

RARITAN ARSENAL, WAREHOUSE M-4  
2890 Woodbridge Avenue  
Bonhamton Vicinity  
Middlesex County  
New Jersey

HABS No. NJ-1061-B

HABS  
NJ  
12-BONTO.V)  
1B-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN BUILDINGS SURVEY  
National Park Service  
Northeast Region  
U.S. Custom House  
200 Chestnut Street  
Philadelphia, PA 19106

HABS  
NJ  
12-BONTO-V,  
1B-

HISTORIC AMERICAN BUILDINGS SURVEY  
RARITAN ARSENAL, WAREHOUSE M-4 HABS No. NJ-1061-B

Location: 2890 Woodbridge Avenue  
Bonhamton Vicinity  
Middlesex County  
New Jersey

USGS Perth Amboy Quadrangle, Universal Transverse  
Mercator Coordinates: 18.554375.4484740

Present Owner: U. S. Environmental Protection Agency Region II  
26 Federal Plaza, New York, New York 10278

Present Use: Vacant

Statement of Significance: With the entrance of the United States into World War I in 1917, the War Department chose a site on the Raritan River in New Jersey as the U.S. Army's primary base for the storage and transshipment of munitions and other war materiel to Europe. The site comprised 2,150 acres, on which 275 buildings that came to constitute the Raritan Arsenal were erected during the period of October 1917 to November 1918. The masonry warehouse building originally designated M-4 was constructed in 1918, as part of the "Manufacturing Plant" group of buildings on the northern portion of the site. It was used to store and package truck and automobile bodies. During World War II the building was modified, but continued to be used by the Army for storing non-explosive materiel. The building is utilitarian in nature, one story high, approximately one hundred fourteen feet wide by five hundred eighty feet long. It was constructed with a perimeter of evenly spaced masonry piers and an interior grid of wooden piers, which permitted large openings in the walls. The shallowly pitched roof is pierced by steeply slanted skylights. This warehouse is significant as a typical non-munitions storage component of the Raritan Arsenal, which fulfilled an important function in supplying the U.S. Army in Europe in both World Wars I and II.

Part I. Historical Information

A. Physical History:

1. Date of erection: Authorized May 25, 1918. The concrete floor was authorized in a letter dated September 5, 1918. The building was substantially completed before November 1918.

2. Architect: Plans drawn by the Quartermaster General's Office in Washington, D.C., represented by Brigadier General I. W. Littell. Plans were modified for construction on the site by the Supervising Engineer of the Raritan River Ordnance Depot, G.A. Ferguson, (1917-January 1, 1919).

3. Original and subsequent owners: Built for the United States Army, and occupied by it until the Raritan Arsenal was decommissioned in 1964. At that time, the property was turned over to the General Services Administration (GSA). In 1977, GSA transferred the warehouse and other property of the former Raritan Arsenal to the United States Environmental Protection Agency. (See the maps of the property appearing later in this report).

4. Builder, contractor, suppliers: The general contractor for construction of the Raritan Arsenal's World War I buildings was Snare & Triest Company, of New York. Much of the masonry work, presumably including this warehouse building, was done by a team of Italian laborers. The construction crew numbered 4500 in the peak building month of April, 1918. In June, when the warehouse was probably begun, the construction crew on the site numbered 4000. The building originally cost \$175,352.00

5. Original plan and construction: Warehouse M-4 was planned as a large, 114-foot wide and 593-foot long single-story space without heat or plumbing on a concrete slab. When erected, its dimensions were fractionally smaller, 113.7 by 592.7 feet. The rectangular building's interior plan is composed of a grid of eight-inch square wooden piers 16 feet on center extending throughout the building. Tile fire walls divide the long building into seven bays. The shallow-pitched roof is pierced by skylights on either side of the slope of the roof. The structure of the building is carried along the exterior on a regularly spaced series of 32-inch-wide brick piers. The 15-foot wide openings were originally filled with paired wooden side-hinged doors. The doors are no longer extant but visible in historic photographs of the property. A 35-foot wide covered concrete platform extended along the east side of the building to serve as a loading platform for the railroad which ran beside it.

In the documentation of the original construction of Raritan Arsenal, three "storage buildings" are described. All were identical in size, "113.7 x 592.7 ft. with concrete floors, hollow

tile and brick walls, and with mill roof supported on posts. Light is provided by a saw tooth arrangement in the roof. Each has a concrete platform 35 ft. wide on the track side. A canopy covers the platform of the Body Storage Building." (Conrad, p. 53). This succinctly describes the original condition of Warehouse M-4.

6. Alterations and additions: Steam heating was introduced into the building in the autumn of 1918 and installation was about 75% complete when the work was halted because of the Armistice. The Army's own records indicate that very little money was spent on repairs to the building between 1919 and 1935. Some wallboard partitions were added in Bays 1, 3, and 4 during this time to create small offices and packing rooms. Electric lighting was introduced sometime before 1935, and upgraded in 1941. Steam heat was extended throughout the building in 1941.

In a 1919 photograph of the northeast section of the arsenal, the two structures which flank Warehouse M-4 are clearly visible, but M-4 itself is obscured. The flanking buildings, which were constructed at the same time for similar purposes, had exterior brick piers separated by large wooden doors; there was no "wall" but a series of operable doors acting as the screen between interior and exterior. The physical evidence at Warehouse M-4 suggests that this building was originally constructed in the same way.

A 1943 photograph of Warehouse M-4 shows that the wooden doors had been removed and the bays bricked in. Some bays held paired metal doors. This alteration was most probably made about 1942, as the Raritan Arsenal rapidly responded to the demands of World War II.

The newer brick is also found on the north and south gable ends of the building. The 1919 photograph shows a tiny corner of the north gable end of Warehouse M-4, which is clearly made of exposed hollow tile. It is unknown whether the tile was meant to be exposed, or if in the rush of construction, that finishing detail was left undone. There is no 1943 photograph of a gable end of Warehouse M-4, but the physical evidence suggests that the gable ends were covered with brick at the same time the side bays were bricked in.

No substantial alterations or additions have been made to the building since World War II. Doors on the east side facing the covered platform have been replaced with roll-down metal security doors. Neglect of the roof has caused serious deterioration of the structure since the 1970s.

B. Historical context: With the entrance of the United States into World War I in 1917, the War Department confronted the problem of shipping enormous quantities of munitions and supplies from Atlantic ports to the European front. A site along the Raritan River in New Jersey, accessible to New York harbor by water and by rail, was chosen as the Army's primary site for the storage of munitions and other war materiel. First named the Raritan River Ordnance Base, by 1919 the facility was known as the Raritan Arsenal, acknowledging the importance of munitions storage at the site. The magazines and bunkers for explosives occupied neat rows well south of this warehouse, far from populated areas. The northerly portion of Raritan Arsenal, near Woodbridge Avenue and the old village of Bonhamton, included offices, a machine shop, and warehouses for assembling and storing materials other than explosives. Warehouse M-4 was part of this group, known in World War-I era records as the "Manufacturing Plant."

Three "Truck Storage Facilities" were constructed in 1918 as part of the Manufacturing Plant, where trucks could be disassembled and stored for shipment overseas. This seems to have been the use for Warehouse M-4, and its twin across the railroad tracks to the east, Warehouse N-5, as well as a similar building west of these two, no longer standing. Warehouse M-4 was specifically for storage of vehicle bodies; other warehouses stored other parts. The truck storage facility was operated in conjunction with a driving school.

The Armistice of November 1918 brought an end to the nearly constant construction which had characterized the Raritan Arsenal during the war years. Storage and transshipment of Army supplies continued, and buildings were renovated or replaced as needed. Warehouse M-4 seems not to have received much attention during this time. It continued to be referenced as part of a group of truck storage buildings, so presumably it maintained its original use.

When war broke out in Europe in 1939, an expansion of the Raritan Arsenal was begun. New buildings were added, and the number of civilian employees began to climb. Warehouse M-4 was renamed Warehouse W-2 in 1941. Soon thereafter, the building was modified to close off most of the bays, and new metal doors were installed. The improvement of electric lighting in the building acknowledged the need for light by round-the-clock shifts at the warehouse. No explicit record of the use of the warehouse in World War II has been discovered. Clues remaining in the building include "No Smoking" signs painted on the walls, and signs which state "Floor Load Limit 1200 Lbs/Sq. Foot". Again, because of its location near the populous northern portion of the depot, the warehouse would certainly not have stored live ammunition, but it may have been used for the guns themselves.

A 1942 history of Raritan Arsenal listed some of the items stored at the facility. These included machine guns, automatic rifles, 37 mm guns and carriages, ammunition for these guns, machine gun carts, trench helmets, trucks and trailers, gun slings, pistol and revolver holsters, and bayonets and scabbards.

Due to its size and convenient location, the warehouse was maintained after World War II, even as other buildings on the property were demolished or fell into disrepair. Raritan Arsenal was active during the Korean War; the use of Warehouse M-4 during this time is unknown.

Raritan Arsenal was decommissioned by the Army in 1964, and the property turned over to the General Services Administration. Warehouse M-4 (now designated Building 203) has received little or no use or maintenance since that time, and has fallen into serious decay. The Raritan Arsenal property has been subdivided, with major sections going to a private owner for commercial development and to Middlesex County for creation of a County College. The portion of the Arsenal that includes Warehouse M-4 is owned by the Environmental Protection Agency. The building has not been utilized since 1977.

## PART II. ARCHITECTURAL INFORMATION

A. General Statement: The warehouse building originally known as M-4 on the Raritan Arsenal property is a large utilitarian building constructed on a grid system. Its design, materials, and workmanship are very simple, within the tradition of industrial building practice in the early 20th century.

1. Architectural character: The warehouse is a single-story rectangular building, with regularly spaced brick piers on the exterior and wooden piers on the interior in a grid of sixteen feet on center. Interior fire walls of hollow tile divide the building into bays. (See attached floorplan). The regular grid gives the building its form, and dictates the spacing of openings within the bays. It is a building whose form is a direct expression of function, not style.

2. Condition of fabric: The warehouse is currently in very poor condition. The skylights leak, and water damage has caused the buckling or collapse of several sections of the building. Doors are in most cases inoperable, having rusted to their hinges in either an open or shut position.

### B. Description of Exterior:

1. Over-all dimensions: 113.7 feet x 592.7 feet (according to Army records). The 1964 GSA inventory lists it as approximately 120 feet x 580 feet. Measurements made for this study: 115 feet by 576 feet.

2. Foundations: poured-in-place concrete slab.

3. Walls: Red brick piers 32 inches wide, spaced 16 feet on center, form the basic wall structure on the east and west sides

of the building. The bricks are not first quality, being worn, pitted, and, in some cases, marked with a black crust, evidence of firing problems. The brick is laid in English bond (five rows of stretchers, one row of headers), although there are variations in the pattern from pier to pier. The brick is set in a light-colored, medium-grained mortar, with occasional yellow beach pebbles visible. Every fifth pier rises above the roof height to form a brick parapet above the internal fire wall running the width of the building. Between the piers, a much higher quality hard red brick, evenly laid in a true English bond, is set in a coarse mortar with many bright yellow-orange beach pebbles in the mix. This brick was part of the ca. 1942 alterations to the building, filling in the bays, which had previously only held large, paired wooden doors. The brick was used to block down the openings to accommodate smaller doors. The same hard brick is used as a facing on the north and south gable ends of the building.

4. Structural system, framing: The building is constructed on a post-and-beam system of wood and masonry. The structure consists of brick piers (32 inches wide) around the perimeter and wooden piers (eight inches each side) spaced sixteen feet on center throughout the interior of the building. The internal piers are set in metal collars anchored into the concrete slab floor. Metal connectors anchor the 4-inch wide by 12-inch deep wooden beams of the roof system to the piers. On the exterior, a coarse-aggregate concrete lintel spans the space between the brick piers.

5. Porches, stoops, balconies, bulkheads: A concrete platform 35 feet wide extends along the east side of the building. It provided for on-grade transfer of goods from the warehouse into railroad cars, which stood on the siding east of the building. The platform is covered with a roof, which extends from the building on steel "I" beams and wooden frames. Thin metal pipes located 16 feet from the building help support the broad extension of the roof. The flat roof is made of wooden planks, covered with tar and gravel. A ramp along the northern end of the building allows for a change of grade between the street to the north of the warehouse and the platform.

6. Chimneys: There are no chimneys on the building. Heating was accomplished with a steam system, which operated from a central heating plant located north of the warehouse, in a building now demolished.

7. Openings:

a. Doorways and doors: There are six sets of large metal doors on the west elevation of the building. These doors are side-hinged, hung in pairs. They are 11 feet, 10 inches tall, and each door is five feet wide. The doors are rusted; on some the

stencilled numbers indicating the bay are visible. In the seven bays on the east side of the building the openings are closed by metal roll-up doors that appear to post-date the World War II alterations to the building. Odd numbered bays begin with 1 on the southernmost end, and proceed north along the east side of the building; even-numbered bays are on the west

b. Windows: The north and south gable ends of the building consist of three evenly spaced bays that contain large metal-frame industrial windows. The individual panes are twelve inches wide and eighteen inches high. Each window is six panes across and six panes high; two windows in each bay are paired to give an opening twelve feet wide and nine feet high. The windows have a lower frame of fine-grained cast concrete. It is topped by another concrete sill of very coarse, dark aggregate, that matches the flat lintel above. This may indicate replacement of the window, and insertion of another sill to fill the space. There is no framing other than the brick wall on the sides of the windows. On the south side of the building, a smaller, six-panel metal window, which tilts out to open, is located high in the wall between the center and westerly bays. It lights the rest room inside. There are no windows in the east or west elevations of the warehouse except two wooden six-over-six sash windows on the west wall of the most southerly bay.

#### 8. Roof:

a. Shape, covering: The roof of the warehouse is a shallow-pitch gable. The wooden plank roof deck is covered with tar and gravel roofing.

b. Cornice, eaves: The building's brick wall, where it meets the roof, is topped with a corrugated copper gutter. The roof does not extend past the walls. Water runoff is carried in these internal gutters to a metal downspout attached to the side of the building at most of the brick piers which mark bay divisions on the west side.

c. Dormers, cupolas, skylights: The warehouse has two rows of seven skylights, two in each bay. The skylights are set on each side of the roof ridge, in a copper frame. Each triangular-shaped skylight is 48 feet long and has a vertical "window" of metal-mesh reinforced corrugated glass facing east. Each skylight has a steep, tar-and-gravel covered shed roof on the west side. At the north and south ends of each skylight are the remains of metal ventilators, one of which survives intact at the south end of the building.

#### C. Description of Interior

1. Floor plans: The single-story building is arranged on a grid system. The building has six wooden piers, each sixteen feet

apart and sixteen feet from the side walls, across its width (east-west axis). Four wooden piers, each sixteen feet apart, occupy the length (north-south axis) of all seven bays; the end piers of each bay are sixteen feet from an internal fire wall. Thus, one 80-foot section forms one bay, with a door centered in each of the exterior walls of the bay. The fire walls originally had three evenly-spaced openings; variations in this pattern on some spaces are due to later alterations. The building is thus composed of a series of large rooms, lighted on two sides and from the skylight above, with direct exterior access as well as access from identical rooms through internal fire doors.

2. Stairways: There are no stairways. The entire warehouse is on a single floor, and entry is made directly at ground level to facilitate movement of goods in and out of the warehouse.

3. Flooring: The floor of the warehouse is concrete.

4. Wall and ceiling finish: Brick walls are exposed on the interior of the warehouse. Interior fire walls are made of hollow tile. The brick piers and fire walls bear traces of white paint. The wooden piers inside the building are also painted white. The lower third of some are painted red, bright yellow, or yellow and black striped, to increase their visibility. The wooden roof truss and ceiling planks are also painted white.

5. Openings:

a. Doorways and doors: Internal fire doors are steel, hung on tracks, that are installed above the openings in the hollow tile walls. The heavy doors are held open by a counterbalanced weight system.

6. Decorative features and trim: The building is entirely utilitarian and has no decorative features.

7. Hardware: There is no hardware of note inside the building.

8. Mechanical equipment:

a. Heating: Metal pipes, part of a multi-building steam heating system, are still extant in the building.

b. Lighting: Electric lights in metal shades are hung from the roof, centered in each of the squares formed by the building's grid pattern. Wooden utility poles stand to the south of the building, and the pipe-like conduit which brought the electricity into the building from the exterior wires is visible.

On the exterior, "safety lights" in a copper-finish "cage" are positioned over each door.

c. Plumbing: The warehouse has a ceiling-hung sprinkler system. Plumbing for rest rooms was also introduced in the south section of the building.

Hydrants are placed at several locations around the perimeter of the building.

#### D. Site

1. General setting and orientation: The warehouse was built as one of a trio of identically sized and sited warehouses. (One is no longer standing; the other was known as Warehouse N-5). Warehouse M-4 is the more westerly of the two extant warehouses. A railroad siding ran between the two warehouses and terminated at the northern end of the buildings. The buildings are parallel to each other; their long axes run north-northwest to south-southeast.

2. Historic landscape design: The warehouses were constructed as part of a major building campaign to create a modern, efficient munitions storage facility in World War I. Buildings throughout the complex were arranged in rows, with the main streets of the base running northeast to southwest. Railroad sidings were constructed beside the buildings to facilitate loading and unloading at the Arsenal. The main railroad lines run across the southern edge of the Arsenal property, headed east to the Raritan Bay and New York Harbor. There was no landscaping of the warehouse site originally, although the twenty-foot patch of ground directly north and south of the warehouse was later planted in grass and treated as a lawn between the warehouse and the internal roads which ran north and south of the building.

3. Outbuildings: While there are dozens of standing buildings of approximately the same age and history as warehouse M-4, none is an outbuilding to this one.

### III. SOURCES OF INFORMATION

A. Original architectural drawings were sought in the Cartographic and Architectural Branch of the National Archives (NNSC), Pickett Street, Alexandria, Virginia. Their holdings include standardized plans drawn by the Quartermaster General's Office for army forts and accessory buildings from the late 19th century through the mid-20th century. They do not have any plans for any of the World War I-era buildings at the Raritan Arsenal.

B. Photographic documentation for the buildings comes from two sources, both in the Suitland Reference Branch of the National Archives (NNRR), Suitland, Maryland. The first is found in Report on the Construction of Raritan Arsenal, Metuchen, New Jersey, by Major C.K. Conrad. His report, done in 1919, documents the

construction of the arsenal with a lengthy description and some photographs. A photograph titled "Raritan Assembly Plant" is a view to the south from the old gateway into the facility near Woodbridge Avenue. In the background stands a row of warehouses, including the subject of this report. This document of the original appearance of the building is reproduced as Plate 4 in the 1990 Stage I Cultural Resources Survey of the E.P.A. Edison facility, but the details that are clear in the original photograph are impossible to make out in reproduction.

The second photograph is in a bound volume of Raritan Arsenal Photographs, from Records of the Office of the Chief of Ordnance, from 1940-1945. This photograph, dated June 22, 1943, is a view north from the concrete platform on the west side of the warehouse to the three-story Optical Shop. The northwest corner of building M-4 is visible in the photograph, and it documents doors on the west elevation of the building identical to those which are presently visible. This is reproduced as Plate 15 in the Stage I Cultural Resources Survey of the E.P.A. Edison Facility, but the details that are clear in the original photograph are impossible to make out in reproduction.

C. Interviews: No interviews were undertaken for this project.

D. Bibliography:

1. Primary and unpublished sources:

Conrad, C.K., Major. Report on the Construction of Raritan Arsenal, Metuchen, N.J. Bound typescript. 1919  
R.G. 77, Entry 391, Box 264, Suitland Reference Branch National Archives, (NNRR) Suitland, Maryland.

Raritan Arsenal History, Vol. I, Part 2, 1919-1942.  
R.G. 156, Entry 646, Box 225, (NNRR).

Raritan Arsenal, New Jersey. Completion Reports of Various Construction Projects, 1920-1937. R.G. 77, Entry 391, Box 264, (NNRR).

Records of the Office of the Chief of Ordnance, Vol. 106.  
Bound volume of Raritan Arsenal Photographs (ca. 1943).  
R.G. 156, Entry 646, Box A234, (NNRR).

United States Environmental Protection Agency, Region II, New York, New York. Stage I Cultural Resources Survey, U.S. Environmental Protection Agency Edison Facility, Edison Township, Middlesex County, New Jersey. October 1990.

IV. PROJECT INFORMATION

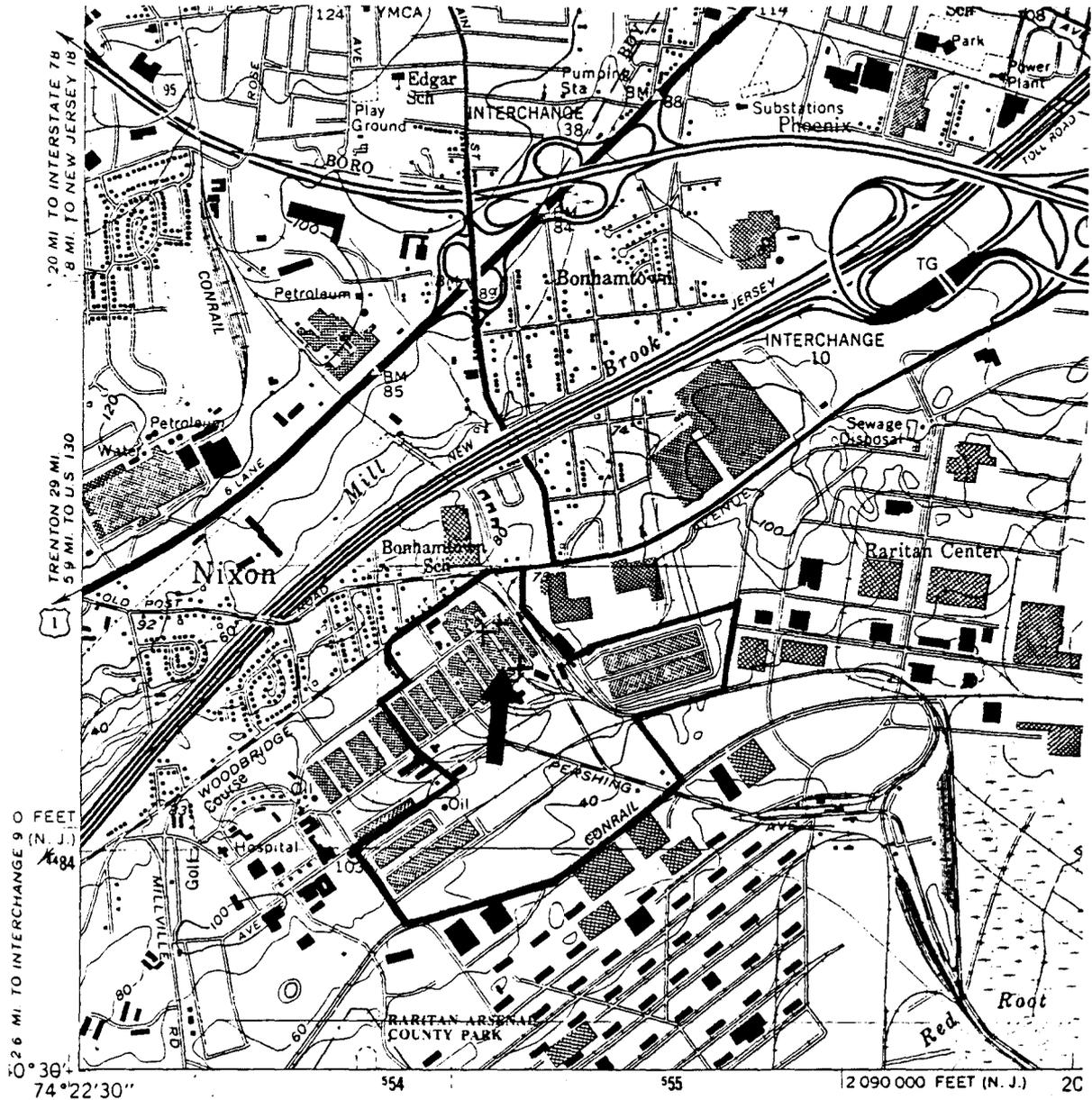
Documentation for Warehouse M-4 was undertaken at the request of the U.S. Environmental Protection Agency under the terms of a Memorandum of Agreement between the U.S. Environmental Protection Agency, the Advisory Council on Historic Preservation, and the New Jersey State Historic Preservation Officer, dated June 1992.

Research was carried out by Janet W. Foster, of Acroterion, Historic Preservation Consultants, P.O. Box 950, Madison, New Jersey, 07940. Photography was done by E. Kenneth Hoffman, 14 Hill Street, Morristown, New Jersey, 07960.

PROPERTY SITE PLAN

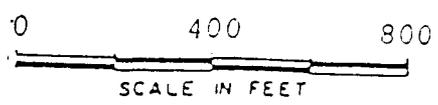
Map showing the extent of the Raritan Arsenal now owned by U.S. E.P.A. Arrow points to subject building.

Base map is USGS Perth Amboy Quad (1956, photorevised 1981), 7.5 minute series.



PROPERTY PLOT PLAN

Map of the E.P.A.-owned property which includes part of the former Raritan Arsenal. Arrow points to subject building. Base map is from Figure 17 of the Stage I Cultural Resources Survey, U.S. Environmental Protection Agency Edison Facility, 1990.



SKETCH FLOORPLAN  
Not to scale

