COMMENT ON NATIONAL REGISTER NOMINATION

ADDRESS: 4101 N DELAWARE AVE, Richmond Station, Philadelphia Electric Company

OVERVIEW: The Pennsylvania Historical & Museum Commission (PHMC) has requested comments from the Philadelphia Historical Commission on the National Register nomination of 4101 N. Delaware Avenue located in Northeast Philadelphia and historically known as the Richmond Station, Philadelphia Electric Company. PHMC is charged with implementing federal historic preservation regulations in the Commonwealth of Pennsylvania, including overseeing the National Register of Historic Places in the state. PHMC reviews all such nominations before forwarding them to the National Park Service for action. As part of the process, PHMC must solicit comments on every National Register nomination from the appropriate local government. The Philadelphia Historical Commission speaks on behalf of the City of Philadelphia in historic preservation matters including the review of National Register nominations. Under federal regulation, the local government not only must provide comments, but must also provide a forum for public comment on nominations. Such a forum is provided during the Philadelphia Historical Commission's meetings.

The nomination for Richmond Station contends the property is significant under Criteria A and C. The nominated parcel includes 11 buildings and structures, with the majority being contributing resources. The property is significant under Criterion A in the area of Engineering, as one of the most important central power stations built in the United States in the decade following World War I. In 1925, the time of its completion, it was both the largest and most efficient power plant in the world. The period of significance under Criteria A begins in 1925, when the station was completed and went into operation, and ends in 1967 when coal-powered steam plants began to lose favor after Philadelphia Electric opened its first nuclear power plant and started to prioritize that power source.

The Richmond Station is also locally significant under Criterion C in the area of Architecture, as an outstanding example of the Beaux Arts style applied to a monumental example of a type, the power station, and the work of a master, John T. Windrim, the preeminent civic architect of early twentieth century Philadelphia. The period of significance under Criteria C begins in 1923, when construction began, and ends in 1936, after the administration building and garage were built. After nearly a century, Richmond Station remains one of the most prominent landmarks along the Philadelphia waterfront, visible for miles up and down the Delaware River

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

Historic name: **Richmond Station, Philadelphia Electric Company**
Other names/site number: Richmond Generating Station, Richmond Power Station
Name of related multiple property listing**:**

(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: **4101 North Delaware Avenue**
City or town: **Philadelphia** State: **PA** County: **Philadelphia**
Not For Publication: ☐ Vicinity: ☐

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this ___ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___national ___statewide ___local

Applicable National Register Criteria:

___A ___B ___C ___D

Signature of certifying official/Title: **Date**

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official: **Date**

Title : **State or Federal agency/bureau or Tribal Government**

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) _____

_____

Signature of the Keeper Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private:	[X]
Public – Local	[ ]
Public – State	[ ]
Public – Federal	[ ]

Category of Property

(Check only **one** box.)

Building(s)	[ ]
District	[X]
Site	[ ]
Structure	[ ]
Object	[ ]

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
8	1	buildings
0	0	sites
1	1	structures
0	0	objects
9	2	Total

Number of contributing resources previously listed in the National Register 0

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6. Function or Use
Historic Functions
(Enter categories from instructions.)

INDUSTRY/PROCESSING/EXTRACTION – Power Plant

Current Functions
(Enter categories from instructions.)

VACANT/NOT IN USE

7. Description

Architectural Classification
(Enter categories from instructions.)

Beaux Arts

Materials: (enter categories from instructions.)
Principal exterior materials of the property: **Reinforced Concrete, Brick, Glass**

Narrative Description
(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with **a summary paragraph** that

briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

The Richmond Station of the Philadelphia Electric Company is a monumental electrical generating station situated on the west bank of the Delaware River in Northeast Philadelphia. The approximately 31-acre site (**Figure A**), located in the Port Richmond neighborhood, is loosely bounded by the Delaware River to the east, the Delair Railroad Bridge to the north (built by the Pennsylvania Railroad in 1895-1896 and now owned and operated by Conrail/CSX), North Delaware Avenue to the west, and a city-owned sewage treatment facility to the south. Built by the Philadelphia Electric Company between 1923 and 1925, the station was designed in the Beaux Arts style by architect John T. Windrim and engineer William C.L. Eglin.

Figure A - Current aerial view, looking northwest (Pictometry, 2019)

The property contains nine contributing resources, the largest and most significant of which is the main Power Station, which is four stories tall, constructed of reinforced concrete, and consists of three components (from east to west): the Boiler House, Turbine Hall, and the Switch House. There are numerous ancillary structures, each of which is described in greater detail below. They include the Coal Tower, which stands on an approximately 400′-long pier that extends out into the river and connects to the Boiler House by way of a large, steel-framed coal conveyer; and the Screenhouse, a small, one-story structure that stands along the bulkhead just east of the Boiler House. The historic power station complex occupies only the northern third of the property. South of the Power Station, the site, which was historically used for the storage of

coal, is paved in asphalt and is now occupied by two substations with transformers and switching equipment as well as several shed-like structures and a large oil tank. The proposed National Register Boundary conforms to the historic parcel, which remains unchanged to this day, and includes all existing resources that were historically and functionally related to Richmond Station (**Figure B**).

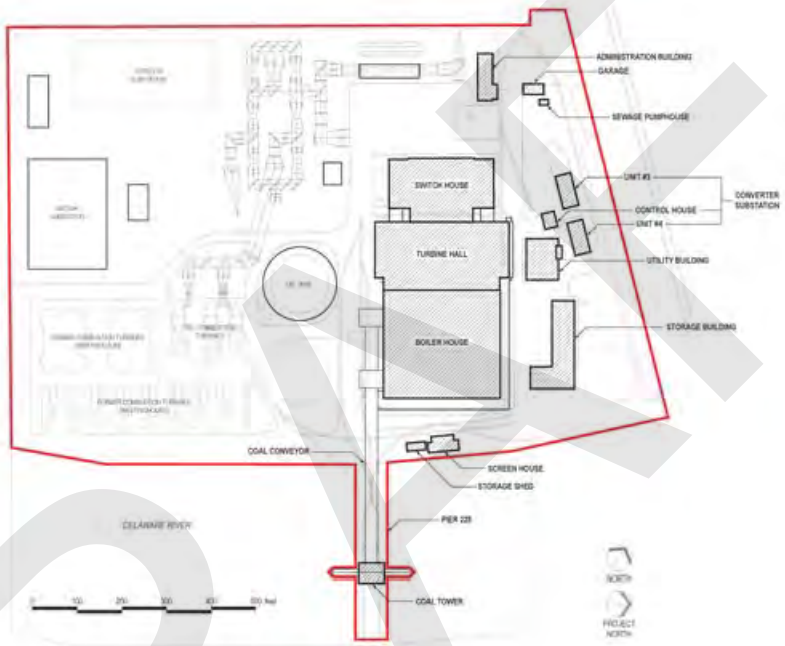

Figure B - Existing Site Plan with Building Dates and National Register Boundary

Power Station Year built: 1923-1925 1 Resource: Contributing

The site is dominated by the immense Power Station, which in total measures approximately 325’ by 550’ and is four stories tall. The building consists of three components: the Boiler House, Turbine Hall, and Switch House in an arrangement typical of early twentieth century electrical generating stations. The Power Station is constructed of reinforced concrete with a tinted, slightly textured lime-based wash, an original finish, applied to simulate the appearance of natural stone on the exterior.

Boiler House (exterior): The easternmost of the three sections is the Boiler House, which is roughly square in plan, measuring about 300’ by 300’, and stands on a one-story base. The east elevation, facing the river, is characterized by its broad, pedimented Roman temple front (**Photos1, 2**). The first floor has a rusticated treatment and contains a number of multi-light steel factory windows. The second floor also contains a multi-light window in each bay, though smaller than those on the first floor. The upper stories contain much larger, monumental steel factory windows that rise from the third floor to the fifth floor between pilasters that support the

entablature, pediment, and parapet. The north elevation is similar in treatment but does not contain a pediment (**Photo 3**). The south elevation is also similar in treatment but is largely blocked from view by the enormous, steel-framed coal conveyer and distribution structure, which is described in greater detail below (**Photo 4**). On the west side, the Boiler House abuts Turbine Hall.

The roof of the Boiler House is flat but contains an extensive array of structures and equipment. The most prominent features are the seven, approximately 80'-tall cylindrical metal exhaust stacks. The four stacks on the western half of the roof date to 1923-1925 and rise directly above the original boilers. The two stacks at the northeast corner were added when two new boilers were built in 1935 for the turbogenerator that went into service that year. The final stack, which is located just south of the central water tower (an original roof feature from 1923-1925), was added in 1950 when yet another new boiler was added to power the fourth and final turbogenerator that went into service that year. Due to the large size of the new boiler, it required the construction of a rooftop enclosure consisting of a large, approximately 30'-tall metal penthouse structure that covers a majority of the eastern half of the Boiler House roof. Other rooftop features include the large metal breechings (or ducts), which connect the boilers to the exhaust stacks above, as well as the long, sawtooth monitors located between and west of the four original exhaust stacks on the western half of the roof.

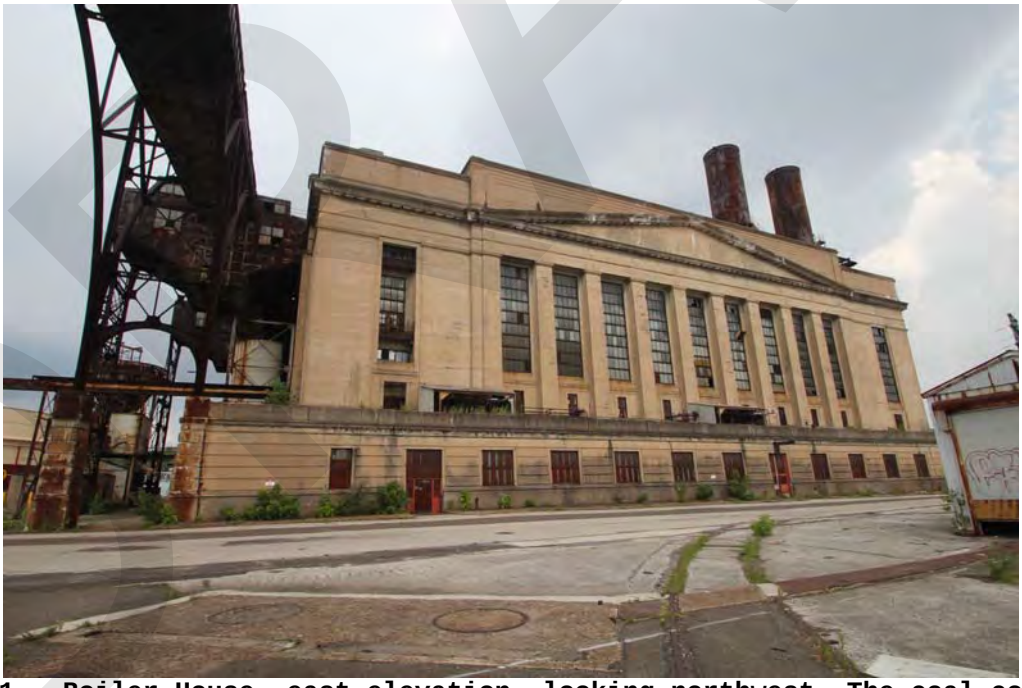

Photo 1 – Boiler House, east elevation, looking northwest. The coal conveyer is seen at far left.

Photo 2 – Boiler House, east and north elevations, looking southwest.

Photo 3 – Boiler House, north elevation, looking south.

Photo 4 – Boiler House, south and east elevations, looking northwest.

Turbine Hall (exterior): Located just west of the Boiler House, Turbine Hall is rectangular in plan, measuring approximately 150’ by 325’. The north and south elevations are virtually identical and are similar in treatment to the east elevation of the Boiler House (**Photos 5, 6**). Each side contains small, multi-light steel factory windows on the first and second floors and tall, monumental steel factory windows on the upper floors between the pilasters that support the entablature and pediment. The north and south elevations are topped by the vertical glazed sides of a barrel vaulted, steel-framed roof that covers the entirety of Turbine Hall. On the west elevation, only the northernmost and southernmost three bays, which are similar in treatment to the north and south elevations without pediments, are visible. The remainder of the north elevation abuts the Switch House.

Photo 5 – Turbine Hall, north elevation, looking southwest.

Photo 6 – Turbine Hall, south elevation, looking north.

Switch House (exterior): The smallest component of the Power Station, the Switch House is rectangular in plan and measures approximately 100’ by 270’. The west, north and south elevations are similar in treatment to the Boiler House and Turbine Hall (**Photos 7-9**). There are small, multi-light steel factory windows on the first and second floors and tall, monumental steel factory windows on the upper floors between the pilasters that support the entablature. Unlike the other two components, however, there are no pediments on either of the Switch House elevations. The only other notable difference is on the first floor of the west elevation, which contains the Power Station’s main entrance. The original doors have been replaced by a single-leaf metal door set within stucco infill, but the original pedimented concrete surround remains intact (**Photo 10**).

Photo 7 – Switch House, west elevation, looking east.

Photo 8– Switch House, north and west elevations, looking southeast.

Photo 9 – Switch House, south elevation, looking north.

Photo 10 – Switch House, main entrance on west elevation, looking east.

Boiler House (interior): On the interior, the Boiler House features concrete floors, walls and ceilings. The boilers, which consist of large rectangular concrete and steel structures that nearly fill the interior volume of the Boiler House, rise nearly to the top of the nearly 80'-high space (**Photos 11-13**). Near the north and south ends of each boiler house, there are "firing aisles"

where the boilers were controlled with a system of valves and levers. Along the perimeter of the boiler house, there is a network of concrete stairs and catwalks that provide maintenance access to the upper reaches of the boiler equipment.

Photo 11 – Boiler House interior, typical boiler equipment.

Photo 12 – Boiler House interior, typical boiler equipment.

Photo 13– Boiler House interior, typical firing aisle.

Turbine Hall (interior): Turbine Hall is the heart of Richmond Station, both functionally and architecturally. In this monumental, Roman bath-like space, which measures approximately 150' by 300', the electricity that powered much of the city was created by two enormous turbogenerators (later increased to four), which at the time of their installation were the largest ever assembled. Powered by steam created in the Boiler House, the spinning turbines generated electricity that was fed out to various substations via the Switch House. The space is capped by an enormous steel-framed, cross vaulted roof that rises about 150' above the ground floor. The vertical sides of the vault are glazed, while the vaults themselves consist of reinforced concrete and plaster panels over a steel frame. Many of the concrete and plaster panels have fallen to the main floor, although the steel framing of the vault remains intact.

The main operating floor of Turbine Hall is one level above the ground. The floor surface consists of concrete scored in a grid pattern and contains the four original turbogenerators, which alternate with five large, rectangular openings in the floor. These openings, which contain

painted, metal picket guardrails, look down to ground level where there are various metal stairs and catwalks to allow inspection and maintenance of the turbogenerators. The ground level also contains numerous below-grade basins in the floor. The basins were primarily used for water intake for the circulating pumps, which provided cooling water from the river to the turbines. The ground floor is currently flooded and was not accessible at the time of survey.

The east side of Turbine Hall consists of a peristyle-like wall of square concrete columns that are broken up into three groups – six in the center and two on either side – by sections of solid concrete wall (**Photo 14**). In front of each pier and the solid walls, there are steel columns that support the vaulted roof structure above, as well as a catwalk on all four walls, located just below the point where the vaulted roof begins (the catwalk is accessed from the Operating Room, described below). The heater gallery, which contains a number of large surge tanks and an ancillary operating room with glazed walls (the main Operating Room is located on the west wall, as described below), is located on the other side of the square piers (**Photo 15**).

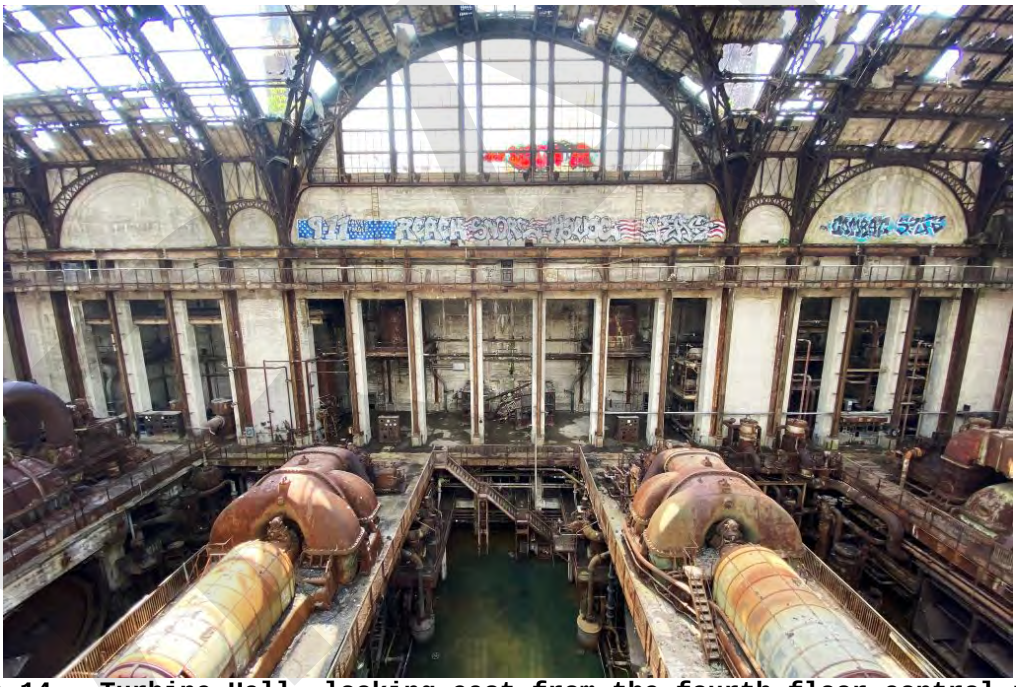

Photo 14 – Turbine Hall, looking east from the fourth floor control room.

Photo 15 – Turbine Hall, heater gallery, looking north.

The north and south sides of Turbine Hall are virtually identical, each containing five monumental, multi-light steel factory windows alternating with Doric order concrete pilasters (**Photos 16, 17**). Above the pilasters, the upper portion of the north and south walls consists of the glazed, vertical sides of the vaulted roof. The original rail crane, which rolls along tracks located on the east and west walls just below the vaulted roof, is currently located on the south wall. This crane was historically used to install the turbogenerators.

Photo 16 – Turbine Hall, main floor, looking southeast.

Photo 17 – Turbine Hall, main floor, looking northeast.

The west side of Turbine Hall is mostly solid in the center nine bays, which are punctuated by Doric order concrete pilasters partially obscured by the roof-supporting steel columns, similar to the columns on the east wall (**Photo 18**). At the center of the west wall, there is an arched opening with a multi-light steel transom, however the doors are currently blocked by metal security panels (the doors are, however, visible from the adjacent corridor as seen in **Photo 22**). This doorway leads directly into the second floor of the Switch House. Above the doorway is a three-sided, painted metal bay window, which overlooks the space from the top-floor Operating Room, where a team of engineers controlled the Power Station and could directly observe operations within Turbine Hall (**Photo 19**). On both sides of the bay window, there are additional multi-light steel windows. The three bays at the north and south ends of the west wall contain monumental, multi-light steel factory windows, similar to those found on the north and south walls.

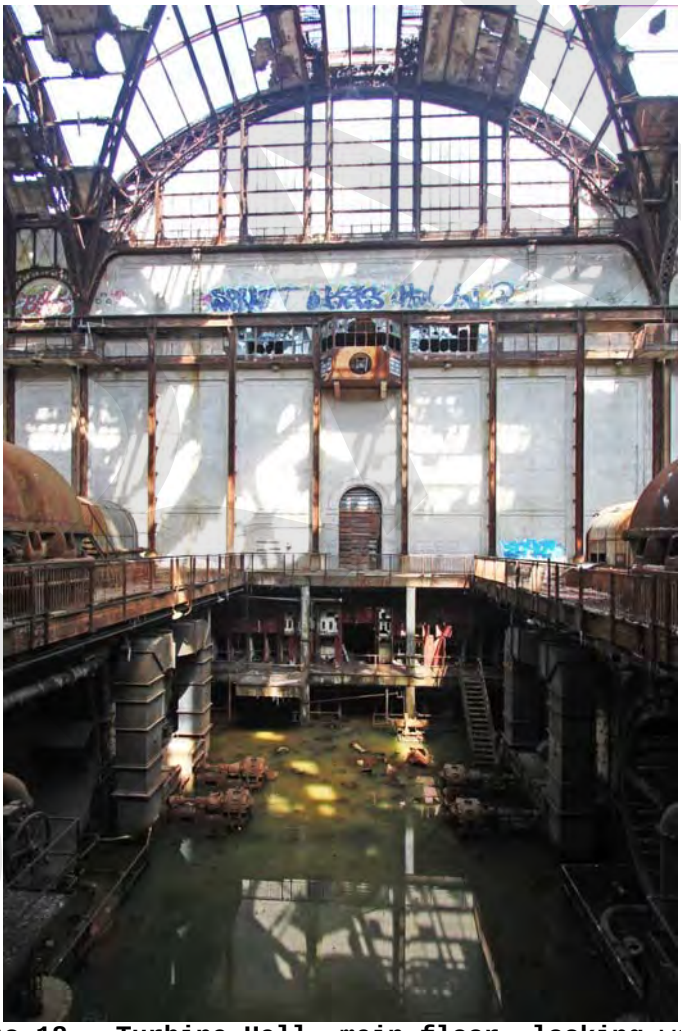

Photo 18 – Turbine Hall, main floor, looking west.

Photo 19 –Control Room on fourth floor, looking south.

Switch House (interior):
On all floors, the four-story Switch House contains a number of long, narrow spaces on either side of a center east-west corridor. On the first floor, the corridor is entered from a vestibule adjacent to the main entrance. Both the vestibule and the corridor on the first floor contain encaustic tile floors, wall paneling and door surrounds with a Greek key pattern (**Photo 20**). Nearly every other space contains exposed concrete floors, walls and beamed ceilings (**Photos 21-24**).

Photo 20 – Switch House, first floor vestibule, looking southeast.

Photo 21 – Switch House, second floor corridor, looking west.

Photo 22 – Switch House, second floor corridor, looking east to Turbine Hall.

Photo 23 – Switch House, second floor, looking north.

Photo 24 – Switch House, second floor, looking north.

Pier 225 Year built: 1923-1925 1 Resource: Contributing

The pier, which measures roughly 70’ wide by 400’ long, extends into the river from the bulkhead (**Photos 25, 26**). Built on pilings, the pier has a concrete surface with several embedded former rail lines. The pier also contains the Coal Tower, which is described in greater detail below.

Photo 25 – Pier 225, looking east.

Coal Tower Year built: 1923-1925 1 Resource: Contributing

Located on the pier about 225’ east of the bulkhead, the Coal Tower historically served as the receiving and processing center for the Power Station’s primary fuel source (**Photo 26, 27**). The building is rectangular in plan, measuring roughly 46’ by 64’, and is approximately 130’ tall. It is constructed of reinforced concrete and matches the spare Classical Revival treatment of the main Power Station. The base or first floor has a rusticated treatment, above which the plainly treated shaft rises three stories to a cornice. Above the cornice, there is an additional story – effectively

the parapet – which also has plainly treated wall surfaces. A simplified cornice tops the parapet, stepping upward to the steel-framed hipped roof, which is glazed.

On the east and west elevations, there are two openings on the first floor through which train cars would pass to deliver coal. Three bays of large, monumental steel factory windows rise from the second through the fourth floors on both sides, with metal loft doors in the outer bays on the second and fourth floors. Between these windows and the cornice, there are small, three-light windows. Within the "parapet" above the cornice, there are six-light steel factory windows in all three bays.

The north and south elevations are dominated by the steel boom hoists that extend out from the parapet level. These hoists were historically used to unload coal delivered to the site on barges. Just below the boom hoists, small crane operator compartments extend out from the building at about the third floor.

Photo 26 – Coal Tower at the end of Pier 225, west elevation, looking southeast.

Photo 27 – Coal Conveyor, looking south.

Screenhouse Year built: 1923-1925 1 Resource: Contributing

The Screenhouse is a small, one-story reinforced concrete structure with a flat roof. The building is located just east of the Power Station on the bulkhead (**Photo 28**). As its name suggests, this building was historically used to screen and filter water pumped in from the Delaware River before it made its way into the Boiler House. All elevations have a rustication treatment and simple cornice on all elevations. Each side also contains several relatively small window openings that are currently covered by metal panels. The main entrance, which consists of a single-leaf metal door with side lights and transom, is located on the west elevation.

Photo 28 – Screenhouse, north and west elevations, looking southeast.

Converter Substation Year built: 1932 1 Resource: Contributing

The Converter Substation was built in 1932 as part of Philadelphia Electric's contract to electrify the Pennsylvania Railroad between Philadelphia and New York City. The substation consists of one reinforced concrete building, the Control House, which is a contributing resource, and two metal sheds, which are uncounted structures. Like the Screenhouse, the Control House has a rustication treatment and simple cornice on all elevations (**Photo 29**). Each side also contains several relatively small window openings that are currently covered by metal panels. The only entrance, which consists of a single-leaf metal door with a transom, is located in the northernmost bay on the south elevation. The Control House has a flat roof. The metal sheds, known as Unit #3 and Unit #4 for the rotary frequency converter units they contain, are located directly to the north of the Control House. The sheds are long, narrow structures with curved roofs (**Photos 30, 31**).

Photo 29 – Control House, south and east elevations, looking northwest.

Photo 30 – Converter Unit #3, looking northwest.

Photo 31 – Converter Unit #4, looking northwest.

Administration Building Year built: 1936 1 Resource: Contributing

The Administration Building is a one-story, L-shaped building with a flat roof located adjacent to the main vehicular entrance near the northwest corner of the property (**Photo 32**). This vaguely Art Deco-style building is faced in buff brick with limestone sills and copings. The bays are separated by slightly projecting brick piers with limestone caps. Each bay contains either a window or a door, but all are later replacements dating to around 1980. Between the Administration Building and the adjacent Garage (described below), there are metal gates supported by brick piers with limestone caps, matching the exterior treatment of both buildings. The piers are original, but the gates appear to be recent replacements.

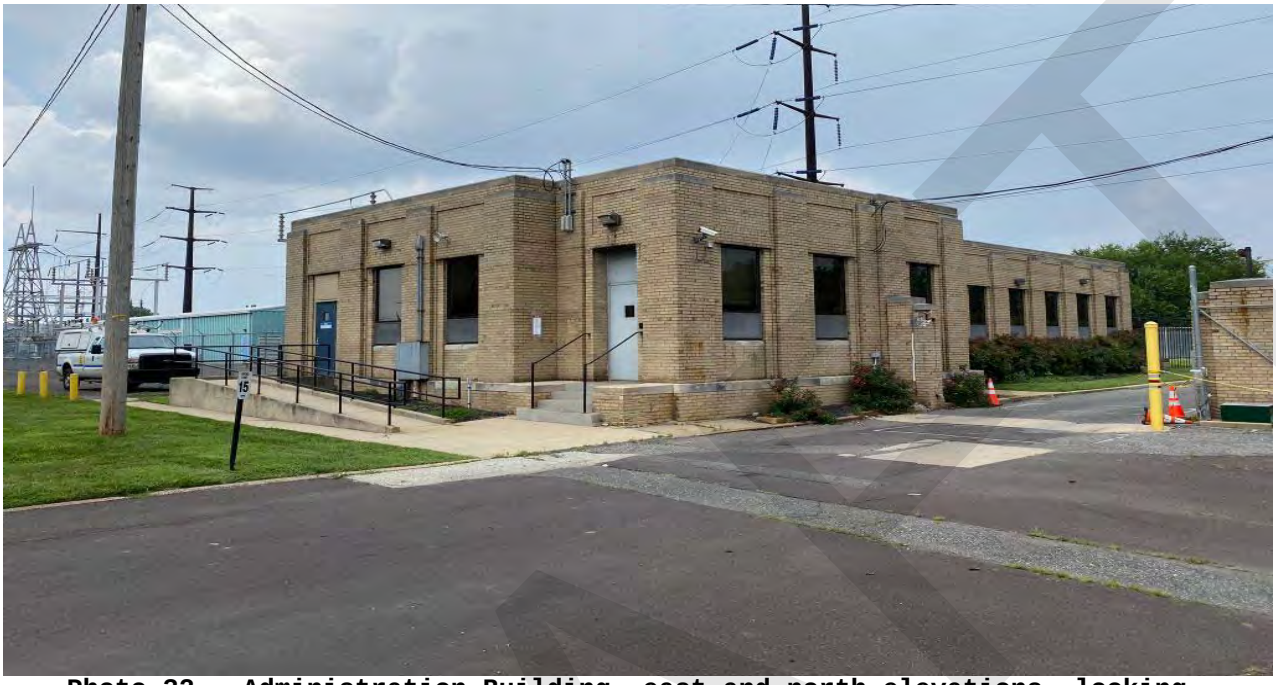

Photo 32 – Administration Building, east and north elevations, looking southwest.

Garage Year built: 1936 1 Resource: Contributing

Located just north of the Administration Building, the Garage is a one-story, four-bay structure of buff brick with projecting piers and limestone copings, matching the treatment of its neighbor (**Photos 33, 34**). The four garage doors are located on the west elevation. Between the Garage and the Administration Building (described above), there are metal gates supported by brick piers with limestone caps, matching the exterior treatment of both buildings. The piers are original, but the gates appear to be recent replacements.

Photo 33 – Garage, west and south elevations, looking southeast.

Sewage Pumphouse Year built: 1949 1 Resource: Contributing

The Sewage Pumphouse is a very small, one-story structure with a flat roof located just east of the Garage (**Photo 34**). The building is of buff brick with projecting piers and limestone copings, matching the treatment of its neighbors. There is one single-leaf metal door on the south elevation, but there are no other openings.

Photo 34 – Garage and Sewage Pumphouse, south and east elevations, looking northwest.

Utility Building Year built: 1955 1 Resource: Contributing

Located just north of Turbine Hall and southeast of the Converter Substation, the Utility Building is a two-story building of buff brick in the Modern style (**Photos 35, 36**). This predominantly masonry building contains several single-leaf metal doors and garage doors on the first floor, with bands of windows on the second floor on the east and west elevations. On the interior, there is a garage and storage spaces on the first floor while the second floor contains former employee locker rooms, bathrooms, and break spaces.

Photo 35 – Utility Building, west and south elevations, looking northeast.

Photo 36 – Utility Building, east elevation, looking west.

Storage Shed Year built: c. 1975 1 Resource: Non-Contributing

Located just south of the Screenhouse, the storage shed is a small, one-story metal structure (**Photo 37**). Due to its year of construction, which is outside the Period of Significance, it is non-contributing.

Photo 37 – Storage Shed, looking northwest from Pier 225.

Storage Building Year built: 1993 1 Resource: Non-Contributing

Located just north of the Boiler House and east of the Utility Building, the Storage Building is a one-story, L-shaped metal shed with a flat roof (**Photos 38, 39**). Due to its year of construction, which is well outside the Period of Significance, it is non-contributing.

Photo 38 – Storage Building, south and east elevations, looking northwest.

Photo 39 – Storage Building, north and west elevations, looking southeast.

Other Resources

The northern section of the property, which contains all of the counted resources described above, is separated from the southern section by a chain-link metal fence. The southern part of the site contains a variety of features, including two substations. The outdoor substation covers much of the western side of the site along Delaware Avenue between the Administration Building and the southern boundary, and consists largely of switching equipment and metal pylons carrying overhead lines. This area also contains several small, shed-like metal structures. The southern portion of the outdoor substation is in the same location as the original outdoor substation, however the existing equipment and shed structures are of more recent installation. The second substation, which was built by Amtrak in 2000, consists of a rectangular metal building with transformer equipment along the southern boundary. Immediately to the east of the Amtrak substation are numerous concrete pads where nineteen internal combustion turbines (installed in stages between 1968 and 1974) were historically located. Only three of the turbines remain, with the others having been removed in the 1990s. Just north of the turbines is a large metal oil tank that was installed around the same time (**Photo 40**). A second tank, located to the east of the existing tank, was removed in the 1990s.

Photo 40 – Site south of the Power Station.

Integrity

Richmond Station retains integrity in the aspects of design, materials, location, and setting. In terms of design and materials, both the overall form and the defining characteristics of the power station remain, including its reinforced concrete structure, tall metal stacks, and Classical Revival-style features including a consistent fenestration pattern, rusticated base, and cornice and pediment detailing, and the character-defining vaulted roof over the Turbine Hall. The quality, placement and condition of the construction materials, as well as the building's Classical Revival style are both highly characteristic of public utility buildings in Philadelphia during the early twentieth century. In regard to location and setting, the building maintains its highly prominent riverfront position and is a major landmark for miles up and down the Delaware River. Richmond Station continues to convey the major role that the Delaware River played in the history of Port Richmond, Philadelphia, and the surrounding Southeastern Pennsylvania region.

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [X] A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B. Property is associated with the lives of persons significant in our past.
- [X] C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark “x” in all the boxes that apply.)

- [ ] A. Owned by a religious institution or used for religious purposes
- [ ] B. Removed from its original location
- [ ] C. A birthplace or grave
- [ ] D. A cemetery
- [ ] E. A reconstructed building, object, or structure
- [ ] F. A commemorative property
- [ ] G. Less than 50 years old or achieving significance within the past 50 years

Areas of Significance
(Enter categories from instructions.)

ENGINEERING
ARCHITECTURE

Period of Significance

Under Criteria A 1925-1967
Under Criteria C 1923-1936

Significant Dates

N/A

Significant Person
(Complete only if Criterion B is marked above.)

N/A

Cultural Affiliation

N/A

Architect/Builder

John T. Windrim, Architect
William C.L. Eglin, Engineer

Statement of Significance Summary Paragraph

The Richmond Station of the Philadelphia Electric Company is significant under Criterion A in the area of Engineering, as one of the most important central power stations built in the United States in the decade following World War I. In 1925, the time of its completion, with an initial installation of two 50,000kw generators, it was both the largest and most efficient power plant in the world. Developed as a result of unrelenting growth in the demand for electricity during this period, the station was initially planned to be three times as large as it is today. Although the ambitious plans for its expansion were never realized, Richmond Station nonetheless became an essential link in the Philadelphia Electric system, providing electricity to hundreds of thousands of industrial, commercial and domestic consumers using what were the most powerful turbogenerators ever constructed for this purpose. The Richmond Station played a key role in powering some of the most important rail infrastructure on the east coast, including the electrification of the Pennsylvania Railroad between Philadelphia and New York City, part of a system-wide undertaking that was the "the most extensive electrification project in transportation history"[1] and, starting in 1929, for powering the vast, citywide network of trolleys and subways of the Philadelphia Rapid Transit Company. The period of significance under Criteria A begins in 1925, when the station was completed and went into operation, and ends in 1967 when coal-powered steam plants like Richmond began to lose favor after Philadelphia Electric opened its first nuclear power plant and started to prioritize that power source.

The Richmond Station is also locally significant under Criterion C in the area of Architecture, as an outstanding example of the Beaux Arts style applied to a monumental example of a type, the power station, and the work of a master, John T. Windrim, the preeminent civic architect of early twentieth century Philadelphia. Richmond Station was built by the Philadelphia Electric Company under the direction of architect John T. Windrim and engineer William C.L. Eglin between 1923 and 1925. Windrim, who had designed three earlier power stations for Philadelphia Electric – the Schuylkill, Chester and Delaware Stations – harnessed the architectural vocabulary of Ancient Rome to create an ennobling monument to electricity, one that was strategically used by Philadelphia Electric to help shape the company's image at a time when the public was increasingly critical of monopolized utilities. After nearly a century, Richmond Station remains one of the most prominent landmarks along the Philadelphia waterfront, visible for miles up and down the Delaware River. The period of significance under Criteria C begins in 1923, when construction began, and ends in 1936, after the administration building and garage were built.

[1] Westinghouse Electric & Manufacturing Company, "The Pennsylvania Railroad Electrification," (East Pittsburgh, PA, 1936).

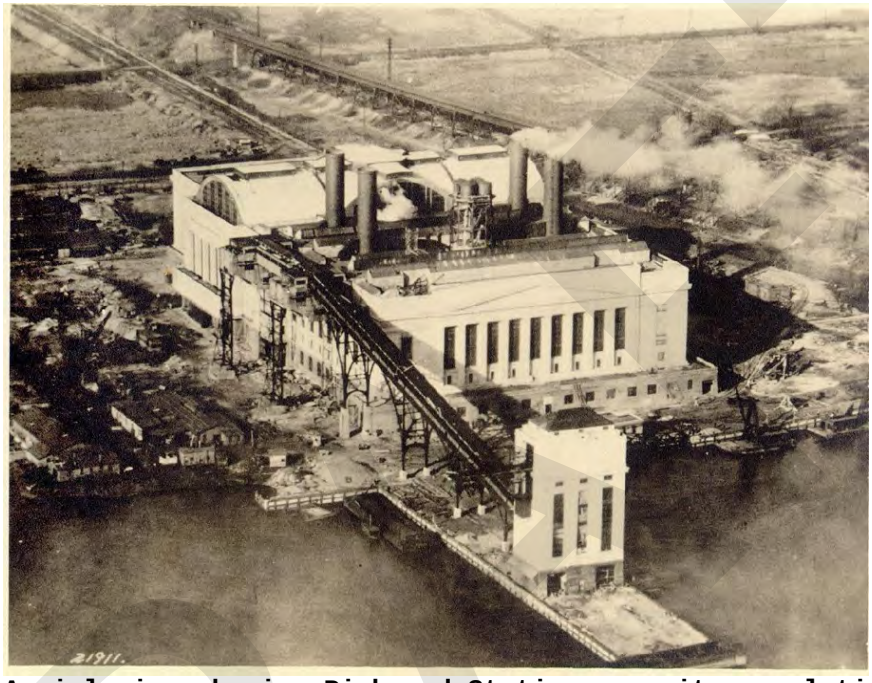

Figure C– Aerial view showing Richmond Station upon its completion in 1925 (Athenaeum of Philadelphia).

Narrative Statement of Significance

The Philadelphia Electric Company: Early History

Founded in 1899 and incorporated in 1902, the Philadelphia Electric Company formed as a means of consolidating many small electric utilities under a single large holding company. Since 1881, when the Brush Electric Light Company began supplying the first electric service in Philadelphia, 26 such utilities had emerged in neighborhoods across the city, usually to generate power for a particular building, service, or mode of transit and not as general service providers. Brush, for example, was founded primarily to install and supply power for new electric streetlamps along Chestnut Street in Center City. The Edison Electric Light Company of Philadelphia, on the other hand, primarily supplied electricity to consumers who desired to replace gas lighting in their homes or businesses with Edison's patented incandescent lamps.

The consolidation of Brush, Edison, and the other companies in 1899 was meant to eliminate wasteful competition and to create a standardized, citywide electrical grid. Philadelphia Electric faced enormous challenges in accomplishing this task. At the time of consolidation, the city's many small plants were "equipped with machinery of all sorts," as company historian Nicholas

B. Wainwright explains, some of which "supplied direct current and some alternating current, those furnishing alternating current having different voltages and frequencies from their neighbors."[2] Much of this equipment was also soon to be obsolete and insufficient to provide service to an ever-expanding customer base, numbering 8,145 by 1900. In order for Philadelphia Electric to succeed as the city's sole electric utility, it was imperative to create a more efficient system supplying a uniform current throughout the service area.

The immense project of standardizing Philadelphia's chaotic electrical system fell on William C.L. Eglin (1870-1928), a Scottish immigrant and engineer whose career began in 1889 when he became a dynamo tender at the Edison company's Sansom Street Station in Center City. Rising quickly through the ranks, Eglin eventually became head of the Electrical Department, effectively leading the Edison station's day-to-day operations. Following the formation of the Philadelphia Electric Company, Eglin was appointed chief engineer, making him one of the most pivotal figures in the decades-long, system-building effort that would follow. In the words of one trade journal in 1910, "his work, after the consolidation of the various companies, required practically a rebuilding and rearranging of the entire system, in order that uniform service could be furnished throughout the city."[3]

Schuylkill, Chester and Delaware: Philadelphia Electric's First Central Stations
Under Joseph B. McCall, who was elected as the first president of Philadelphia Electric in 1899, Eglin formulated an engineering plan and made great strides at standardizing service between 1902 and 1907.[4] A significant milestone in the effort to standardize the system after 1899 was the construction of a large, centralized plant, one that would be able to supply all of the electricity needed in the city at a lower cost than the many smaller, decentralized and less efficient plants. Around 1900, Philadelphia Electric purchased a tract of land on Christian Street at the Schuylkill River, and in 1902 began construction on what has been described as the largest coal-powered central power plant in the world, known as Schuylkill A-1.[5]

Designed under the direction of Eglin and architect John T. Windrim, the station had an initial rating of 81,000 kilowatts, a capacity that few in Philadelphia believed would ever be reached. Within only a few years, however, dramatic growth in the city's electrical load demanded that the station be expanded with a new section, known as A-2.[6] The enlarged plant would serve a growing number of customers, which had reached 22,973 by 1907, and would satisfy new contracts with the Pennsylvania Railroad in their efforts to electrify certain suburban lines. Construction on A-2 began in September of 1913 and was complete by 1915. At this point, the Schuylkill site, now capable of generating 130,000 kilowatts, was developed to its maximum

[2] Wainwright, 70.
[3] Aaron V. Wunsch, *Palazzos of Power: Central Stations of the Philadelphia Electric Company, 1900-1930* (New York, Princeton Architectural Press, 2016), 15-16; "W.C.L. Eglin," *Electrical Review and Western Electrician* 57, no. 21 (November 19, 1910): 1027.
[4] Wainwright, 70; 79.
[5] Wainwright, 73.
[6] Wainwright, 92; 113.

capacity.[7] To satisfy projected growth over the next few years, an even larger station would be needed.
By 1916, much of the increasing demand on the Philadelphia Electric system came from the area just south of the city, where World War I had stimulated the rapid development of industries such as shipbuilding, steel plants, and munitions factories. On Hog Island, in particular, now the site of Philadelphia International Airport, the Emergency Fleet Corporation built a shipyard that required an enormous amount of electricity. The shipyard employed 32,000 men and women, leading to a huge expansion in worker housing that further increased demand. As a result, McCall and Eglin agreed that a major new power station would be required in the city of Chester, Delaware County, to forestall the power shortages that would inevitably occur if nothing were done.[8] Major shortages had already occurred in the load area supplied by Schuylkill A-1 and A-2. Acknowledging the critical need to expand, the Philadelphia Electric board in September of 1916 authorized the purchase of land and the construction of a new 120,000kw station on the Delaware River in Chester, at a cost of $5,500,000. Known as the Chester Waterside Station, the plant's first turbine began operating in October 1918 and the building was largely complete by the following year. Due to its vast size and capacity, the company believed that it would satisfy demand at least through 1919.[9]

After the United States entered World War I in April 1917, Philadelphia experienced even greater industrial expansion, particularly in the areas of shipbuilding, locomotive manufacture, textiles, and the production of rifles, munitions, and other provisions for combat. So great was Philadelphia's contribution to the war effort, in fact, that the city became known as the "Arsenal of America."[10] This extraordinary growth demanded enormous amounts of electricity, so much, in fact, that the load threatened to overwhelm the Philadelphia Electric system. While the company initially believed that the new Chester station would satisfy all demand through 1919, growth was increasing so rapidly that McCall and Eglin began to plan for the construction of yet another large central station to ensure that the company could meet demand.

Due to the significant concentration of textile-related industries in the Kensington area of Philadelphia, along with the shipyards and other factories in adjacent Fishtown, a site northeast of Center City along the Delaware River was thought most suitable for expansion. It was there that demand was most acute and there that Philadelphia Electric had for years expected to build a central station, as evidenced by the company's prior purchase of the site on Beach Street in 1913. The opening in 1917 of the company's primary coal yard on Petty's Island in the Delaware River, just across from Fishtown's shipyards, also made the Beach Street site a logical choice. Philadelphia Electric embarked on the construction of the new central station in Fishtown – to be known as Delaware Station – in September 1917.[11] Like its predecessors, the Schuylkill and Chester stations, the new Delaware Station would be designed by Windrim and Eglin. Stone &

[7] Wainwright, 110.
[8] Matthew Sneddon and Aaron Wunsch, "Chester Waterside Station," Historic American Engineering Record (HAER), No. PA-505, 1998, p. 20.
[9] Wainwright, 130.
[10] Wainwright, 132
[11] Wainwright, 131.

Webster, a national engineering and construction firm based in Massachusetts, were hired as the general contractors for the project, which would cost the enormous sum of $24,500,000. After a series of years-long delays – a shortage of steel during the war led Windrim and Eglin to redesign the structure to use reinforced concrete – the station was fully operational by 1923.[12]

Although the new Delaware Station was initially expected to satisfy peak loads from ramped up wartime manufacturing, the war ended sooner than anticipated in November 1918. Despite the unexpected drop off in the manufacture of arms, the coming "domestic revolution" would bring its own challenges, including frequent outages. With the proliferation of electrical appliances such as washing machines, refrigerators, irons, and radios, along with rapid housing development and the company's "Wire Your House" campaign, begun in 1916, Philadelphia Electric experienced unprecedented growth in residential service after World War I. By 1918, the company had 103,015 customers, a nearly fivefold increase since 1907. This figure nearly tripled over the next five years, reaching 305,644 by 1923. Although Delaware Station would still be needed to serve the ever-expanding textile district in Kensington, its purpose now would be not only to power industry, but also to provide electricity to an ever-increasing number of homes. At full capacity, Delaware Station's six turbogenerators had a rating of 180,000kw, which came in at about 46% of the city's peak load, but those peak loads continued to rise.[13]

Due yet again to constant, rapid growth, Philadelphia Electric began planning an even larger station, approximately three miles northeast of Delaware Station, to keep up with demand even before Delaware Station was completed. In 1923, the company purchased 31 acres of ground on the Delaware River between Lewis Street and Wheatsheaf Lane in the Port Richmond neighborhood (**Figure D**).[14] (A second, 30-acre parcel, which was separated from the main property by a city-owned plot that later became a sewage treatment plant, was included with the sale in 1923. Philadelphia Electric did not use this parcel until 1952 when it became part of the company's primary coal yard). Windrim and Eglin once again teamed up to design the new building, which was to be known as Richmond Station. When it was first announced in 1924, the building hailed by the *Philadelphia Inquirer* as what would be "the world's greatest power station."[15]

[12] FOOTNOTE
[13] Wainwright, 148-150.
[14] Wainwright, 152.
[15] "Greatest Power Plant in World to be Built Along Delaware River," *Philadelphia Inquirer* (April 10, 1924).

Figure D – Bromley Atlas of Philadelphia, 1925. Except for the Screenhouse and Coal Tower, all of the small structures surrounding the Power Station, including the cafeteria, appear to have been built for temporary use during construction and no longer exist. This map was made just prior to the completion of Richmond Station.

The first phase of Richmond Station – the northernmost of what would effectively be three separate but interconnected power stations, each with twelve boilers and four turbogenerators – went into operation in November 1925. An initial installation of two 50,000kw generators, the largest yet in operation anywhere in the world, brought the total initial capacity of the station to 100,000kw. These units were later upgraded to 60,000kw each. The new station was the most efficient in the Philadelphia Electric system and one of the most efficient plants in the world, reducing fuel consumption to the lowest that had been attained up to that time. This allowed the company to make four voluntary rate reductions over a period of four years, according to its own literature. These achievements were so notable that Richmond Station garnered attention from numerous national publications, including lengthy and lavishly illustrated features in *Electrical World*, *Engineering News-Record*, and *Power Plant Engineering*, among others, in 1926 (**Figure E**).[16] The same year, Philadelphia Electric published its own twenty-page booklet describing and illustrating the building and touting its technological innovations.

[16] William C.L. Eglin, "System Aspects of Richmond Station;" Farley C. Ralston, "Features of Richmond Station;" E.L. Hopping, "Mechanical Design of Richmond;" R.A. Hentz, "Electrical Features of Richmond;" and N.E. Funk, "Past Operating Experiences Affect Design of Richmond," all in *Electrical World*, vol. 87, no. 18 (May 1, 1926); also see Frank N. Kneas, "Architectural Development and the Use of Silicon Steel in the Richmond Power Station," *Engineering News-Record*, vol. 97, no. 12 (September 16, 1926); and "Richmond Goes on the Line with 100,000 Kilowatts," *Power Plant Engineering*, vol. 30 (May 15, 1926).

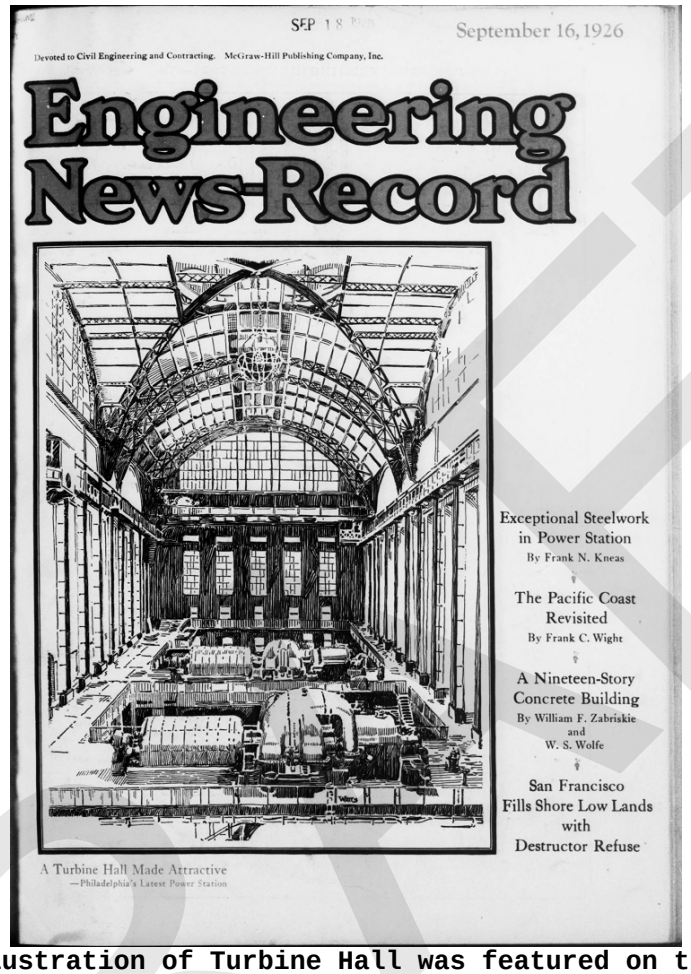

Figure E – An illustration of Turbine Hall was featured on the front cover of the September 16, 1926 issue of Engineering News-Record.

Richmond Station was planned to be much larger than what exists today. Original plans called for three separate but interconnected power stations totaling nearly 1000' in length (**Figures F and G**). However, almost as soon as the first two generators came online, demand for electricity in the Philadelphia Electric service area finally began to level off. This was due in part to the opening of the company's massive Conowingo Hydroelectric Plant in northeastern Maryland in 1928. The economic downturn of the Great Depression also affected demand, leading to a decline in the manufacturing sector and even the closure of several large plants powered by the Philadelphia Electric system, including that of A. Atwater Kent, the largest radio factory in the world. The downturn also led to falling transit ridership. Although in 1929 Philadelphia Electric had contracted with the Philadelphia Rapid Transit Company to power its vast, citywide network of trolleys and subways, demand proved to be far less than expected. While Philadelphia Electric was not crippled by the poor economy – there were no large-scale layoffs, and the company even added customers during 1930 and 1931 as air conditioning became commonplace – growth was effectively stalled, and the expansion of Richmond Station put on hold indefinitely.[17]

[17] Wainwright, 231-232.

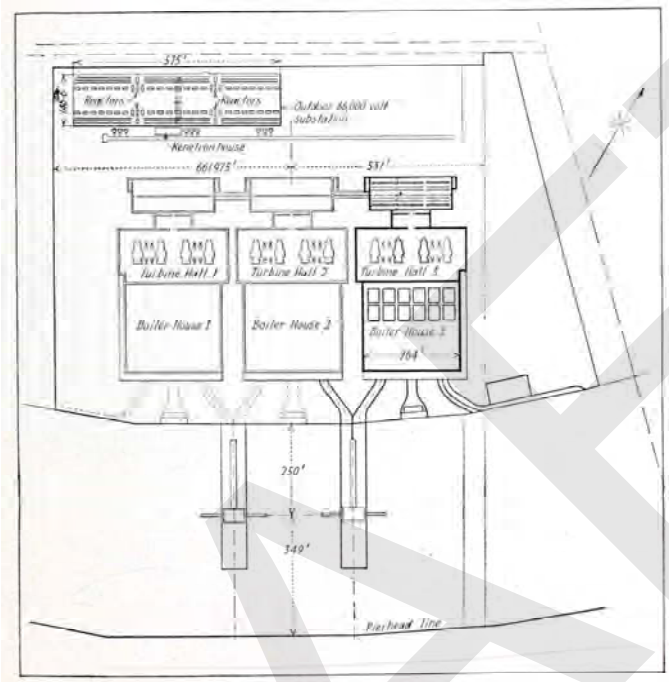

FIG. 17.—Layout of plant site for the 600,000-kw. Richmond station of the Philadelphia Electric Company.

Figure F – This diagram shows the original plan for Richmond Station comprising what were effectively three separate power stations, from Electric Power Stations by L.W.W. Morrow (1927). Only the northernmost of the three sections (at right) was completed.

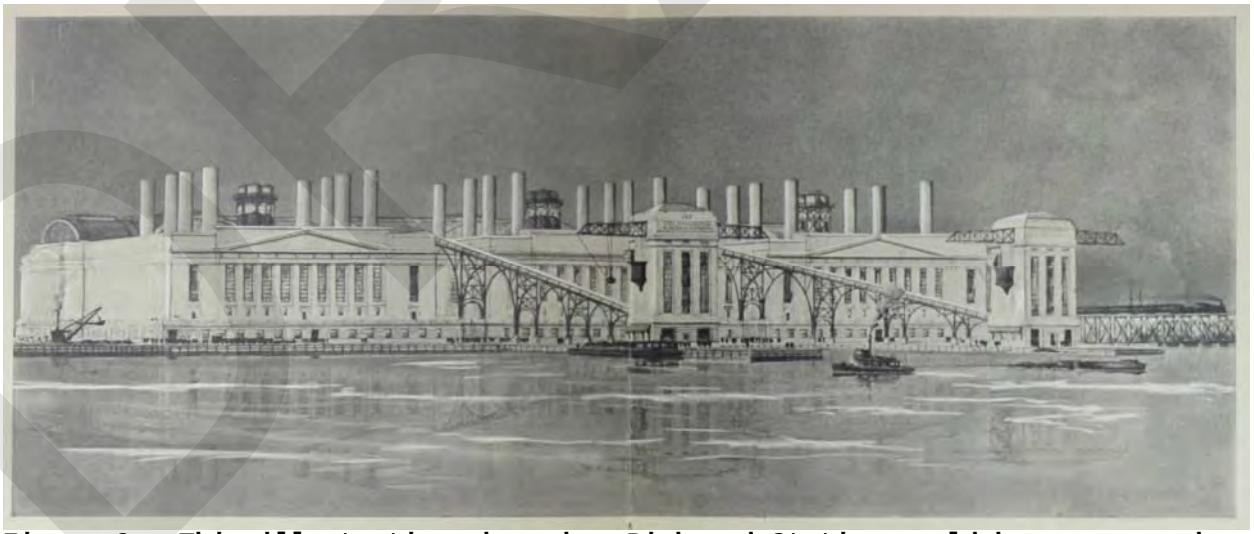

Figure G – This illustration shows how Richmond Station would have appeared from the river had the original plans been realized (from "Richmond Station," published by Philadelphia Electric in 1926). Only the northernmost section of the station (at far right) was completed.

While the grand plans for Richmond Station's expansion were never realized, the station was nonetheless destined to play a central role in the Philadelphia Electric system through the 1930s and beyond. In 1932, as part of the Pennsylvania Railroad's (PRR) electrification project, Philadelphia Electric built an on-site substation just north of Richmond Station – the Converter Substation, comprising the Control House and Frequency Converter Units #3 and #4 – specifically to convert voltage for the Railroad's exclusive use (**Figure H**). Although the PRR had begun to electrify its suburban Philadelphia lines as early as 1915, the remainder of the railroad was still powered by steam. In 1928, the PRR began "the most extensive electrification project in transportation history," relying on Philadelphia Electric in large part to make this happen. Electrification of passenger service between Philadelphia and New York, for which Richmond Station became principally responsible, was inaugurated in early 1933 and marked the completion of the first stage in the PRR's system-wide project.[18]

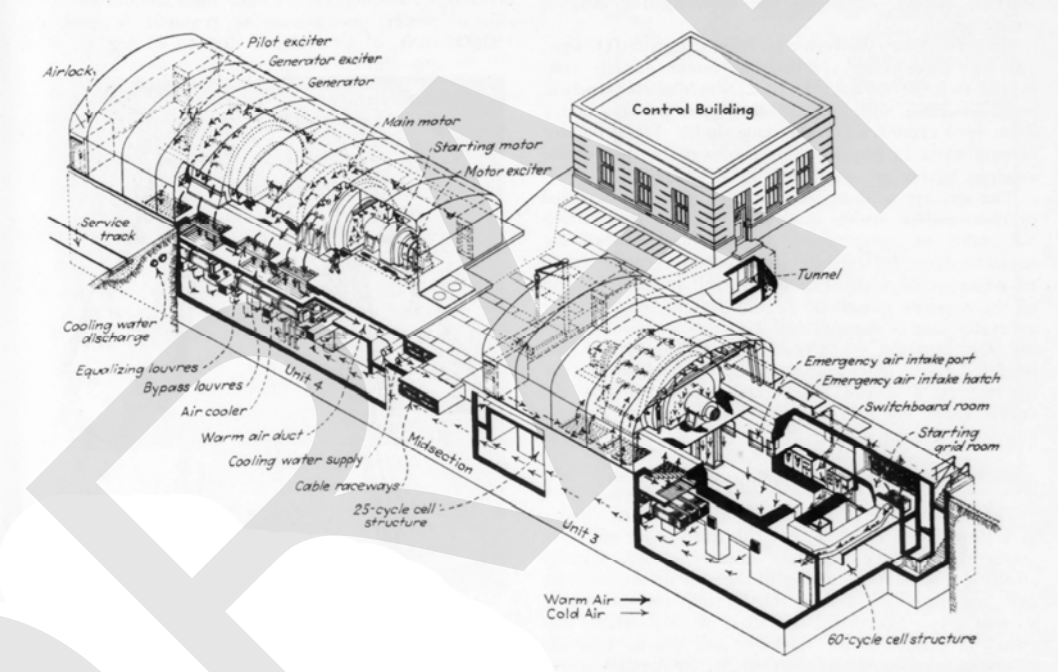

Figure H - This diagram of the Converter Substation was included in an August 20, 1932 article in Electrical World that discusses the various features of the installation.

Concurrent with the construction of the Converter Substation, Philadelphia Electric began to install a third turbogenerator in Turbine Hall to keep up with the demand from the PRR, including its upcoming electrification of freight lines. In July 1932, Philadelphia Electric awarded an $8.5 million contract to the Westinghouse Electric Company to build a new 165,000kw turbogenerator, which would be the largest single-shaft unit ever made. Built in Westinghouse's South Philadelphia plant, the project was so complex that it required the employment of 800 men and 349,000 man-hours over a period of three years to build and install.

[18] Westinghouse Electric & Manufacturing Company, "The Pennsylvania Railroad Electrification," (East Pittsburgh, PA, 1936).

Despite having significantly more power than the two existing turbogenerators, due to technological advancements the Westinghouse unit would require no more space than had been reserved for a third 60,000kw unit. The new unit measured 96 feet long, 28 feet wide, 26 feet high and weighed more than 1000 tons.[19] Like Richmond Station itself in 1926, the completion of the new turbogenerator in August 1935 brought national attention from both trade publications and newspapers. The Westinghouse unit, which required the construction of two new boilers with two large exhaust stacks at the northeast corner of the Boiler House (**Figure I**), remains in Turbine Hall today as the northernmost of the four turbogenerators. Possibly due to the increasing complexity of activities that occurred at Richmond Station beginning in 1932, a one-story office building – the Administration Building – was built at the northwest corner of the property, adjacent to the main gate, in 1936. The building housed the offices of the station superintendent, assistant superintendent, as well as other key staff members, spaces that were previously located in the station itself.

Figure I - This 1941 photo shows the two exhaust stacks that were added to the northeast corner of the Boiler House in 1932 with the installation of the new Westinghouse turbogenerator. The photo was taken by the Dallin Aerial Survey (Hagley).

No major changes were made to the station between the completion of the Administration Building in 1936 and the end of World War II. In April 1946, a nationwide coal miners' strike – a major crisis for industry and transportation across the United States – led to the near disappearance of coal. At one point, the *Philadelphia Inquirer* reported, Philadelphia Electric

[19] "Awarding of Large Electric Contract Gives Work to 800," *The Philadelphia Inquirer*, July 7, 1932; "Work is Supplied 800 For Two Years," *The Philadelphia Inquirer*, July 9, 1932;" "Philadelphia Ranks High as Electric User," *The Philadelphia Inquirer*, October 4, 1936.

had only 46,000 tons of coal left in its reserves on Petty's Island, enough to last less than 12 days at the normal rate of consumption.[20] Facing a virtually existential threat, Philadelphia Electric hastily installed oil conversion equipment at its central stations, including Richmond, so that the boilers could run on oil rather than coal. Although the company pleaded with both domestic and industrial customers to reduce their electricity usage, and in fact resorted to brownouts during a second round of strikes in November and December, Philadelphia Electric survived the shortage through its emergency measures and a stockpile of coal that had been built up during the summer on Petty's Island, which earlier in the year had virtually been swept bare. Despite the lingering threat of strikes, coal remained the company's principal fuel source for about another decade.[21] In 1952, the company actually expanded its coal storage capacity, closing the Petty's Island facility and opening a new coal storage yard in the open area just south of Richmond Station, including on a second parcel to the south that was separated from the main property by a City of Philadelphia sewage treatment plant (This parcel was sold by Philadelphia Electric in 1966, when it became part of the new Tioga Marine Terminal. Since the second parcel was only ever used for coal storage and its sale occurred within the period of significance, it is excluded from the National Register boundary). At Richmond, the company would be able to store 1,000,000 tons of coal or four times the capacity of Petty's Island (**Figure J**).[22]

Figure J - In this 1955 Kodak advertisement, which appeared in several national magazines, including Fortune and Newsweek, the use of the site south of the Power Station for coal storage is depicted. The outdoor substation is seen at far left. The photo was taken by the Aero Service Corporation of Philadelphia.

[20] "P.U.C. Rule Eases Transport Crisis," *The Philadelphia Inquirer*, May 8, 1946.
[21] Wainwright, 318; Electrical World, Vol. 127.
[22] "Philadelphia Electric Expands Coal Facilities," *The Philadelphia Inquirer*, May 26, 1952.

Southwark, Cromby and Eddystone: Philadelphia Electric, 1948-1960
In 1948, Richmond Station was joined by Philadelphia Electric's newest steam plant: the Southwark Station on the Delaware River in South Philadelphia[23]. With four turbogenerators and a rating of 377,000kw, it was significant in size but still smaller than Richmond Station. In fact, Richmond remained a critical link and continued to expand even as newer facilities like Southwark were being built (Southwark was followed by Cromby Station on the Schuylkill River near Phoenixville, Pennsylvania, in 1954). In 1950, for example, a fourth and final steam powered turbogenerator was added to the station, this time to power the postwar development of Northeast Philadelphia that brought thousands of new homes to this region of the city. Ordered in 1949 and costing roughly $20 million, the new 182,000kw unit from General Electric overtook the previous Westinghouse unit as the world's largest single-shaft turbine. The new turbogenerator increased Richmond Station's rating to 467,000kw, making it the largest steam plant in the Philadelphia Electric system (only Conowingo, a hydroelectric plant with a rating of 512,000kw, was larger). The General Electric unit required the construction of a final boiler at the southeast corner of the Boiler House, as well as a single cylindrical stack located just south of the original rooftop water tower. New coal processing equipment for this boiler was housed in a large, metal penthouse structure built just east of the stack at the same time. The unit remains in Turbine Hall today as the southernmost of the four turbogenerators.[24] Richmond Station was joined by Philadelphia Electric's final steam plant – Eddystone Station[25] on the Delaware River just north of Chester, Pennsylvania – in 1960. Although larger and more efficient than Richmond Station, Richmond still served an important role in providing power to the northeastern service area and was still the largest power station within the city of Philadelphia.

Peach Bottom and Limerick Nuclear Power Plants: Philadelphia Electric, 1967-1984
By the mid-1960s, however, Philadelphia Electric began to explore nuclear energy for the first time, resulting in the opening of the Peach Bottom Nuclear Power Plant on the Susquehanna River in Lancaster County, Pennsylvania, in 1967. Although it started in a small way with a rating of only 40,000kw, Peach Bottom was significantly expanded during the early 1970s as Philadelphia Electric increasingly relied on cheaper, more efficient, and more environmentally friendly nuclear power. Peach Bottom was followed by the even larger Limerick Nuclear Power Plant on the Schuylkill River in Limerick Township, Pennsylvania, planning for which began in 1969. Construction on Limerick began in 1974 and the station was operational by 1984.

Following the opening of the Limerick nuclear plant in 1984, Richmond Station was finally taken offline, leaving only the outdoor substation in operation. The only notable change to the property after 1967 was the addition of nineteen internal combustion turbines on the site south of

[23] The Southwark Station of the Philadelphia Electric Company located at 2501 S Delaware Avenue in Philadelphia, built in 1941 and designed by architect Paul Phillippe Cret, is currently unevaluated individually but is within the boundaries of the National Register eligible Moyamensing Piers of the Port of Philadelphia Historic District (Resource# 2014RE00500).
[24] Wainwright, 313; Philadelphia Electric Advertisement in *The Delaware County Daily Times*, May 7, 1951.
[25] The Eddystone Station of the Philadelphia Electric Company located at 1 Industrial Highway in Eddystone, Delaware County and built beginning in 1957 (Resource# 2013RE00781) has been determined individually eligible for listing in the National Register of Historic Places due to the significance of its coal "pressure-temperature (P-T) supercritical generator".

the power station. Although the station was still capable of handling normal consumption, during peak times it was increasingly strained. To make up the difference, Philadelphia Electric installed eight Worthington combustion turbines just west of the bulkhead at the southeast corner of the site around 1968. Combustion turbines, which operated much like jet engines, were ideal for "peaking," as it was termed, for they could be fired up immediately to quickly respond to increased loads. The turbines were fueled by oil that was stored in the large cylindrical tanks that were installed just south of the power station (one of these tanks still exists). The Worthington units were joined by another eight units from Westinghouse in 1971 and another three from General Electric in 1973-74. Only the General Electric units remain today, with the others having been removed during the 1990s.

Since 1984, Richmond Station has been essentially abandoned and has attracted significant attention as an urban exploration site. It has also been used as a location for several major motion pictures, including the post-apocalyptic horror film *12 Monkeys* (1995) and *Transformers: Revenge of the Fallen* (2009).

The Function of Richmond Station

Richmond Station reflected an electrical generation process that became typical of large central power stations beginning around 1910. The power stations built in American cities between the 1870s and early 1900s were relatively small and had to be located in downtown areas; because they typically used direct current, their transmission range was very limited. With consolidation and the need to create more uniform electrical grids, however, plants began using alternating current, which had a much greater transmission range. Alternating current allowed larger central plants to be constructed away from the crowded urban core.[26] The Chester, Delaware and Richmond stations were of the latter type, which began appearing in American cities shortly before World War I. Like its counterparts in Chester and downriver in Fishtown, the primary components of Richmond Station – Boiler House, Turbine Hall, and Switch House – were physically separated into discrete spaces to reduce the risk of fires, explosions, and electrocution (**Figure K**). The process by which these spaces interacted to generate electricity is described below.

[26] Sneddon and Wunsch, HAER, 26-27.

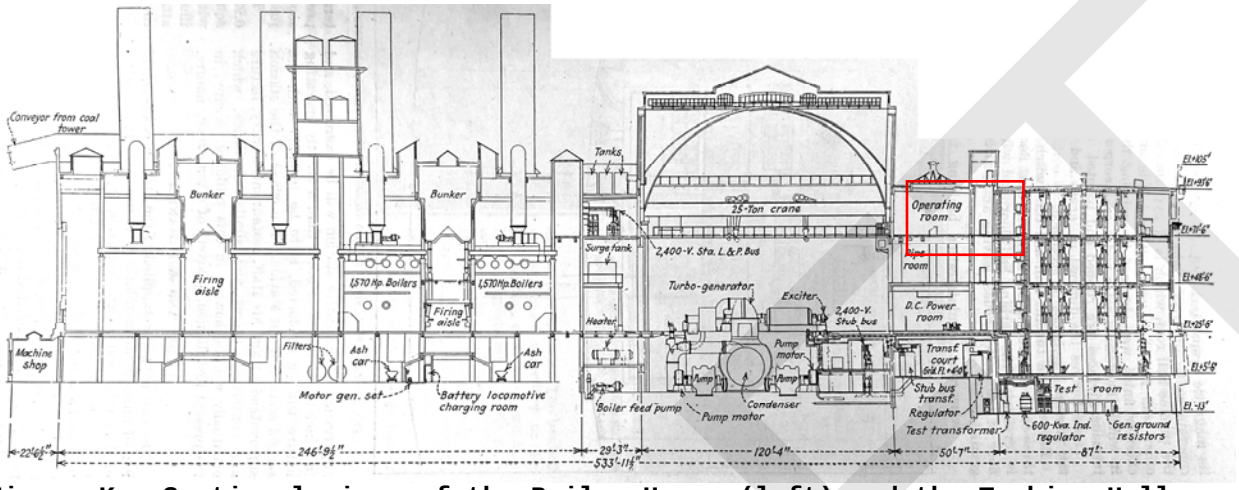

Figure K - Sectional views of the Boiler House (left) and the Turbine Hall and Switch House (right), from (1927). The Operating Room, which was located on the fourth floor of the Switch House and was the main control center for Richmond Station, is circled in red.

Coal, Richmond Station's principal fuel source, was delivered to the pier on barges from Petty's Island in the Delaware River, where Philadelphia Electric's primary coal yard was located. The coal would then be lifted by boom hoists at the top of the Coal Tower, where it would be broken down and crushed to the appropriate size in preparation for firing. After processing, the coal – up to 1,200 tons per day – would be transported on the conveyor to the top of the Boiler House where it would be distributed to concrete bunkers above each of the boilers. From the bunkers, the coal would be fed by gravity into electric stokers before passing into the furnace to be burned. Air would be supplied by draft fans into the furnaces during the firing process to ensure proper combustion, and any resulting vapors would be released through the cylindrical metal stacks rising above the Boiler House roof. The huge amount of ash created during the coal firing process would be dropped into ash cars on the ground floor, directly under the boilers, which would then be pulled out of the building by electric locomotives. The ash would be stored in pits prior to removal from the site by barge or by rail. The coal and ash handling system is illustrated in **Figure L**.

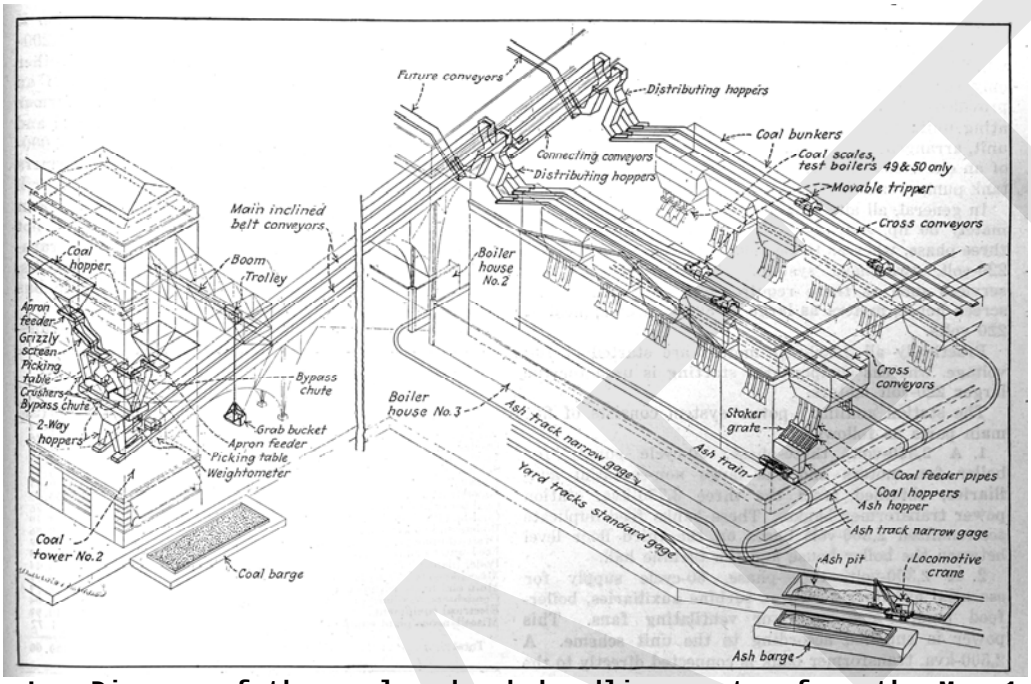

Figure L - Diagram of the coal and ash handling system from the May 1, 1926 issue of Electrical World. The Coal Tower is depicted at far left.

The heat generated by the burning coal would convert feed water in the boilers into steam, which would be piped under enormous pressure into the two turbogenerators in Turbine Hall. The steam turned the turbine blades at high speed, rotating a shaft in the generator to produce electricity. The steam was then exhausted into a condenser below the turbogenerator, where it would be cooled by circulating water into condensate, which would then be returned back to the boilers as feed water. Vast amounts of circulating water – up to 78,000 gallons per minute for each boiler – were required. The circulating water was pumped into the building from the river through intake tunnels, first passing through a series of screens in the Screenhouse in order to filter out all debris and sediment. Once the water had served its purpose of cooling the condensate, it was discharged back into the river. The circulating water intake and discharge arrangement is illustrated in **Figure M**.

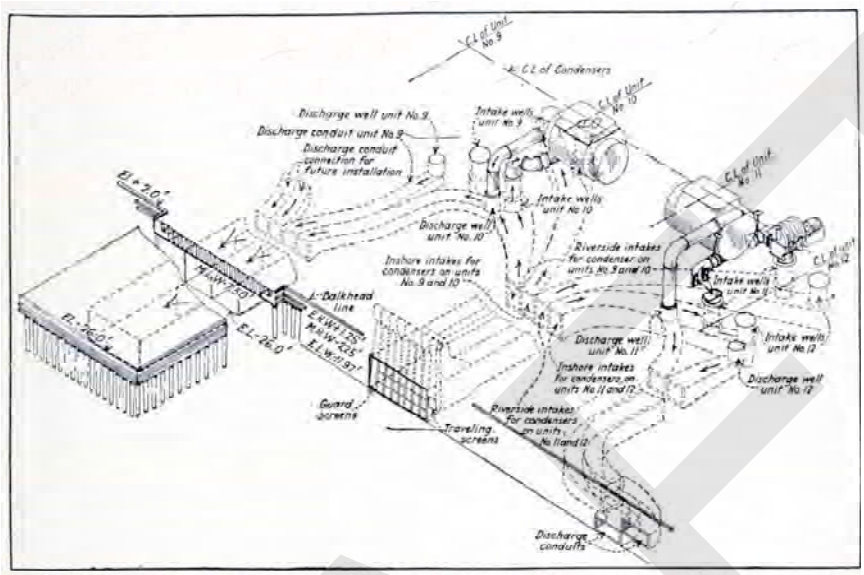

Figure M - Diagram of the circulating water system from Electric Power Stations by L.W.W. Morrow (1927).

The electricity created in turbine hall would be carried in underground cables to the Switch House, where it would pass through compartments with special reactors to protect against short circuits as well as transformers to raise or lower the voltage before being supplied to the Philadelphia Electric's various substations. This entire process, which was virtually automatic, was controlled and monitored by engineers in the Operating Room, located on the top floor between Turbine Hall and the Switch House, circled in **Figure K**, above.

The Architecture of Richmond Station

Richmond Station was designed by John T. Windrim (1866-1934), arguably Philadelphia's preeminent civic architect of the late-nineteenth and early-twentieth century. Apart from numerous city commissions for court houses, museums, and other civic buildings, Windrim and his firm designed many large office buildings, banks, hospitals, theaters and private residences for Philadelphia's most prominent companies, institutions, and citizens. Some of the firm's most notable Philadelphia work includes the Commonwealth Title & Trust Company Building, a fifteen-story Beaux-Arts style bank and office tower at 1201 Chestnut Street (1901); the Franklin Institute Science Museum, a Classical Revival limestone edifice on Logan Square (1931); and the Lincoln-Liberty Building, an Art Deco office tower at 1 South Broad Street (1932). "Due to the visibility of his projects," architectural historian Sandra L. Tatman writes, "Windrim became the best-known Philadelphia practitioner of the classical revival style often designated as Beaux Arts."[27]

One of Windrim's first commissions from Philadelphia Electric came in 1902 when his firm was hired to design the Schuylkill A-1 station[28]. The firm remained the company's primary architects over the next three decades. In recognition of his central role in shaping the Philadelphia Electric system, Windrim was elected to the company's board of directors in 1911. After Schuylkill A-1, Windrim and his firm would design over thirty Philadelphia Electric buildings, including the company's headquarters at 9th and Sansom Streets in Center City[29]; the Chester, Delaware and Richmond Stations; and dozens of substations and district offices throughout the city and suburbs, many of which remain in service today. The Chester[30] and Delaware[31] Stations were individually listed on the National Register in 2007 and 2016, respectively.[32] In the firm's role as chief designers for the Philadelphia Electric system, they played a central role in the standardization of the utility during the early twentieth century; in many ways, due to their ubiquity throughout the city, their buildings became the public face of the standardization effort and helped to shape Philadelphia Electric's image.[33]

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[27] Sandra L. Tatman and Roger W. Moss, *Biographical Dictionary of Philadelphia Architects: 1700-1930* (Boston: G.K. Hall, 1985), accessed at www.philadelphiabuildings.org/pab/app/ar_display.cfm/21563 on 9/8/15.

[28] The Schuylkill Station of the Philadelphia Electric Company, built 1902 with additions in 1924, (Resource# 1995RE14152) and located at 2600 Christian Street in Philadelphia, situated between Grays Ferry Avenue, Christian Street, Peltz Street and the Schuylkill River, is currently unevaluated for listing on the National Register of Historic Places.

[29] The 23 story tall, Art Deco style tower that Windrim designed as the second PECo Headquarters building, built in 1923 and located at 130 South 9th Street (Resource# 2019RE05580) is a contributing resource to the National Register listed East Center City Commercial Historic District (Resource# 1984RE00227).

[30] The Chester Waterside Station of the Philadelphia Electric Company, built 1916, is located at 2501 Seaport Drive in Chester (Resource# 2001RE01971) was individually listed in the National Register of Historic Places in 2007 under Criteria C in the area of Architecture.

[31] The Delaware Station of the Philadelphia Electric Company, built 1917-1923, is located at 1325 Beach Street in Philadelphia (Resource# 2015RE01646) was individually listed in the National Register of Historic Places in 2016 under Criteria A in the Area of Engineering and Criteria C in the area of Architecture.

[32] Suzanna Barucco, "Chester Waterside Station," National Register Nomination, 2007; Kevin McMahon, "The Delaware Station of the Philadelphia Electric Company," National Register Nomination, 2016.

[33] The role of architecture in shaping public perceptions of Philadelphia Electric is discussed at length by architectural historian Aaron Wunsch in *Palazzos of Power: Central Stations of the Philadelphia Electric Company, 1900-1930* (New York, Princeton Architectural Press, 2016).

Like most of Windrim's work for Philadelphia Electric, Richmond Station reflected the influence of the Beaux Arts style, an architectural language popularized in the United States by the World's Columbian Exposition in Chicago in 1893 and the City Beautiful Movement that followed. After decades of eclectic, revivalist design, Americans around the turn-of-the-century began to display their new economic confidence with civic, commercial and institutional buildings firmly rooted in the architectural traditions of Ancient Rome. By applying this highly formal, Classical language to the vast scale of the power station, visible for miles up and down the riverfront, Windrim's intent at Richmond Station was to create an ennobling monument to electricity. Through its impressive size and formal treatment, the building became a symbol of the essential role that electricity had come to play in the daily lives of Philadelphians, a role that demanded an edifice as grand and noble as any civic or governmental building.

More importantly, Windrim's goal in designing Richmond Station was to help shape the Philadelphia Electric Company's public image through architecture, enhancing its corporate identity at a time when the company was coming under increasing scrutiny as a monopoly. The company's chief antagonist during this period, Morris Llewellyn Cooke, Philadelphia's Director of Public Works during the late 1910s and later a close advisor to Pennsylvania Governor Gifford Pinchot, repeatedly accused Philadelphia Electric of inefficient management, overvaluing its assets, and overcharging customers, among other allegations. Cooke's efforts resulted in Philadelphia Electric cutting its rates in 1916, but negative perceptions lingered for years, particularly as Cooke and Pinchot attempted (ultimately unsuccessfully) to bring the company under the umbrella of a publicly controlled "Giant Power" system during Pinchot's first term in 1922-1926. Only through the economies of scale of a vast, statewide super-power system, Cooke argued, could efficient management and consistent, affordable rates be achieved. During this time, Philadelphia Electric attempted to demonstrate with architecture – through a standardized visual vocabulary that would be recognizable on a regional scale – that it was in effect a super-power system in itself.[34]

Although the public most often encountered the Philadelphia Electric Company through its many neighborhood substations and district offices – nearly all designed by Windrim's firm in a consistent Classical and, later, Art Deco style – central stations became the centerpieces of the company's efforts to persuade the public. Richmond Station, in particular, held an exalted position due to its location directly adjacent to the Delair Railroad Bridge, across which all passenger trains going to or arriving from Atlantic City had to cross. To the thousands of people traversing the bridge daily, Richmond Station became an dramatic visual landmark and reminder of the vast citywide and regional system that powered their homes and places of work. Due to extensive illumination, the station was even visible at night, presenting "a lordly and dignified mien" (**Figures N and O**).[35] Through the immensity and formal treatment of Richmond Station, Philadelphia Electric projected stability and permanence and created the impression that

[34] Wunsch, 51-53. For more on Giant Power, see Jean Christie, "Giant Power: A Progressive Proposal of the Nineteen-Twenties, in *The Pennsylvania Magazine of History and Biography*, Vol. 96, No. 4 (Oct., 1972), 480-507.
[35] Philadelphia Electric Company, "Richmond Station" (1926), 3.

Philadelphia Electric's mission, with the public interest in mind, was a noble one.[36]

Figure N - Nighttime view, looking from the pier to the Boiler House ("Richmond Station," 1926).

Figure O - Nighttime view, looking toward the north elevation in 1926 (PECO Archives).

[36] Sneddon and Wunsch, HAER, 32.

Compared to Windrim's work on the similarly monumental Chester Station, the application of the Beaux Arts style at Richmond Station was fairly restrained, although less austere than at Delaware Station. The Chester Station is richly articulated with tall pilasters and columns with other Roman motifs found throughout the building. In addition, its more varied palate of materials – limestone features set against a light brown brick wall surface – are more in keeping with the ornate tendencies of the Beaux Arts. While a Classical vocabulary is clearly present at Richmond Station – its symmetry and tripartite arrangement of rusticated base, shaft, and entablature are hallmarks of the Beaux Arts – its elevations are relatively planar and, beyond the denticulated cornice, lack obvious ornament. Rather, Richmond Station impresses with its sheer form and massing. That economic and functional considerations took precedent over design suggests that, in a post-war climate of exponential growth in electricity demand, the station had to be built as quickly and efficiently as possible.

The Philadelphia Electric Power Stations Today

All of Philadelphia Electric's major coal-powered steam plants remain standing. Remarkably, the Schuylkill Station is still in operation as a cogeneration plant, providing both steam and electricity to customers in the Center City area of Philadelphia. Although Schuylkill was sold to the Trigen-Philadelphia Energy Corporation in 1987, PECO Energy Company (Philadelphia Electric's successor, which is now owned by Exelon), continues to buy back Trigen's electricity as part of a long-term contractual agreement. The Chester Station, which was individually listed on the National Register in 2007, was rehabilitated using the Federal Historic Tax Credit and serves as a model for how large power stations can be adaptively reused as office space. Delaware Station, which was taken offline in 1969 (a later, 1950s addition continued to operate until 2008) was individually listed on the National Register in 2016 and is currently undergoing a rehabilitation using the Federal Historic Tax Credit that will convert the building into offices and apartments. The Southwark and Eddystone Plants are still owned by Exelon and continue to operate, however the Philadelphia area has for decades been powered largely by Peach Bottom and Limerick, Philadelphia Electric's nuclear plants.

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form.)

Barucco, Suzanna. "Chester Waterside Station." National Register Nomination (2007).

Christie, Jean. "Giant Power: A Progressive Proposal of the Nineteen-Twenties." *The Pennsylvania Magazine of History and Biography*, Vol. 96, No. 4 (Oct., 1972), 480-507.

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Eglin, William C.L. "System Aspects of Richmond Station." *Electrical World*, vol. 87, no. 18 (May 1, 1926).

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Hopping, E.L. "Mechanical Design of Richmond." *Electrical World*, vol. 87, no. 18 (May 1, 1926).

McMahon, Kevin. "The Delaware Station of the Philadelphia Electric Company." National Register Nomination (2016).

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"Richmond Goes on the Line with 100,000 Kilowatts," *Power Plant Engineering*, vol. 30 (May 15, 1926).

Spina, Laura M. "Richmond Power Station." Nomination to the Philadelphia Register of Historic Places (2001).

Wainwright, Nicholas B. *History of the Philadelphia Electric Company*. Philadelphia: Philadelphia Electric Company 1961.

Westinghouse Electric & Manufacturing Company. "The Pennsylvania Railroad Electrification." (East Pittsburgh, PA, 1936).

Wunsch, Aaron V. *Palazzos of Power: Central Stations of the Philadelphia Electric Company, 1900-1930*. New York, Princeton Architectural Press, 2016.

Previous documentation on file (NPS):

__X_ preliminary determination of individual listing (36 CFR 67) has been requested
____ previously listed in the National Register
____previously determined eligible by the National Register
____designated a National Historic Landmark
____ recorded by Historic American Buildings Survey #_____
____recorded by Historic American Engineering Record # _____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

____ State Historic Preservation Office
____ Other State agency
____ Federal agency
____ Local government
____ University
____ Other
Name of repository: PECO Archives

Historic Resources Survey Number (if assigned): 120345

10. Geographical Data

Acreage of Property 31 acres

Use either the UTM system or latitude/longitude coordinates

Latitude/Longitude Coordinates
Datum if other than WGS84:_____
(enter coordinates to 6 decimal places)

A. Latitude: 39.986667 Longitude: -75.075187

B. Latitude: 39.984057 Longitude: -75.071716

C. Latitude: 39.981374 Longitude: -75.076392

D. Latitude: 39.984712 Longitude: -75.079186

Verbal Boundary Description (Describe the boundaries of the property.)
The boundary of the property is shown as a dotted line on the accompanying map entitled "Richmond Station: Site Plan with National Register Boundary"

Boundary Justification (Explain why the boundaries were selected.)
The proposed National Register Boundary (**Figure 15**) conforms to the historic parcel and includes all existing resources that were historically and functionally related to Richmond Station.

Form Prepared By

name/title: Kevin McMahon, Associate
organization: Powers & Company, Inc.
street & number: 1315 Walnut Street, Suite 1717
city or town: Philadelphia state: PA zip code: 19107
e-mail: kevin@powersco.net
telephone: (215) 636-0192
date: January 15, 2021

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Name of Property: Richmond Station

City or Vicinity: Philadelphia

County: Philadelphia State: PA

Photographer: Robert Powers and Kevin McMahon

Date Photographed: August 12, 2020

Description of Photograph(s) and number, include description of view indicating direction of camera:

Photograph #	*Description of Photograph*
1.	Boiler House, east elevation, looking northwest.
2.	Boiler House, east and north elevations, looking southwest.
3.	Boiler House, north elevation, looking south.
4.	Boiler House, south and east elevations, looking northwest.
5.	Turbine Hall, north elevation, looking southwest.
6.	Turbine Hall, south elevation, looking north.
7.	Switch House, west elevation, looking east.
8.	Switch House, north and west elevations, looking southeast.
9.	Switch House, south elevation, looking north.
10.	Switch House, main entrance on west elevation, looking east.
11.	Boiler House interior, typical boiler equipment.
12.	Boiler House interior, typical boiler equipment.
13.	Boiler House interior, typical firing aisle.
14.	Turbine Hall, looking east from the fourth floor control room.
15.	Turbine Hall, heater gallery, looking north.
16.	Turbine Hall, main floor, looking southeast.
17.	Turbine Hall, main floor, looking northeast.
18.	Turbine Hall, main floor, looking west.
19.	Control Room on fourth floor, looking south.
20.	Switch House, first floor vestibule, looking southeast.
21.	Switch House, second floor corridor, looking west.
22.	Switch House, second floor corridor, looking east to Turbine Hall.
23.	Switch House, second floor, looking north.
24.	Switch House, second floor, looking north.
25.	Pier 225, looking east.
26.	Coal Tower at the end of Pier 225, west elevation, looking southeast.
27.	Coal Conveyor, looking south.
28.	Screenhouse, north and west elevations, looking southeast.
29.	Control House, south and east elevations, looking northwest.
30.	Converter Unit #3, looking northwest.
31.	Converter Unit #4, looking northwest.
32.	Administration Building, east and north elevations, looking southwest.
33.	Garage, west and south elevations, looking southeast.
34.	Garage and Sewage Pumphouse, south and east elevations, looking northwest.
35.	Utility Building, west and south elevations, looking northeast.
36.	Utility Building, east elevation, looking west.
37.	Storage Shed, looking northwest from Pier 225.
38.	Storage Building, south and east elevations, looking northwest.
39.	Storage Building, north and west elevations, looking southeast.
40.	Site south of the Power Station.

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 100 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management. U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.

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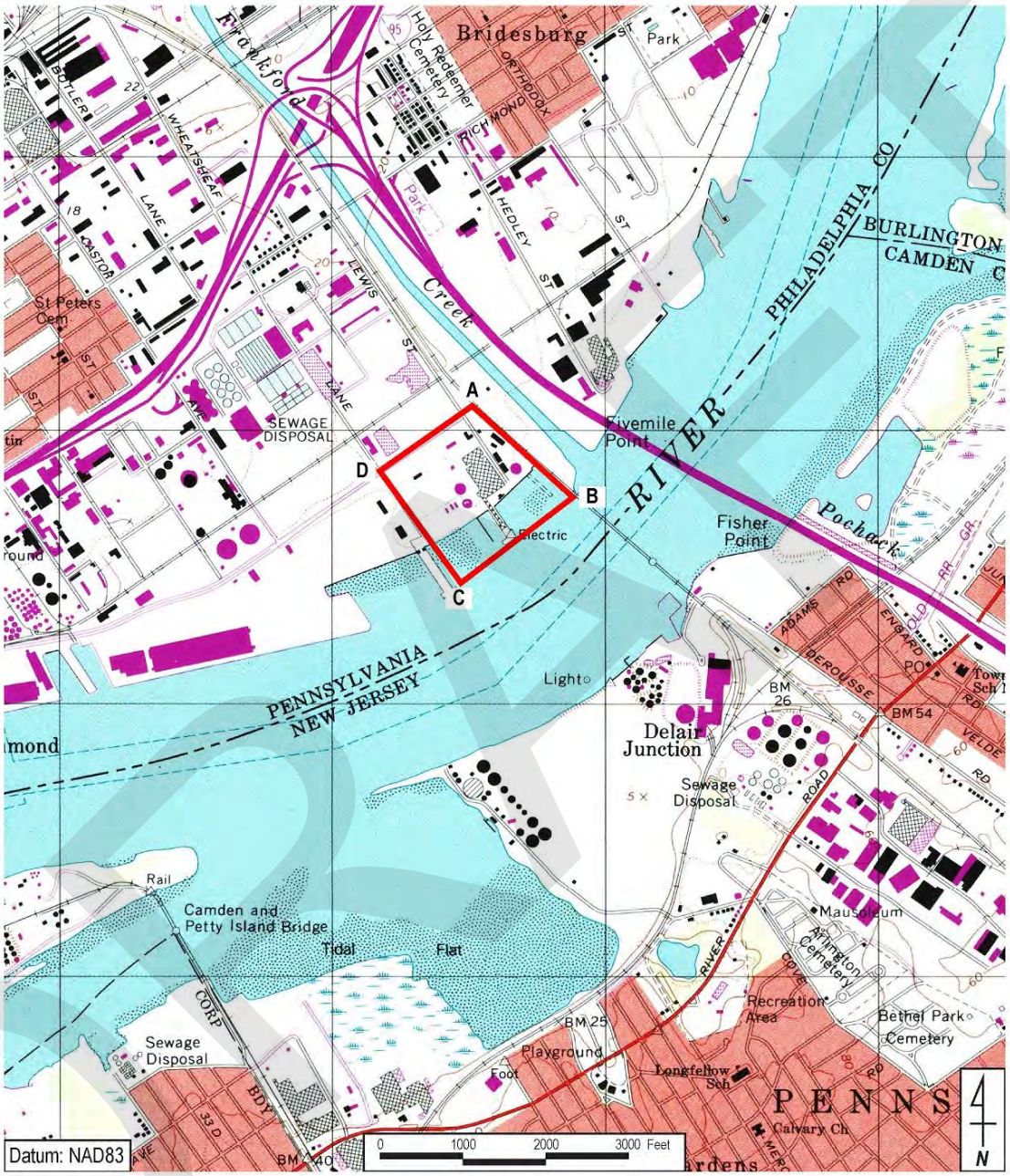

USGS Map - Camden Quadrangle - New Jersey-Pennsylvania (1995)

Richmond Station
4101 N. Delaware Ave
Philadelphia, Philadelphia County, PA

Latitude, Longitude
A 39.986667, -75.075187
B 39.984057, -75.071716
C 39.981374, -75.076392
D 39.984712, -75.079186

Figure P - USGS Map Excerpt

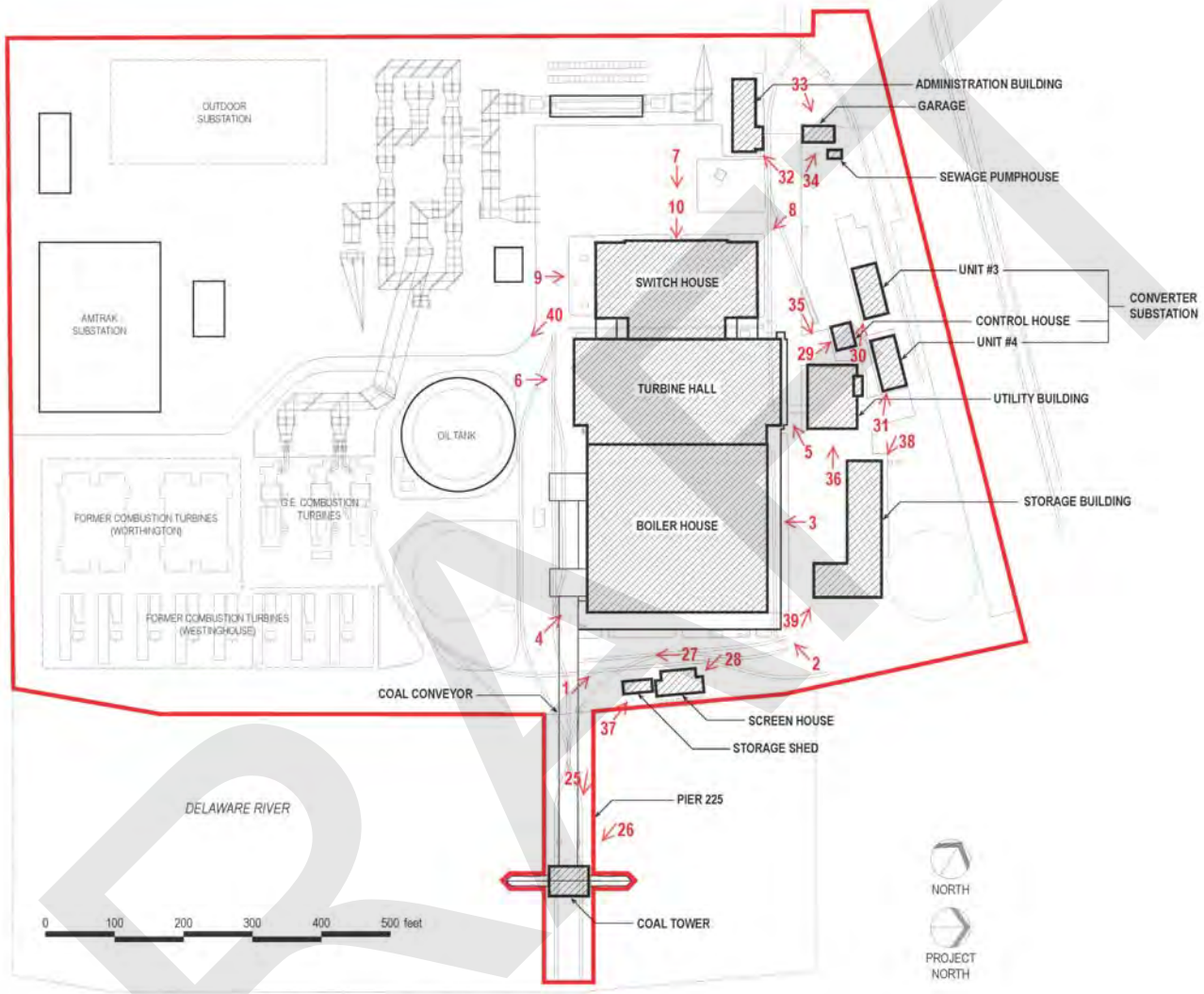

Figure Q - Site Plan with National Register Boundary and Photo Key

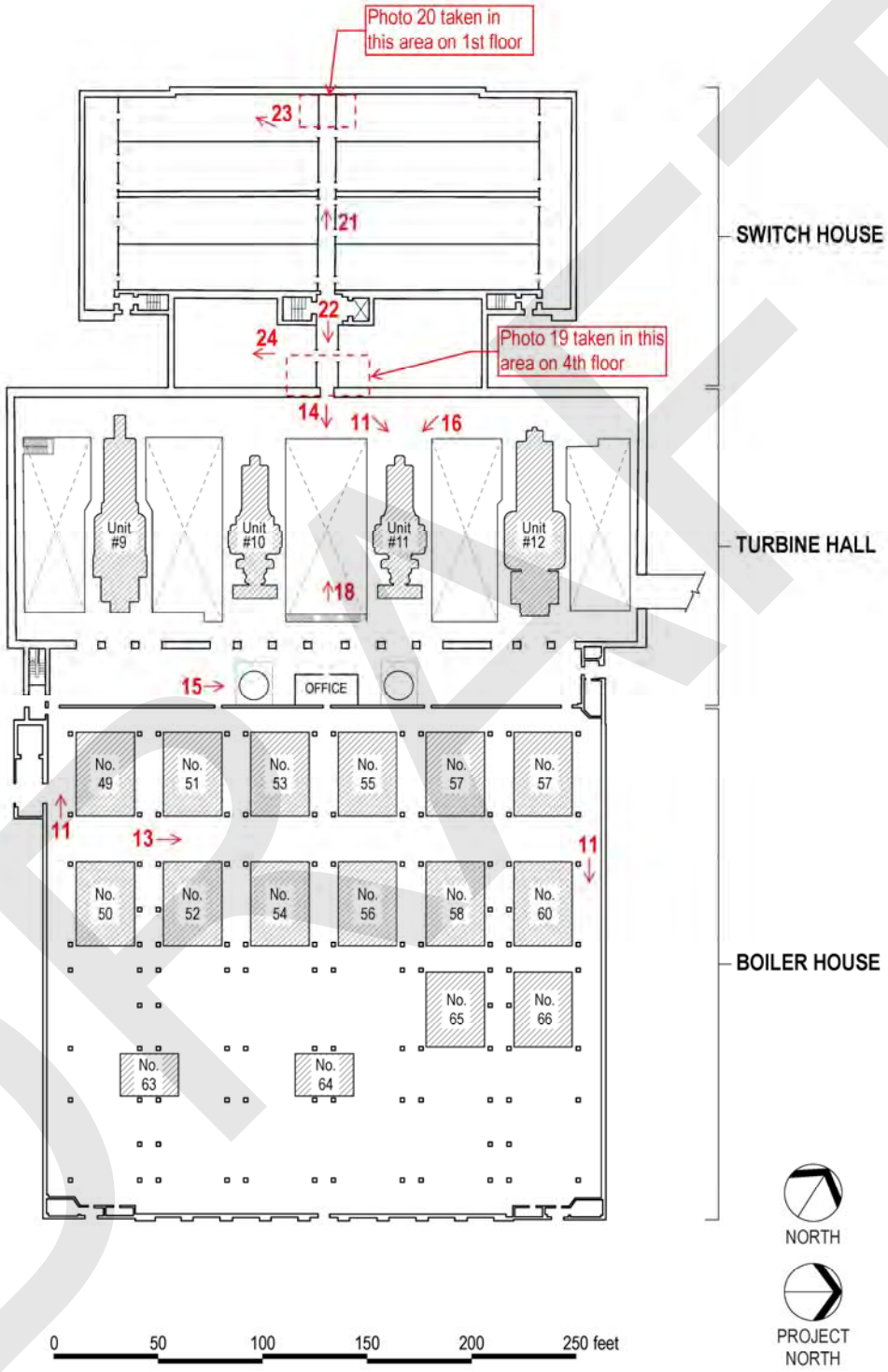

Figure R - Main Floor (2nd Floor) Plan with Photo Key