

FINAL LANDMARK DESIGNATION REPORT

**Garrett Birkhoff House
45 Fayerweather Street
Cambridge, Mass.**

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Fig 1: Existing view, North Elevation of the Birkhoff House from Fayerweather Street (CHC Photo, 2012)

Summary

The Garrett Birkhoff House, located at 45 Fayerweather Street (Fig. 1), is significant for its associations with the mathematician who commissioned the building and the architect responsible for the original design. These two men, Garrett Birkhoff (Fig. 2) and Walter Bogner (Fig. 3), were contemporaries on the Harvard faculty and were both involved in significant theoretical advancements in their respective fields during the early 20th century. Birkhoff studied mathematics, quantum mechanics and abstract algebra. His academic writings included groundbreaking discoveries about the role of proportions in the study of physics. His published theories continue to serve as fundamental academic texts for contemporary mathematicians.

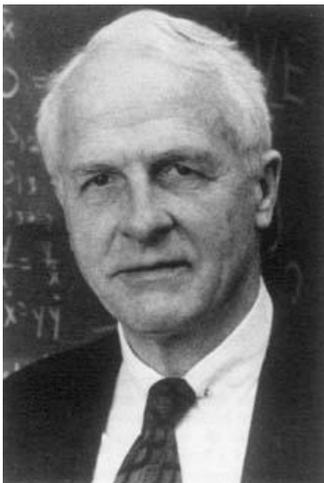


Fig. 2 (above, left): Garrett Birkhoff (1911-1996) was a skilled mathematician perhaps best known for developing the Lattice Theory.

Fig. 3 (above, right): Walter Bogner (1899-1993) is pictured here (standing, far right) teaching a studio class in 1947 with Walter Gropius (seated, far left) at the Harvard Graduate School of Design.

During this period architects were working in the International Style, which was based on simple geometric volumes and strove to combine high quality local materials with prefabricated building elements. Walter Bogner was an early practitioner of the innovative style, which had taken shape in Europe during the 1920s under the leadership of architect Le Corbusier's International Congresses of Modern Architecture (CIMA) and the German Bauhaus. It later gained a dedicated following in the United States throughout the 1930s-40s. The collaboration between Birkhoff and Bogner resulted in a refined example of domestic architecture in the International Style and the only Bogner-designed building in Cambridge.

The site of the Birkhoff House is one of the highest points in the city, in an area of Old Cambridge called Reservoir Hill. The lot was originally occupied by an 1840s residence owned by Boston hardware merchants, the Smith family. At the time of its construction it was one of the only structures north of Brattle Street until the installation of a reservoir one block to the east prompted more widespread development. Based on historic maps and city directories, the Smith House was expanded in size and continuously occupied by family members until 1919. After nearly 20 years of vacancy the house was demolished in 1937 leaving only the fieldstone foundation intact. This would later be incorporated into a sunken outdoor garden space (Fig. 4) that is one of the defining features of the Birkhoff House.



Figure 4: Garrett Birkhoff House, 45 Fayerweather Street (CHC Survey Photo, 1968)

Birkhoff and his wife, Ruth, resided at the property from the time of its completion in 1940 to the later years of their lives, only selling the property in 1995 a year before Garrett's death at age 85. The second owners, Sigmund "Bud" Herzstein and his wife Barbara, replaced the windows in 1996 but made few other changes. They lived in the house for over a decade until their deaths in 2008 and 2011 respectively. With Barbara's passing in May of 2011, the future of the property rests with the trustee of the Herzsteins' estate since it is currently held in a family trust.

In recent years several examples of Cambridge's International Style and Modern architecture have been lost to redevelopment, including the teardown redevelopment of a 1968 residence at 46 Fayerweather Street. Given the generous size of the two commonly held lots along with the height and square footage allowances for the A-1 zoning district, the Birkhoff House could be subject to insensitive alterations or proposals for its demolition.

The pertinent zoning regulations for a Residence A-1 district are as follows.¹

District	Type	Floor-Area Ratio	Maximum Height (in feet)	Minimum Lot Area per Dwelling Unit (in sq. ft.)	Maximum Dwelling Units Per Acre
A1	Residence Single Family	0.50	35	6000	7

District	Minimum Lot Width	Minimum Front Yard Setback	Minimum Side Yard Setback	Minimum Rear Yard Setback	Minimum Ratio of Open Space to Lot Area
A1	80'	25'*	15' (sum of 35)	25'	50%

* In a Residence A-1 district a dwelling need not set back more than the average of the setbacks of the buildings, other than accessory buildings, on the lots adjacent thereto on either side, but in no case may any part of a building or accessory building extend nearer to any street line, or building line if such has been established, than fifteen (15) feet. A vacant lot ... in a Residence A-1 district shall be considered as though occupied by a building set back twenty-five (25) feet.

To summarize, the zoning calculations indicate that only one single family residence could be built as-of-right on the combined existing lots. If an owner sought to subdivide the existing acreage into three 6,000 sf lots, it would require the demolition of the existing house.

Development of one other house on the property could be possible while also retaining the Birkhoff House on site.

B. Ownership and Occupancy

The current owner of record is The Fayerweather Trust. It is believed that the property is currently unoccupied.

C. Area Description

The Garrett Birkhoff House is located near the top of Reservoir Hill, between Brattle Street to the south and Huron Avenue to the north. Reservoir Hill, Avon Hill, and Observatory Hill comprise three summits of the glacial moraine that divides Fresh Pond from the Charles River. Historically, the south-facing slopes of the moraine enjoyed the advantages of a milder micro-climate and more convenient access, and so developed first as farmland, then as rural estates, and finally as spacious suburban neighborhoods; they were substantially built up by the end of the 19th century. The north slopes, on the other hand, did not develop until the 20th century, after the construction of a streetcar line along Huron Avenue. The very top of the hill, however, contains several mid-20th century houses that replaced some large mansions of the Victorian period.

The oldest houses on Fayerweather Street date to the mid- to late-1800s and are concentrated towards the south end, closest to Brattle Street. Most of these buildings are two to three-story houses in various Revival styles, ranging from Colonial Revival to Queen Anne. When the road was expanded north of Gurney Street in 1911, a single developer promptly filled the new lots

¹ The following tables (and the text presented in Arial type) are taken from the online edition of the Cambridge Zoning Ordinance, <http://www.cambridgema.gov/CDD/zoninganddevelopment/Zoning/Ordinance.aspx>

north to Huron Avenue with a series of 2½-story duplex houses in a period of two years. The Birkhoff House is between these two groupings of residential development, just west of Reservoir Street.

Southeast of the Birkhoff House at the corner of Reservoir Street is a 3-story gambrel built in 1881 for one of the founders of The Society of Arts & Crafts organization in Boston, Arthur Astor Carey (#28). Proceeding north along the same side of the street, the next two houses are a newly constructed 2½-story residence completed in 2010 (#46) and Arthur Astor Carey's second house, a three-story Georgian Revival (#48) designed by architect Hartley Dennett and completed in 1904.

On the west side of the street, immediately north of the property is a 2½-story brick Colonial Revival (#55) that underwent extensive renovations in 2008 under the Commission's review. Lincoln Lane is immediately south of the property. The next house to the south of Lincoln Lane is a 2½-story frame Colonial Revival (#39) that was built in 1923 as part of the Lincoln Lane subdivision. The rear or west end of the lot abuts a 3-story Tudor Revival residence at 8 Lincoln Lane which was constructed in 1927.

D. Context of this Designation Report

The modest size and scale of buildings from this period in architecture makes them vulnerable to alteration by homeowners seeking larger, more contemporary living spaces.

Following the death of the last owner, the Commission decided to hold a public hearing on August 4, 2011 to propose a landmark designation study of the property and initiate a review process for any proposed changes during the study period. At the request of a trustee for the property, the hearing was continued until September 8, 2011.

One letter and one phone call were received from direct abutters in support of the landmark designation study prior to the public hearing. Following the presentation of the staff recommendation and their deliberation of the case, the Commission voted to initiate a 12-month landmark study period which would expire on September 8, 2012. The interim protections provided by the ordinance will also expire at that time.

II. Description

The Birkhoff House was constructed as a two-story, flat-roofed rectangular block with simple massing and flush walls that intentionally lack any extraneous ornament. A detached garage was added at the southeast corner of the building, perpendicular to the house (Fig. 6). Unlike traditional houses that typically face the street, the entrance was purposely placed around the front corner and screened by a brick wing wall. While the North and East Elevations are the most publicly visible sides of the building, for that exact reason they were designed with minimal fenestration and appear stark when viewed from Fayerweather Street. As automobile traffic increased during the mid-20th century, front porches were often abandoned in favor of private gardens and terraces positioned away from the roadside noise and fumes.

The primary elevation of the house faces south onto the generous side yard and Lincoln Lane beyond (Fig. 7). The house is two stories in height with a partial full basement. In keeping with the practices of the International Style, the materials used to clad the exterior were natural materials commonly used in the local building tradition. Salvaged red brick is the primary

help to create a visual connection between the indoors and the surrounding landscape. In 1975, the Birkhoffs expanded their surrounding open space when they purchased additional land to the north (Lot 144) from John and Abigail Van Vleck.

The building was described by Bainbridge Bunting in the 1973 architectural survey as follows:

The use of antique red brick salvaged from a demolished Back Bay house kept 45 Fayerweather Street from being a textbook example of International Style design, but the texture of the brick enlivens the strong geometry of the composition. The house is well sited on a large wooded lot, with a conservatory facing a sunken garden that is surrounded by the foundations of the previous house on the site. Built in 1940 for Harvard mathematics professor Garrett Birkhoff and his wife Ruth, a talented gardener, the house was designed by Harvard architecture professor Walter Bogner, who had built his own Modern house the year before near Walter Gropius's in Lincoln. Bogner occupied an awkward position at Harvard's School of Architecture; although he had been on the faculty since 1927, he had been trained in the Beaux Arts tradition and thus could never be acceptable to Gropius, who became dean in 1937. Bogner's own house in Lincoln was featured in *The Modern House in America* (1940), although a student in the same year dismissed him as "a very good traditionalist" who "simply couldn't make the shift" to the International Style (Manny, 29).

Cambridge Historical Commission. *Survey of Architectural History of Cambridge. Report Four, Old Cambridge*. MIT Press: Cambridge, 1973.

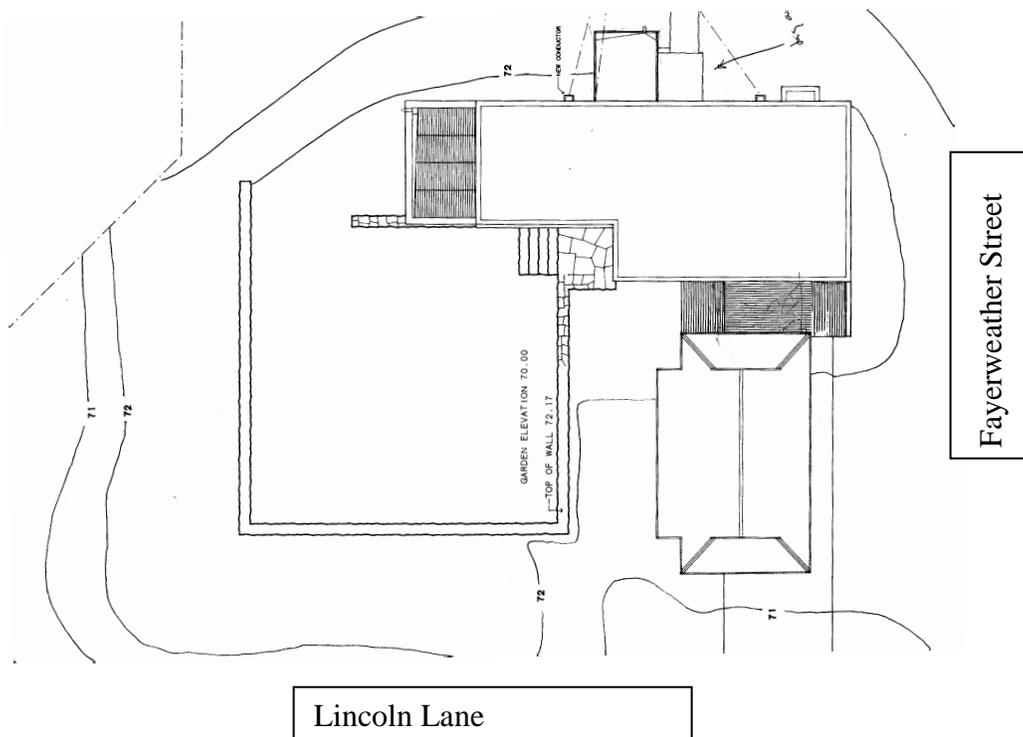


Figure 8. Plan of 45 Fayerweather St. in Cambridge, Massachusetts prepared for the Herzsteins, Mar. 1, 1996 (City of Cambridge, Inspectional Services Permit Files)

The glass conservatory mentioned in the above text and captured in the 1968 survey photograph, was removed at an unknown date. In 1986, Mrs. Birkhoff was issued a special permit to convert

the garage into living space. Ten years later, after the second owners purchased the property, renovations were made to both the interior and exterior of the house.

The original steel casement windows were manufactured by the Hope Company, which also supplied the windows for both Walter Gropius and Marcel Breuer's personal residences in Lincoln, Massachusetts. These steel windows were removed in 1996 as part of a larger remodeling (Fig. 8). Notes from this project indicate that some of the salvaged windows were offered to Historic New England to be used for repairs at the Gropius House Museum.

III. History and Significance of the Property

This portion of Fayerweather Street was laid out in 1847 as a connection between Brattle Street to the south and Vassal Lane to the north. One of the earliest residences on the street was constructed at 45 Fayerweather for the Smith family, merchants who owned a hardware company in Boston. The Smiths had a large plot of land surrounding the house which was subdivided in 1921 to create Lincoln Lane (Fig. 9). According to city directories, the Smith House was vacant by 1919 and the 1840s structure was demolished nearly 20 years later, leaving only the fieldstone foundation in place (Fig. 10).

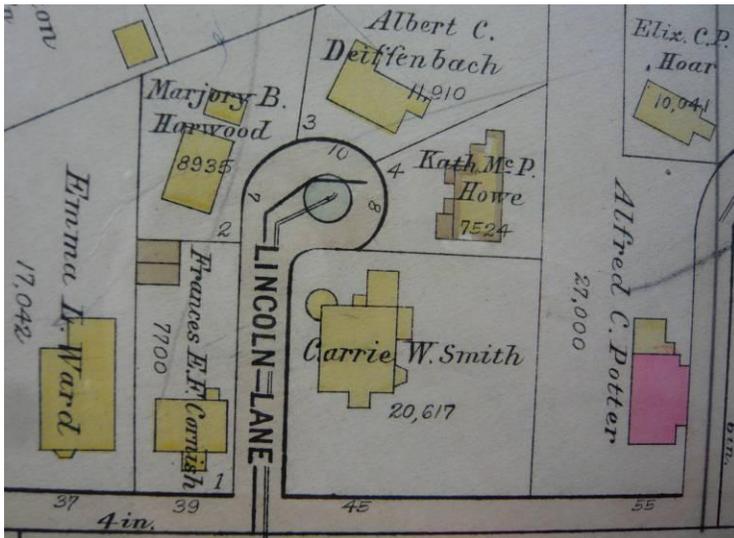


Figure 9: Map of 45 Fayerweather Street showing the footprint of the original structure on the lot prior to its demolition. (*Atlas of Cambridge, 1930, detail*)



Fig. 10: Rear garden of the Birkhoff House. The stone foundation of the historic 1840s structure was retained and incorporated into the new landscape.

The original owner of the existing house, Garrett Birkhoff, was born on January 10, 1911 in Princeton, New Jersey but was raised in Cambridge. His father was a professor of Mathematics at Harvard, where Garrett taught for over 40 years until his retirement in 1981. In 1940, Garrett was just 29 years old and had been married for two years when he commissioned his Harvard colleague from the Graduate School of Design, Walter Bogner, to design a house for him and his wife, Ruth Collins Birkhoff. Bogner completed designs for the Birkhoff residence in March and the purchase of the house lot (Lot 120) was finalized on June 30, 1940.

Walter Bogner was a classically trained architect who taught at Harvard's Graduate School of Design (GSD) from 1929—1966 and worked under the leadership of Dean Joseph Hudnut for much of that time. He was one of the few faculty members who made the transition from the previous administration through the Gropius years at the GSD. In 1942, Bogner wrote an article for *Architectural Forum* on prefabrication in architectural design and the evolution of family housing after World War II. Throughout the 1950s-60s, he was involved in numerous, large-scale urban planning initiatives in Boston, Providence, San Francisco and as part of the post-war reconstruction efforts in Germany. Though Bogner's Modern designs were underrated by some of his contemporaries, his works are now featured on many architectural tours as outstanding examples from the period. He retired as a Professor Emeritus from Harvard in 1966, and a scholarship program was created in his name.

In the years immediately preceding the commission for the Birkhoff residence, Bogner and his fellow faculty member Walter Gropius had designed homes for themselves on neighboring sites in Lincoln, Massachusetts. Both the Gropius House (Fig. 11) and the Bogner House (Fig. 12) were designed in the newly-penned International Style which was devoid of exterior ornament and geometric in its overall massing. Their houses featured second floor, open-air terraces and large plate glass windows to create a connection between the interior living spaces and the surrounding environment. Incorporated into the landscape plans are natural stone walls that act as partitions to create smaller, more secluded yards and terraces. All of these elements were repeated in Bogner's later design of the Birkhoff House (Figs. 13 & 14).



Fig. 11 (above, left): Rear elevation of the Gropius House (1938) showing wide bands of ribbon windows, a natural stone retaining wall and sunken rear garden. (HABS photo)

Figure 12 (above, right): Walter Bogner's personal residence (1939) was designed with a transparent corner of large plate glass windows and an open terrace on the top floor. (Boston Globe photo)

The Birkhoffs raised three children at 45 Fayerweather Street and lived in the house for over 40 years. Over the length of his career, Garrett Birkhoff achieved widespread recognition for his advancements in the study of Lattice Theory and innovations in the field of military science. His work improving targeting calculations is credited as a precursor to “smart bomb” technology. He died on November 22, 1996.

Ruth Wills Collins, the daughter of Lester and Anne Collins of Moorestown, New Jersey, was born on August 15, 1917. Ruth was passionate about conservation issues and was well known as a stalwart of the Cambridge Plant & Garden Club. She was involved in many civic ventures and served as an appointee to two city boards, the Conservation Commission and the Water Board. She died in Water Mill, New York on November 3, 2000 at the age of 83.

In 1995, when the Birkhoffs were in their 80s, they sold both lots to the second owners, the Herzsteins, whose estate is still in possession of the property.



Fig. 13 (above, left): The use of natural materials acts as a transitional tool between the geometric massing and the surrounding organic landscape. (CHC photo, 2012)

Fig. 14 (above, right): A junction in the wall planes between the preserved 1840s foundation and the salvaged stones that were used as exterior cladding on the new building. (CHC Photo, 2012)

IV. Relationship to the Criteria

A. Criteria for Landmark Designation

The enabling ordinance for landmark designation states:

The Historical Commission by majority vote may recommend for designation as a landmark any property within the City being or containing a place, structure, feature or object which it determines to be either (1) importantly associated with one or more historic persons or events, or with the broad architectural, aesthetic, cultural, political, economic or social history of the City or the Commonwealth or (2) historically or architecturally significant (in terms of its period, style, method of construction or

association with a famous architect or builder) either by itself or in the context of a group of structures . . . (City Code, Article III, Chapter 2.78.180.A)

B. Relationship of Property to Criteria

The Garrett Birkhoff House is significant under Criterion 1 for its association with the original property owner, who was an influential theorist, professor and pioneer in the realm of quantum mechanics. Birkhoff's project architect, Walter Bogner (Fig. 15), is also an important figure in the early development of the International Style of architecture in the United States.

This period of new and inventive architecture became a hallmark of the 1930-40s, as practitioners who had studied under Bogner at Harvard expanded upon the principles of modular design. Many would go on to promote economical, multifunctional building design as part of their own architectural firms.

The building is also significant under Criterion 2 as the only building in Cambridge designed by architect Walter Bogner, who was a contemporary of Walter Gropius on the faculty of Harvard's Graduate School of Design and a chief advocate of the International Style of architecture as part of the college's teaching curriculum.

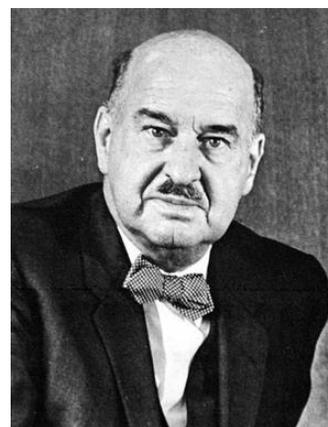


Fig. 15: Walter Bogner, architect

V. Recommendations

A. Article III, Chapter 2.78.140

The purpose of landmark designation is contained in the enabling ordinance, which is to:

preserve, conserve and protect the beauty and heritage of the City and to improve the quality of its environment through identification, conservation and maintenance of . . . sites and structures which constitute or reflect distinctive features of the architectural, cultural, political, economic or social history of the City; to resist and restrain environmental influences adverse to this purpose; [and] to foster appropriate use and wider public knowledge and appreciation of such . . . structures . . .

B. Preservation Options

Landmark designation or donation of a preservation easement are the only two options for the permanent long-term protection and preservation of the Birkhoff House. While the house may be eligible for individual listing on the National Register of Historic Places, National Register listing alone would not permanently protect and preserve the building.

C. Staff Recommendation

It is the staff recommendation that the Commission find that the Garrett Birkhoff House meets the criteria for landmark designation and should be a protected landmark under Article III, Chapter 2.78.

VI. Standards and Criteria

Under Article III, the Historical Commission is charged with reviewing any construction, demolition or alteration that affects the exterior architectural features (other than color) of a designated landmark. This section of the report describes exterior architectural features that are among the characteristics that led to consideration of the property as a landmark. Except as the order designating or amending the landmark may otherwise provide, the exterior architectural features described in this report should be preserved and/or enhanced in any proposed alteration or construction that affects those features of the landmark. The standards following in paragraphs A and B of this section provide guidelines for the treatment of the landmark described in this report.

A. General Standards and Criteria

Subject to review and approval of exterior architectural features under the terms of this report, the following standards shall apply:

1. Significant historic and architectural features of the landmark should be preserved.
2. Changes and additions to the landmark which have taken place over time are evidence of the history of the property and the neighborhood. These changes may have acquired significance in their own right and, if so, that significance should be recognized and respected.
3. Deteriorated architectural features should be repaired rather than replaced.
4. When replacement of architectural features is necessary, it should be based on physical or documentary evidence.
5. New materials should, whenever possible, match the material being replaced in physical properties, design, color, texture, and appearance. The use of imitation replacement materials is generally discouraged.
6. The surface cleaning of a landmark should be done by the gentlest possible means. Sandblasting and other cleaning methods that damage exterior architectural features shall not be used.
7. Additions should not destroy significant exterior architectural features and should not be incongruous to the historic aspects, architectural significance, or distinct character of the landmark, neighborhood, and environment.
8. Additions should be designed in a way that, if they were to be removed in the future, the essential form and integrity of the landmark would be unimpaired.

B. Suggested Review Guidelines

1. Site Development.

Additions to the house, if allowed, should respect the form, massing and materials of the original without slavishly imitating it.

Alterations to publicly visible landscape structures, including walls, paths, driveways, and the like, should be consistent with the original design and materials.

In the Residence A-1 district, the combined property's 18,000 square foot parcel could theoretically be subdivided into three 6,000 sf lots, but this would require destruction of the existing house. Development of one other house on the property might be considered, but the new structure would have to be sited and designed so as to leave the Birkhoff house as the dominant structure on the property.

2. Alterations

a. Exterior surfaces

Exterior materials should be preserved insofar as practicable. Special care should be taken to protect and maintain the appearance of the masonry and fenestration. Repointing the mortar joints should be done with special care to maintain the color and texture of the mortar and the profile of the joints. The brick masonry should never be painted.

b. Fenestration

Introduction of new window openings should be discouraged. Existing sash should be maintained, but when replaced should conform to the original design of the steel sash as closely as possible. Storm windows may be installed or upgraded without review in conformance with current Commission guidelines.

c. Interior features

Although interior features are not subject to the jurisdiction of the Cambridge Historical Commission, the owner should be encouraged to preserve original spaces, materials and detailing.

d. Landscape features

The foundation wall of the Smith House, which was incorporated into the design of the Birkhoff House landscape, is a significant structure and feature of the landscape architecture of the home. It should be protected as such to the extent that it is visible from a public way.

VII. Proposed Order

That the Garrett Birkhoff House, 45 Fayerweather Street, be designated as a protected landmark pursuant to Chapter 2.78, Article III, Section 2.78.180 of the Code of the City of Cambridge, as recommended by vote of the Cambridge Historical Commission on July 12, 2012. The premises so designated is the land defined as parcels 120 and 144 on assessor's map 236 and the structures thereon and the premises described in two separate deeds recorded in Book 25854, Page 95 and Book 25854, Page 93 of the South Middlesex Registry of Deeds.

This designation is justified by the important architectural and historical associations the property embodies as the residence of the distinguished mathematician Garrett Birkhoff and his wife, Ruth Collins Birkhoff, and as the only Cambridge example of a building designed by the Modernist architect Water Bogner.

The effect of this designation shall be that review by the Cambridge Historical Commission and the issuance of a Certificate of Appropriateness, Hardship or Non-Applicability shall be required

before any construction activity can take place within the designated premises or any action can be taken affecting the appearance of the premises, that would in either case be visible from a public way. In making determinations, the Commission shall be guided by the terms of the Final Landmark Designation Report, dated July 17, 2012 with respect to the designated premises, by Section VII, Standards and Criteria of said report, and by the applicable sections of Chapter 2.78, Article III, of the Cambridge Municipal Code.

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