventing devices and launching new projects in rapid succession.

In 1900, Professor Johnson developed an interest in the possibilities of wireless communication and at the Paris World Fair of 1900 a wireless exhibit prepared by the Johnson firm took a silver medal; a competition in which Marconi took a bronze medal. Experiments with the telegraph continued for a number of years subsequently although without any notable successes. Warren Johnson was elected president of the company, in 1902, and the name was changed to the Johnson Service Co., dropping the word "Electric" from the title as the thermostat had become fully pneumatic by that stage. The company turned its attention to the automobile industry, and all of those automobiles produced by the Johnson Service Co. were steam-powered until 1907. This was an effort to diversify so that the company would not be over-reliant upon temperature regulation systems. The automobiles, mostly trucks designed for use by the U.S. Postal Service, were built without an assembly line, in the Johnson Service Company building. Between 1907 and 1912 gasoline-powered vehicles were produced by the company at the Michigan St. factory, although Professor Johnson became disillusioned with the reluctance of the company's backers to increase their support for the automobile enterprise.

Following the death of Professor Johnson, in 1911, the Johnson Service Co. leased a section of the building to the Globe Electric Co. instead of selling it, which had been the wish of the new president Harry Ellis. President Ellis did, however, sell the company's automobile and clock divisions and concentrated solely upon temperature control systems. It was not until the Second World War that the Johnson Service Co. would renew its efforts to diversify into other areas. Diversification took the Johnson Service Co. into the fields of defense, centralized controls, electronics, and the manufacture of parts for automobiles, thus ensuring that the company would remain true to its original charter which advised "to purchase inventions and patents for related devices and processes that would help further the corporation's interests".

In 1968, the Johnson Service Co. joined the ranks of the Fortune 500 with sales totalling $155 million. The company was renamed in 1974 as Johnson Controls Inc., which is its current title. The relationship of the Johnson Service Company with the Globe Electric Company, which began in 1912, was permanently cemented in a merger between Johnson Controls Inc. and Globe-Union (then the largest manufacturer of auto batteries in the United States). In 1981, Johnson Controls Inc. became a billion dollar industry and it is currently Wisconsin's largest public company with revenues totalling over $11 billion in 1997. Over the last century, Johnson Controls products have been placed in buildings across the world, including the Pentagon, the Los Angeles International Airport, the World Financial Center in New York City, all 57 of the Titan II launch complexes, and in instrumentation for the Apollo-Saturn program at NASA. The Sears Diehard battery is another well-known product.

The Johnson Service Company Building played an important part in the introduction of reinforced concrete construction to the city of Milwaukee. It also serves as an excellent example of the Ransome system of reinforced concrete construction, an early method of reinforced concrete construction which imitated the form of steel and timber buildings (columns, girders and joists), and was popular for just over 20 years. This preceded the method of reinforced concrete construction which relied solely upon a reinforced concrete floor slab supported by reinforced concrete columns, and which was developed initially by Orlando Norcross and later by C.A.P. Turner.

Reinforced concrete (also known as armored concrete, ferro-concrete, concrete steel and steel concrete until about 1910) is concrete strengthened by the use of another material; usually metal. The invention of this material is

usually attributed to a Parisian gardener, Joseph Monier (1832-1906), who made garden pots and tubs of concrete and reinforced them with a mesh of iron wire. He obtained his first patent for this system in 1867. In the United States the first major patent in reinforced concrete was granted to Thaddeus Hyatt (1816-1901), an inventor, in 1878. Hyatt recognized that the steel must have sufficient tensile strength to resist the compressive stresses in the concrete, although he was not as interested in promoting the use of reinforced concrete as he was in inventing.

The early commercial development of reinforced concrete in the United States was undertaken by Ernest Ransome (1844-1917). His first major contribution to the field of reinforced concrete was a patent for a twisted square metal bar, in 1884, which he believed formed a stronger bond with the concrete. In 1888 Ransome put up his first major building with reinforced concrete beams, arches and cast-iron columns (Bourn & Wise wine-cellar, St. Helena, CA). The next year he installed the first ribbed floor construction in America (Borax Works, Alameda, Ca.). A ribbed floor is a t-beam construction with reinforcement in the bottom of the ribs. In the early 1890s he added the concept of laying helices of wire into the floor slab, and half embedded into the floor ribs, in order to ensure a proper bond between the floor slab and ribs and to reinforce the floor slab. The final development in the Ransome system of construction came in 1902, in which he added precast beams. He patented the system as "The Ransome System of Unit Construction." Ransome would often divide the floor of a building into square panels, from 7 to 11 feet square, with beams running in both directions. This is clearly visible in old pictures of the Johnson Service Company Building.

After 1900, reinforced concrete was quickly adopted for use in industrial buildings of one or more stories. The advantages of using this material in construction are that buildings can be erected quickly, they are fireproof (an important consideration after the Chicago fire) and they resist vibrations from heavy machinery. Soon after 1900 methods emerged for transferring the load-carrying capacity of beams and girders to reinforced floor slabs, although the beam, girder and slab combined as a cohesive unit remained supreme until 1910. After that the girderless slab, otherwise known as the Mushroom Slab or flat slab began to be built. This innovation saved overhead room, which was important in factory buildings.

The construction of the Johnson Service Company Building occurred at the time when Ransome was about to unify the elements of his system of construction, and while it is known that the Ransome system was used in this case, it is not certain whether precast beams were used. It is important to note that although reinforced concrete technology was widely known by 1903 it had not by any means reached its final form and its safety was still a subject of debate among experts in construction. This view is best expressed in an edition of **Carpentry and Building** magazine from 1902, which said that "A great deal of attention is just now being given to the use of concrete in building construction and everything pertaining to the method of doing the work is perused with more than usual interest". In New York, the Manhattan Bureau of Buildings was unsure of "the advisability of granting permission to several cement and reinforced concrete construction companies to introduce their systems here", because "Builders are generally agreed that cement will be the most popular building material of the future, but are not unanimous that any system of construction has yet been invented entirely equal to modern requirements" (**Engineering News**, December 1902). Reinforced concrete buildings often failed in these times either because the concrete had not been allowed to set, or had been poured in excessively cold weather, or because the stresses placed on the building had been miscalculated. Construction of the Johnson Service Co. certainly attracted attention when the building partially collapsed midway through construction, in March 1903, although the damage was not sufficient to prevent its completion.

On September 8th, 1902, it was announced that the Johnson Service Co. proposed to build a new headquarters in downtown Milwaukee, at a cost of $100,000. The building was to be used for offices, manufacturing and storage and would be the most modern building in the city. The work was done by two different contractors, one of whom did the masonry work and the other of whom was responsible for the concrete floor construction. The method of construction would be the same as that used in the Ingalls building, in Cincinatti, in which the construction of the exterior brick walls proceeded at the same time as the moulding of the concrete floors. As the building went up, floor by floor, it would look as if each floor were ready for occupation at that point, as opposed to the method of erecting a skeleton of steel and covering it with masonry afterwards. Construction on the Johnson Service Company Building began some time in late 1902.

When the building had reached a height of five stories, and was about to take its place as a success story in the use of modern technology, disaster struck. On the evening of Saturday March 28th, 1903, there was a major structural

failure and a large V-shaped section of the Michigan Street facade collapsed, along with the third, fourth and fifth floors. A large crowd gathered to inspect the proceedings and on Monday morning the local newspapers picked up the story. The **Evening Wisconsin** (March 30, 1903) trumpeted that "The building embodies a new idea in fire-proof construction, the floors being made of concrete bound by steel rods laid like mesh while the concrete is soft. Architects and builders in all parts of the country were watching this building with a great deal of interest, as it was regarded as a demonstration that expensive steel girders and hollow tiling have a cheaper substitute in concrete".

For the next two weeks theories abounded in trying to explain the collapse of the Johnson building, ranging from faulty wooden supports to cold weather. Professor Johnson acted quickly to investigate the mishap, hiring a Professor Taylor of the University of Wisconsin and a team of other experts to conduct tests. The team of experts concluded that the collapse was due to "an abnormally heavy load in one part of the structure". The building inspector for the city, Michael Dunn, said that no effort would be made to prevent this kind of construction, as he was confident that if handled properly concrete was safe to use. Professor Johnson deemed it necessary to make a public statement "as the public of Milwaukee had taken a decided interest in the construction of the building". He began with reassurances that "In the first place, the method of construction is not new but well known and long tried", which was an exaggeration as reinforced concrete buildings had a habit of collapsing at this time. The important thing to note, he continued, is that "The absolute substantial character of the building is assured, making it one of the most perfect and modern buildings in Milwaukee". Construction continued and the Johnson Service Co. expected to move in within a month of the accident, at an additional cost of some $4,000. By November of 1903 advertisements were appearing in local trade journals offering space in the building to prospective tenants. The major selling point was that there would be no fire insurance to pay as the building was constructed from an entirely fire-proof material.

In 1923 the Johnson Service Co. decided to make an addition to the original building, although maintaining the same architectural style, which would double the size of the structure. The construction technique for the addition differed from that of the original building, as it was built with a reinforced concrete frame and brick curtain walls. At first glance it is difficult to tell that an addition has been made to the original building, but upon closer inspection it can be noted that the brick used in the addition is of a slightly different color.

The Architect

Herman J. Esser (1865-1957) was born in Madison, Wisconsin, and spent almost his entire career designing buildings in the Milwaukee area. He graduated from Cornell University in 1888 and then trained in several architectural firms in New York City. Esser had previously worked as a draftsman in the H.C. Koch & Co. (1884-89) architectural firm, in Milwaukee and was later made a partner (1890-99) in the same firm, where he co-designed a number of landmark Milwaukee buildings. After parting company with the H.C. Koch Co., Esser started his own architectural business which he ran for more than thirty-five years, before he retired in 1937.

Although Esser was responsible for designing a number of residential and small office properties, it is undoubtedly his work with large scale office buildings, commercial buildings and warehouses which make his work worthy of protection. During his time as a partner at H.C. Koch Co. he was involved in the design of the Pfister Hotel (1890-93) at 424 E. Wisconsin Avenue, the Milwaukee Protestant Home (1892) at 2449 N. Downer Avenue, Milwaukee City Hall (1893) at 200 E. Wells St., Commission Row (1894-95) at 317 N. Broadway, the Wellauer and Hoffmann Co. building (1893-94) at 246 N. Broadway, the Wisconsin Industrial School Addition (1895), and Gesh Church (1892,1902) at 1201 W. Wisconsin Avenue. Nearly all of these buildings are located in what can be considered the downtown portion of Milwaukee and represented significant additions to the existing development in the area.

Esser designed a number of notable local buildings from the offices of his own architectural firm, including the Milwaukee Electric Railway and Light Co. building (1900) at 108 E. Wells St., the Johnson Service Company Building (1903) at 507 E. Michigan St., the St. Hedwig Church Rectory (1903) at 1716 N. Humboldt Ave., the Wisconsin Electric Power Co. building (1903-05/1926) also known as the Public Service Building at 231 W. Michigan St., the Stroh Building (1910) also known as the American Appraisal Building at 525 E. Michigan St., the Van Dyke Knitting Co. building (1913) at 2102 W. Pierce St., the Cutler-Hammer Manufacturing Co. building (1917) at 1222 W. St. Paul, the Gimbel Bros. downtown store (1919) at 106 W. Wisconsin Avenue, and the Robert A. Johnston Co. building (1920) at 4023 W.

National Avenue. He designed at least ten large scale buildings which used reinforced concrete as the major structural material, which places him among the leading Milwaukee architects whose work brought the city into an age of modern building technology in the early twentieth-century. Esser's work undoubtedly helped to shape the architectural character of downtown Milwaukee.