

WAKE COUNTY HISTORIC PROPERTY DESIGNATION APPLICATION FORM

1. Name of Property

Historic Name: E. B. Bain Water Treatment Plant

Current Name: \_\_\_\_\_

2. Location

Street Address: 1810 Fayetteville Road

City/Town or Jurisdiction Raleigh

NC PIN Number or Tax Map and Parcel Number: 1703.19 9796

3. Owner Information (If more than one, list primary contact)

Name: City of Raleigh

Address: PO Box 590

Raleigh 27602

Phone: 890-3050

4. Applicant/Contact Person

Name: RALEIGH HISTORIC DISTRICTS COMMISSION, INC.

P.O. BOX 829, CENTURY STATION

Address: RALEIGH NC 27602

Phone: 832-7238

5. General Data/Site Information

A. Date of construction and major additions/alterations: 1939-40 (portions of the plant dating from 1887 and the 1920s are incorporated)

B. Number, type, and date of construction of outbuildings: 3 clear storage reservoirs, one 1887 with alterations, one 1939-40, one 1950s

C. Approximate lot size or acreage: 7.75 acres

D. Architect, builder, carpenter, and/or mason: William C. Olsen, Engineer  
A. H. Guion, General Contractor

E. Original Use: Water treatment plant for City of Raleigh

F. Present Use: Vacant

6. Classification

A. Category (building(s), structure, object, site): Building and structures

B. Ownership (private or public): Public

C. Number of contributing and non-contributing resources on the property:

	<u>Contributing</u>	<u>Non-contributing</u>
Buildings	<u>1</u>	<u>      </u>
Structures	<u>2</u>	<u>1</u>
Objects	<u>      </u>	<u>      </u>
Sites	<u>      </u>	<u>      </u>

D. Previous field documentation (when and by whom): Helen Ross 7/91

E. National Register status and date (listed, eligible, study list):         
Study list-1992

7. Signature of Applicant:       

8. Supporting Documentation (Attach to application on separate sheets. Please type or print.)

A. Photographs. Application must include at least two current black and white photos of different views. Photos must be labeled in pencil with the name of the property, its address or location, and the date. Additional photographs of the exterior or interior of the property are helpful. Black and white or color photographs or color slides are acceptable for additional views.

B. Maps. Include a map showing the location of the property. Tax maps with the boundaries of the property are preferred, but sketch maps are acceptable. Please show street names and numbers and all structures on the property.

C. Justification for area to be designated. Describe the appearance and use of the land to be designated.

D. Architectural description and significance. Describe the property, including exterior architectural features, additions, remodelings, and alterations. Also describe significant outbuildings and landscape features. If any interior features are to be designated, describe them in detail and note their locations. Include a statement regarding the architectural significance of the property.

E. Historical Significance: Note any significant events, people, and/or families associated with the property. Include all major owners. Please include a bibliography of sources consulted.

Return completed application to:

Wake County Historic Preservation Commission  
c/o Wake County Planning Department  
P. O. Box 550  
Raleigh, NC 27602

FOR OFFICE USE ONLY Date Received:

Received by:

**WAKE COUNTY HISTORIC PROPERTY DESIGNATION APPLICATION FORM**  
**E. B. Bain Water Treatment Plant**

Supporting Documentation

A. **Photographs.** See attached views.

B. **Maps.** Tax Map attached.

C. **Justification for area to be designated.**

The area to be designated includes the tract on which the E. B. Bain plant was constructed, minus two small sections at the south end occupied by the 1887 water treatment plant and a modern building that is part of the sewage treatment system. This sloping, grassy site south of downtown incorporates all of the structures originally associated with the water treatment plant and provides an appropriate setting for them.

D. **Architectural description and significance.**

The E. B. Bain Water Treatment Plant complex, completed in 1940, is a multi-element industrial facility located on Fayetteville Road adjacent to Walnut Creek in south Raleigh. It includes the large Art Deco/Art Moderne/Restrained Classical Style treatment plant, its adjacent settling basins, and three clear wells or storage reservoirs for treated water.

When the plant was in operation, the first step in treatment involved bringing water into the settling basins located just west of the main building. These basins are deep concrete tanks overlaid by a concrete grid. The greater portion of the basins are below grade, but at the south end the side of the basins rises above the ground. This exposed elevation is finished with a blind arcade of concrete arches. The front row of tanks at the north end, the mixing tanks, are equipped with rocking mechanical flocculators which combined the raw water with chemicals added to bring about the flocculation of foreign materials in the water. In front of the mixing tanks is the steel framework of a horizontal beam crane used to transport the heavy containers of dry chemicals formerly originally used in water treatment.

The northern two thirds of the sedimentation basins were incorporated from the previous treatment plant, their sides raised to increase their capacity. The southernmost basins were built after the former filter building was cleared away.

Once the particles had settled out, the water was drawn from the sedimentation basins into sand-filled filters inside the treatment building. These filters consisted of a number of two-story concrete tanks ranged in a gallery along the west side of the building. Although the sand has been removed from the filters, the tanks remain. Water was drawn from the bottom of the filters by a series of large pipes located in the pipe gallery directly below the main operating floor. Adjacent to the pipe gallery is the pump room, a two story space along the east side of the plant

that contains the large electric and gasoline-powered pumps used to move water around the system. These pumps would push the treated water either into the distribution system or into three clear wells located to the west of the plant building, covered tanks used for the storage of treated water as a backup to the system.

These stone and concrete tanks have an aggregate capacity of 8.3 million gallons. The semi-elliptical tank closest to the treatment plant was carried over from the 1887 waterworks. Its odd shape is the result of the E. B. Bain Plant being built literally on top of it. To the southwest of it is a rectangular tank built in 1940 and to the northeast is a round tank dating from the 1950s. All of the clear wells were originally unroofed.

The dominant element of the water treatment complex is the main treatment building consisting of the three-story (plus basement) head house and, extending from the south end, the thirteen-bay, two-and-a-half-story wing housing the operating floor and pipe gallery. Along the entire west side of the rear wing is the two-story filter gallery, while on the east side of the rear wing is the seven-bay, two-story pump house. Overall, the building has a concrete frame that is clad on the outside with Flemish bond brickwork. The exposed concrete foundation walls form a water table and light-colored ornamental cast stone units (some painted white) serve as pilaster bases and caps, copings, and cornice friezes. Windows throughout are multi-paned steel industrial units, usually with pivoting panels. Most of the roofs are flat, built-up roofing with gravel ballast.

The exterior of the head house is made up of interlocking rectangular masses. The central, three-bay wide, three-story mass is topped by a hipped, battened metal roof. Flanking this central portion are one-bay, slightly shorter sections stepped back on the front (north) elevation. And to the outside are wider, one-bay, two-story sections stepped still further back. These flanking sections are ornamented on their north faces with vertical, fluted panels of mouse-toothed brick. The central pavillion and the first set of flanking sections have cornices composed of a fluted frieze with coping, while the outer sections have a plain frieze with coping. Centered in the front elevation of the head house is the main entrance, marked by a three-bay, one-and-a-half-story cast stone frontispiece. Vaguely Art Deco in appearance, the frontispiece has a recessed doorway that steps back on the sides and is corbelled at the top. On either side of the doorway are long, fluted panels with small ornamental panels above them, and Art Deco style metal and glass lanterns. At the top of the frontispiece is a stepped cornice containing a fluted frieze. The double doors themselves are modern aluminum replacement doors with a blank transom on top. Above the doorway is a cast aluminum plaque that reads "Ernest B. Bain Water Plant."

The side elevations of the main block of the head house are five bays deep, with paired windows with cast stone sills. At the southeast corner of the head house is a double doorway framed in cast stone, in front of which is a loading dock. The outer section side elevations are three bays wide, with paired windows. On the west side of the head house is a one-story pavillion added in the 1950s as a

loading area for bulk chemicals. Atop the head house are the cubical masses of the elevator and stair tower and chimney.

Extending from the rear of the head house, the two-and-a-half-story south wing is divided into thirteen bays by brick pilasters with stepped, cast-stone capitals. Where they are completely exposed, the bays each have two-story, triple window strips topped by three square windows that form a horizontal clearstory. Superimposed on the east elevation of the rear wing is the two-story, seven-bay pump room, which has pilasters and triple windows in the same rhythm as the main rear wing. The south elevation of the pump room contains a large roll-up door and a single square window.

The filter gallery runs the entire length of the rear wing on its west elevation. While it is two stories tall, only the upper story rises above the sedimentation basins. The side elevation of the filter gallery is also divided into bays by pilasters, each bay containing three short windows. Above the filter gallery is a clearstory of square windows on the west elevation of the rear wing.

At the south end, the rear wing and the filter gallery are defined by heavy corner pilasters. The south elevation of the main wing has a fully-exposed basement level. At the first floor level is a single door with cast stone surround, reached by a gracefully-curving concrete stair with wrought iron railings. Above the doorway is a vertical strip of window.

Entering the head house, one encounters a generously-dimensioned, two-story lobby with a mezzanine running around the upper level. Directly opposed to the front entrance is a monumental stair that rises to a landing and then carries on to the mezzanine in opposing, quarter-turned flights. The stair has ornamental wrought and cast iron railings with oak hand rails. The same railings are used on the mezzanine. A row of deep plaster beams crosses the lobby ceiling from front to rear, the sides of the beams ornamented with patterns of fluting. Tall, narrow columns with fluted capitals engage the mezzanine at either end and support a central beam perpendicular to the others. Four handsome, original pendant light fixtures are suspended in the ceiling grid. Overall, the plaster walls in the lobby are incised to look like ashlar plaster and have plaster crown moldings. There is a tan glazed tile wainscoting around the lower walls and the floors are of red quarry tile. At the rear of the lobby on the mezzanine level is a segmentally-arched doorway with double French doors, sidelights and transoms. Other openings from the offices that surround the lobby are more utilitarian, with half-glazed wooden doors and wood or metal window sash. The head house originally contained the superintendent's office, laboratories, the operator control room, washrooms and other technical facilities, all with unornamented finishes. In the basement was a coal-powered boiler. Remaining on the third floor are the large wooden vats originally used to store bulk dry chemicals.

Extending from the head house at the second level is the operating floor, a platform the entire length of the rear wing. This extraordinary space is an extended arcade of plaster-molded segmental arches with pilasters marking the bays. Above the arcade on both sides is a clearstory of square windows and

segmental arches span the high ceiling from pilaster to pilaster. Like the lobby, the operating floor has a glazed tile wainscot, above which the plaster is incised to look like ashlar stone, and the floors are of quarry tile. The railings that fill the opening of the arcade are the same ornamental iron and oak used in the lobby.

The operating floor on the west side looks into the filter gallery on the same level. The continuous space of the filter gallery has a two-way joisted concrete ceiling, glazed tile walls and a floor of red-colored concrete punctured by the rectangular openings of the filters.

On the east side, the first seven bays of the operating floor look down into the two-story pump room, which also has a two-way joisted concrete ceiling, glazed tile wainscot and quarry tile floors. The pumps are still in place, as is a large beam crane that runs the length of the pump room above the first level. Adjacent to the pump room, under the operating floor, is the pipe gallery, which has the same finishes.

The architectural quality of the new plant was remarked upon by a number of observers. As W. W. Chaffin, the engineer inspector for the PWA noted, usually water plants were plain brick buildings, but this one would "compare favorably with any in the country." The News and Observer remarked that "A stranger entering the new building may be expected to ask the way to the vaults, although he may wonder how Fort Knox and the government's gold got from Kentucky to the old Fayetteville Road." Commissioner of Public Works Roy L. Williamson remarked that the city had "built permanently" and expected the plant to serve the needs of the city for the next thirty years. ("Architecturally Impressive Building Scheduled for Completion in May," The News and Observer, 31 March 1940, p. 10).

The design of the plant building reflected standards of the 1930s for water treatment plants, particularly those constructed under Public Works Administration sponsorship. These typically had a head house which included administrative and laboratory functions and an extended wing behind the head house in which the operating floor or corridor formed a spine flanked by filter tanks and pumping equipment. There is a remarkable similarity in design for many of these operating floors, which often assume the form of a long arcade with clearstory windows and a high degree of architectural finish. These are unusually fine spaces created for the appreciation of at most a handful of people involved in working the plant. While the interior arrangements of the buildings are fairly consistent, the exteriors are done in a variety of architectural styles, the preferred modes being the Colonial Revival or a stripped-down, geometricised classicism with overtones of the Art Deco/Art Moderne like the E. B. Bain Plant. In North Carolina, a water treatment plant that is stylistically very similar to the Raleigh plant, though much smaller, was built in Rocky Mount in 1935. This plant even has the blind arcading around the base of the sedimentation basins that is found in Raleigh (Short and Stanley-Brown, Public Buildings, p 484).

The water treatment plants constructed under the PWA represent a high-quality blend of public utility engineering and architecture that is characteristic of the period. As a survey of PWA-funded buildings noted, "The greatest architectural

advance has been made in the designing of utilitarian buildings, such as those connected with sewage and garbage-disposal plants and water-supply systems, which in former times were invariably ugly but which in many cases in the past 6 years have become structures of great aesthetic merit" (Short and Stanley-Brown, p. II).

The E. B. Bain Plant is an excellent example of the high level of design for utilitarian structures produced under PWA sponsorship. Its exterior is a carefully-detailed composition of well-balanced masses that combine economically to give rhythm, grace and a sense of majesty to the structure. The interior finishes of the lobby and operating floor are on a par with the better public buildings constructed in North Carolina during the period, and the operating floor, with the adjacent volumes of the pump room and filter gallery, constitutes one of the finest interior spaces in Raleigh. And all of the aesthetic elements were integrated without in any way impairing the functioning of the water treatment plant.

#### **E. Historical significance.**

From 1940 to 1967, the E. B. Bain Water Treatment Plant represented the sole source of treated water for Raleigh and its suburbs. The first truly modern water treatment and pumping facility for the city, its ability to provide a steady supply of clean water made possible the rapid Post-War expansion of Raleigh.

The first water treatment plant for Raleigh was built in 1887 on Fayetteville Road at the edge of Walnut Creek, from which the city's water supply was drawn. It was constructed by the private Raleigh Water Company, under a franchise granted by the city. However, the Raleigh Water Company experienced financial difficulties and was taken over by the Wake Water Company in 1901. The Wake Water Company in turn became insolvent, and in 1913 the City of Raleigh acquired the water system through arbitration (Wray, Wake County Water Use Study, p. 48).

Over the next thirty years, the water system and treatment facilities were expanded as the population of Raleigh and the demand for water grew. Additional sources of water were developed through the construction of a series of reservoirs, first Lake Raleigh in 1914, then Lake Johnson in 1923. In the early 1920s the water treatment plant at Walnut Creek was expanded to handle the additional water flow, which by 1925 had reached 4 million gallons a day. A further supply of raw water was added when Swift Creek was tapped at Rand's Mill ("Filtration Plant is City Saga," The Raleigh Times, 18 June 1940, p. 8).

By the 1930s, though there appeared to be an adequate supply of raw water, demand was outstripping the ability of the existing plant to treat it, or to provide a sufficient flow during hot weather or emergencies. The city's residential area was expanding steadily, and there was an increase in the use of air-conditioning equipment, which at that time required large amounts of water, in the city's business district. During hot weather in May of 1938, daily demand on the system reached the entire 5 million gallon capacity. Clearly, something had to be done. Three options presented themselves to city officials: postpone building until more water was absolutely necessary; reduce demand by cutting off the water supply to

areas not incorporated into the city; or build a new plant with federal Public Works Administration funding. The latter course was decided upon and plans for a new plant were quickly pushed to completion.

The Public Works Administration provided a grant for 45 percent of the approximately \$700,000 cost of the new plant and improvements to the water supply system, including additional supply lines and a new water tank on Chamberlain Street, the only existing tank being a 600,000 gallon structure behind St. Mary's School. City voters approved a bond issue for the remainder ("New Water System Looks to Future Development of Raleigh," The News and Observer, 18 June 1940, p. 13).

The construction trades and related industries were particularly hard-hit by the Great Depression. To aid them, Congress in 1933 created a Public Works Administration (PWA) to fund federal and nonfederal construction projects of public benefit. State and local applicants could seek grants of up to 45 percent and loans of up to 70 percent of the project cost. Between 1933 and 1939, the PWA helped in the construction of about 70 percent of the nation's new educational facilities; 65 percent of its sewage disposal plants; 35 percent of its hospital and public health facilities; and 10 percent of all roads, bridges, subways and similar engineering structures. Historian Arthur Schlesinger, Jr., has written that the PWA left behind "a splendidly-improved national estate" (Craig, Lois, The Federal Presence, pp. 346-347).

Contracts for the new plant were let on July 5, 1939. Work actually began on July 10, but the removal of numerous pipe line valves delayed construction until September of 1939 ("Contractor Praises City Project," The Raleigh Times, 18 June 1940, p. 9). The plans and specifications were drawn up by Raleigh engineer William C. Olsen. L. E. Wooten and J. R. Cook were the resident engineers who supervised construction. The general contractor for the treatment plant was A. H. Guion of Charlotte. By late spring of 1940, the plant was operational. It was dedicated by Raleigh mayor Graham Andrews on June 18, 1940, in the name of Ernest Battle Bain ("City's Water Plant is Engineering Feat," The Raleigh Times 18 June 1940, p. 9.).

E. B. Bain was first associated with the city's water supply when he came to work for the Raleigh Water Company in 1897, becoming the manager of the Walnut Creek plant in 1899 and the general superintendent of the system in 1900. When the Wake Water Company took over, he remained as superintendent. And in 1913, when the city acquired the system through arbitration, Bain was retained in the superintendent position. When the plant was dedicated, Bain was 72 and had acted as superintendent of the water works for forty years, excepting a few years under a recent administration ("New Water Works Given Name of Ernest B. Bain," The News and Observer, 19 June 1940, p. 16).

The new water treatment plant incorporated both water filtration and pumping in one structure. Four electric pumps originally provided the power to force water through the city's 134 miles of mains, with an additional, gasoline-powered auxiliary pump in reserve. While the plant was rated at 8 million gallons a day, it



could actually filter and pump nearly 10 million gallons and was designed to be expanded in units of a million gallons up to 20 million gallons a day ("City's Water Plant is Engineering Feat," The Raleigh Times, 18 June 1940, p. 9). Remarkably, although the new plant was built on the same site as, and incorporated parts of, the existing water treatment plant, there was no interruption in service, either during construction or at the changeover.

During the late 1940s and early 1950s, water was again in short supply and ordinances were passed by the City Council that limited the use of water. As provided for in the original design of the E. B. Bain plant, it was expanded in 1951 to increase its water treatment capacity to 13 million gallons a day. In 1952 the size of Lake Johnson was increased and plans were made to create Lake Benson upstream from the Old Rands Mill Dam. Plans for Lake Wheeler were completed in 1956 (Wray, p. 48).

Despite these efforts, Raleigh had again outgrown its water supply by the early 1960s. The treatment capacity of the E. B. Bain plant was unable to meet demand during peak usage periods. Plans and specifications were prepared for a new water treatment plant on the Neuse River, the E. M. Johnson Plant, which was put into operation in the summer of 1967 (Wray, p. 49). Falls of the Neuse Reservoir was created in the mid-1970s.

The E. B. Bain and E. M. Johnson plants worked in tandem until July of 1987, when the E. B. Bain plant was taken out of service. Since that time, and until recently, the clear storage tanks at the E. B. Bain plant have been used for backup storage of water treated at the E. M. Johnson Plant.

## **Bibliography**

"Architecturally Impressive Building Scheduled for Completion in May," The News and Observer, 31 March 1940, p. 10.

"City Rushes Water Plant Plans to Beat Deadlines," The News and Observer, 2 August 1938, p. 16.

"City's Water Plant Is Engineering Feat," The Raleigh Times, June 18 1940, p. 8.

"Filtration Plant is City Saga," The Raleigh Times, 18 June 1940, p. 9.

"Low Bids Save City Tidy Sum," The News and Observer, 24 November 1938, p. 18.

"New Water Plant Has Million Gallon Customers," The News and Observer, 20 July 1940, p. 12.

"New Water System Looks to Future Development of Raleigh," The News and Observer, 18 June 1940, p. 13.

"New Water Works Given Name of Ernest B. Bain," The News and Observer, 19 June 1940, p. 16.

"Raleigh's New Water Plant Takes Shape," The News and Observer, 31 March 1940, p. 10.

Craig, Lois. The Federal Presence-Architecture, Politics and Symbols in United States Government Building. Cambridge, Massachusetts: MIT Press, 1978.

Short, C. W. and Stanley-Brown, R. Public Buildings-A Survey of Architecture of Projects Constructed by Federal and Other Governmental Bodies Between the Years 1933 and 1939 with the Assistance of the Public Works Administration. Washington, D. C.: Government Printing Office, 1939.

"Water Plant Will Cost an Estimated \$699,633," The News and Observer, 13 August 1938, p. 12.

Wray, John D. Wake County Water Use Study . Raleigh: Board of Water and Air Resources, State of North Carolina, 1970.

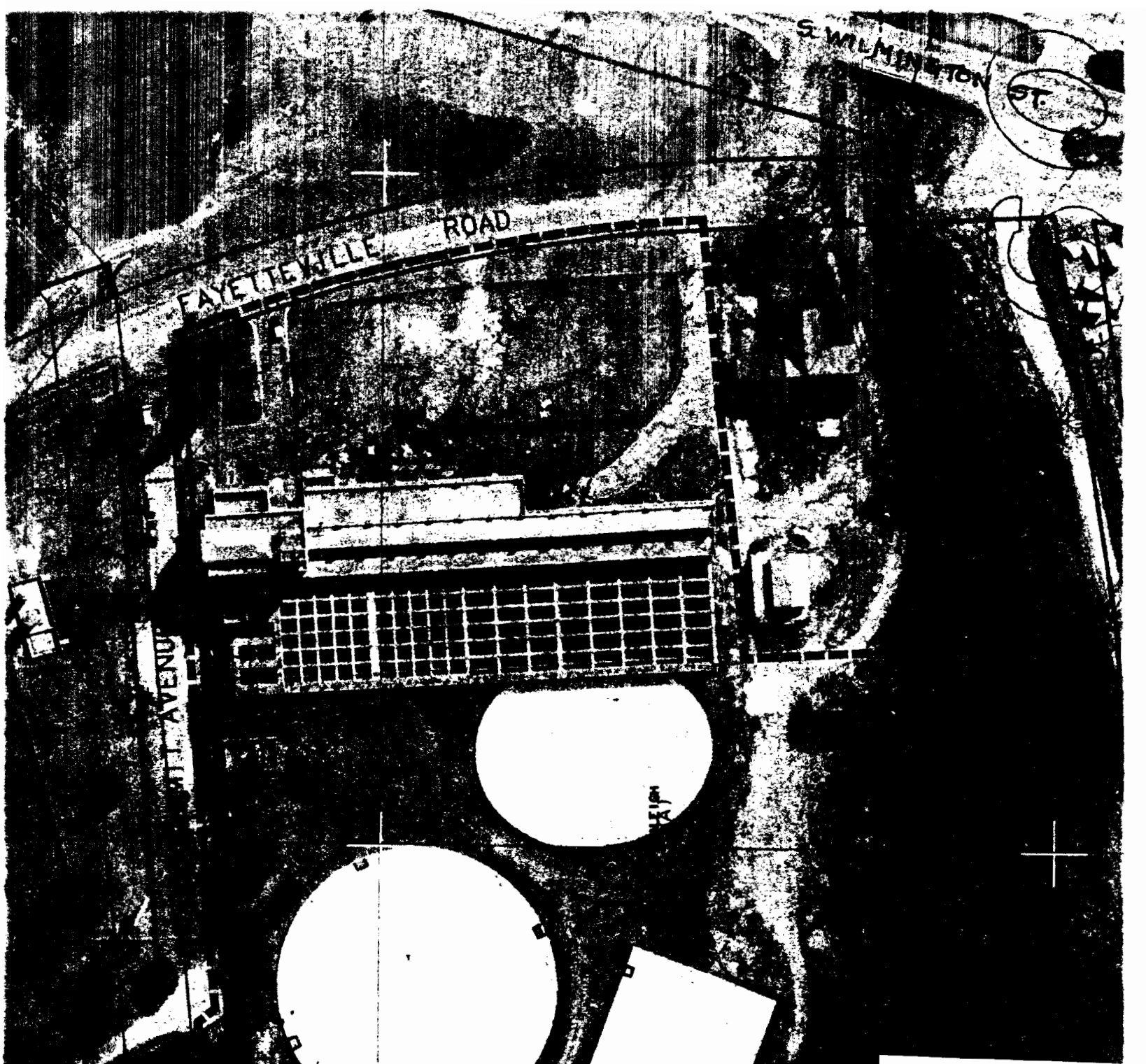
**WAKE COUNTY HISTORIC PROPERTY DESIGNATION APPLICATION FORM  
E. B. Bain Water Treatment Plant**

**Addendum**

**C. Justification for area to be designated.**

The area to be designated includes the tract on which the E. B. Bain plant was constructed, minus two small sections at the south end occupied by the 1887 water treatment plant and a modern building that is part of the sewage treatment system. This sloping, grassy site south of downtown incorporates all of the structures originally associated with the water treatment plant and provides an appropriate setting for them.

Addendum: The area to be designated shall also include the interior of the E. B. Bain Water Treatment Plant, more specifically the two story lobby, the second floor hallway leading to the operating floor overlook, and the operating floor. These spaces comprise the areas of the plant that were accessible to, or could be viewed by, the general public. They feature a level of architectural sophistication and finish that is uncommon for many industrial plants; however, they are emblematic of design standards for similar water treatment plants of the 1930s.



**E. B. Bain Water Treatment Plant**  
1810 Fayetteville Road  
Raleigh

Wake County Map 1703.19



