NPS Form 10-900-a
(8-86)

OMB Approval No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number _____ Page _____

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 01000891 Date Listed: 8/22/2001

Property Name: New Milford Plant of the Hackensack Water Company
County: Bergen State: NJ

_____
Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Patrick Andus 8/22/2001
Signature of the Keeper Date of Action

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Amended Items in Nomination:

This SLR amends the Period of Significance by extending it to 1931 and makes a technical correction to the form regarding acreage. The registration form justifies extending the Period of Significance to 1931 to include the period in which the plant experimented with and implemented the use of carbon filtration, a significant aspect of the plant's history. In section 10 of the form, acreage is given as "11 acres (approx)." The Tax parcel map, which serves as the boundary, shows that the acreage of the nominated area is 13.31 acres. The registration form is officially amended to expand the Period of Significance to 1931 and to clarify the acreage figure at 13.31 acres

_____

NPS Form 10-900
(Oct. 1990)

OMB No. 10024-0018

891

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 *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name New Milford Plant of the Hackensack Water Company

other names/site number _____

2. Location

street & number New Milford Avenue ☐ not for publication

city or town Oradell, ☐ vicinity

state New Jersey code NJ county Bergen code 003 zip code 07649

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 ☒ nationally ☐ statewide ☐ locally. (☐ See continuation sheet for additional comments.)

_____ 6/21/01
Signature of certifying official/Title Date

_____
State of Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See continuation sheet for additional comments.)

_____
Signature of certifying official/Title Date

_____
State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:

Signature of the Keeper Date of Action

☑ entered in the National Register. ☐ See continuation sheet. — Patrick Andrus — 8/22/2001

☐ determined eligible for the National Register ☐ See continuation sheet. — _____

☐ determined not eligible for the National Register. — _____

☐ removed from the National Register. — _____

☐ other, (explain:) _____ — _____

New Milford Plant-Hackensack Water Co.
Name of Property

Bergen, NJ
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply)

- ☐ private
- ☒ public-local
- ☐ public-State
- ☐ public-Federal

Category of Property
(Check only one box)

- ☒ building(s)
- ☐ district
- ☐ site
- ☐ structure
- ☐ object

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

Contributing	Noncontributing	
2	0	buildings
		sites
1	0	structures
		objects
3	0	Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
(Enter categories from instructions)

INDUSTRY/ ~~Water purification&distribution~~

Current Functions
(Enter categories from instructions)

~~VACANT/not in use~~

7. Description

Architectural Classification
(Enter categories from instructions)

Late Victorian
Industrial Romanesque Revival

Materials
(Enter categories from instructions)

foundation Sandstone/Brick
walls Brick
roof Slate
other

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

Please see Continuation Sheet #1

New Milford Plant-Hackensack Water Co. — Bergen, NJ
Name of Property — County and State

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.)

Property is:

- [ ] **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 of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

Industry-Water Purification & Distribution
Settlement & Community Development
Architecture
Engineering

Period of Significance

1882-1914

Significant Dates

1882
1902-1904
1912-1914

Significant Person
(Complete if Criterion B is marked above)

Cultural Affiliation

Architect/Builder
Charles Benjamin Brush
Myles Tierney

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- [ ] 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 # _____

Primary location of additional data:

- [X] State Historic Preservation Office
- [ ] Other State agency
- [ ] Federal agency
- [X] Local government
- [ ] University
- [ ] Other

Name of repository:
County of Bergen

New Milford Plant-Hackensack Water Co.
Name of Property

Bergen, NJ
County and State

10. Geographical Data

Acreage of Property 11 acres (approx.)

UTM References
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing
1	18	582220	4532970
2	18	581920	4532990
3	18	581985	4533300
4	18	582200	4532200

☐ See continuation sheet

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Albin H. Rothe, RA, NCARB, PP

organization Rothe Architects-Planners, Inc. date

street & number 180 Franklin Turnpike telephone (201)529-8102

city or town Mahwah state NJ zip code 07430

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A Sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional Items
(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO.)

name The County Of Bergen, Administration Building

street & number 21 Main Street telephone (201)646-3630

city or town Hackensack state NJ zip code 07601-7000

DESCRIPTION:

The Hackensack Water Company/United Water Resources (The Water Co.) owned 46.8 acres of land consisting of nine parcels, consisting of islands in, or land adjacent to the Hackensack River. The only developed and historically significant area is about 15.8 acres, on which is located the New Milford Plant of the Hackensack Water Company. Although the Plant is historically known as the New Milford Plant..., it is physically located in Oradell, New Jersey since the division of the site from Old New Milford.This facility was closed in December, 1990, and replaced by a new installation located in Haworth, New Jersey. In 1993, this site was deeded to the County of Bergen, the present owner.

The subject site is located on what is historically known as Van Buskirk Island, bordered by New Milford Avenue on the south, Elm Street on the east and the Hackensack River on the north and east. On the site is located a network of roadways, buildings, the coagulation/settling basin, pipes, culverts, tanks, chimneys and other structures, all associated with the former Water Co. operations. Much of the site is covered with water circulation, filtration and distribution systems, most of which are underground. Almost all of the site is in the federally designated flood plain or flood fringe, except for the tops of the embankments that form the perimeter of the Coagulation/Settling Basin. (Hackensack Water Co. Fact Sheet, undated)

No physical evidence of any prior structures or development can be seen, with all of the site substantially disturbed by Water Company development through the period from c.1882 to the date of its closing.

The principal structures on the site are the Pump Station (Pump House), c. 1882-1911, the Filtration Plant, c.1903-1955, and the Coagulation/Settling Basin, c.1903-1906.

THE PUMP HOUSE: Consists of eight sections totalling about 24,500 square feet of ground floor area. The various sections were built from c.1882 to 1911, and shown as Sections 1A, 1B, 1C, 1D, 1E, 1G, 1F, and 1F-G on the attached plan. Functions and dates of each section are as follows:

1A: Pumphouse; earliest building, built c. 1882 (datestones, Leiby).
1B: Original use unclear, probably used as a pumphouse since c.1915; built after 1882 and probably by the mid-1880's (Sheffield, Leiby).
1C: Original use is unclear, used as a pumphouse since mid-to-late 1880"s; built after 1882 and probably by the mid-1880's (Sheffield, Leiby).
1D: Pumphouse; built c. 1898 (datestones, Leiby).
1E: Boiler house; built c. 1898 (south end and square chimney) (Leiby).
1F: Boiler house; extension of 1E; c.1905-1906. (Sheffield, Leiby).
1G: Pumphouse; built in 1911 (datestones; Leiby).

DESCRIPTION (CONTINUED):

PUMPHOUSE (CONTINUED):
Shown on: 1912 *Atlas*, vol. 1, plate 20.
Filter Plant Drawings - *General Plan*, 122-16/03-1, August 1903 (shows 1A, 1B, 1C, 1D, south end of 1E and square chimney).
Other - *New Milford Pumping Station, Piping Plan*, 122-21/147-10, June 14, 1944 (shows 1A, 1B, 1C, 1D, 1E, 1F, 1G).

The series of additions traces the continual expansion to meet the increasing needs of the service area. It is noted that the Water Co. plans refers to the westerly sections as the "Pump Station", with the easterly sections known as the "Boiler House". The function of this building was to pump water from the Hackensack River to the various stages of the filtration and treatment process, by giant pumps and turbines, originally steam driven, but by electric power for the more recent pumps. Large boilers which produced the steam are still extant. The capacity of the Plant was 120 million gallons per day.

All sections are built in the Industrial Romanesque Revival Style, of exterior brick bearing walls of red brick laid in common bond with red tinted mortar, and with headers every sixth course horizontally. The roof of the c. 1882 section is exposed wood plank and beam (heavy timber) construction. All other roof framing is exposed steel trusses with timber planks.

All roofs on the major structures have square-cut slates with copper ridge trim and flashings. Projecting eaves have exposed rafters with plain or decoratively cut ends. The Pumphouse sections were built with hipped roofs, and the Boiler Houses were built with gable roofs. Section 1A has a large square roof monitor with four 16 pane divided light windows on each side, adding needed natural light to the interior. Section 1C and 1D have a long, narrow roof monitor running in an east-west direction, also with divided light windows. The monitor windows may have originally been louvers, as is shown on the original 1881 design drawings.

The exterior elevations of the buildings do not clearly reflect the interior floor plans. All interior spaces have a main floor level located at the approximate exterior grade. Except for Boiler Room 1F and Area 1F-G, which are multi-story and reached by interior stairs, all interior spaces are open to the underside of the roof. Sections 1A, 1B and 1C, known originally as the "Engine House", are one story high. Section 1D appears to be two stories from the exterior, with two levels of windows but in open to the underside of the roof. Section 1G has three levels of windows and roof dormers, appearing to be 3-1/2 stories high from the exterior, but is also open to the roof similar to the other sections. This clear height in Section 1G was needed to house the massive equipment, particularly Pump #7, which is about 30 feet high, or the equivalent of about

DESCRIPTION (CONTINUED):

PUMPHOUSE (CONTINUED):three stories. Pump No. 7 and some of the other equipment have elevated metal walkways and open stairs for access.

The foundations are projecting sandstone in a rusticated ashlar pattern and tooled faces, capped by a cut stone watertable, on the exterior for Sections 1A, 1C, 1D and 1F. The foundation for Section 1D is not visible. None of the interior of the foundations were able to be inspected. All sections have "basements" housing an intricate network of pipes, water wells, or reservoirs, work areas and access stairs and walks. Many masonry or concrete foundations or piers support pump and other equipment above.

The fenestration is quite varied, although the dominant pattern is wood double hung windows with divided lights, some 15/15, some 16/16 and a few of varying patterns, including fixed divided light windows. Round ocular windows occur over some doorways. Windows at the ground floor generally have arched heads of moulded brick; however, all windows have the arches filled with brick to form a flat window head. Windows at the second levels have flat brick arches; the second level windows in Section 1G are paired double hung wood with divided lights. The third level windows in Section 1G are triple. Hipped roof dormers occur at Section 1G.

According to the 1881 design drawings (Leiby), the grade around the Pump House was originally lower that at present, with windows at the basement level on the south side of the original "Engine House" (Sections 1A, 1B and 1C). Steps with about five risers occurred at all entrances.

GENERAL COMMENTS - SECTION 1A: WEST ENTRANCE FACADE: has gabled roof pavilion projecting slightly from west wall. Central entrance has paired, half glazed panelled wood doors under arched and divided light glass transom. Arch is formed of moulded brick with moulded brick imposts. Moulded terracotta date medallions encircled by moulded brick are located above and to either side of the arch: "18" to the north side, and "82" to the south, forming the date of "1882". A band of stepped bricks marks the roofline under the pavilion gable, in the center if which is a multi-paned glass oculus set within a circle of moulded brick. A wood bargeboard finishes the gable roof end. This Section is quite similar to the 1881 drawings (Leiby, attached), except half-glazed doors in place of the wood panelled doors shown, awning windows in the roof monitor in place of the louvers shown, and the raising of the grade previously noted.

SOUTH FACADE: projecting gabled pavilion similar to that at west entrance except for a pair of wood windows, each with double hung sash, 20/20 divided lights, under arched leaded multi-paned transoms, which replace doors in the west entrance.

INTERIOR: The north and east interior walls show clear evidence that they were originally exterior walls, since they are brick and retain round arch headed window openings with sash channels.

ENGINEER/ARCHITECT: Charles Benjamin Brush (Leiby)

DESCRIPTION: (CONTINUED):

GENERAL COMMENTS - SECTION 1B: SOUTH FACADE: Connects to Section 1A along the south wall below Section 1B's gable. Has a pavilion projecting from the center of the south wall, very similar to the pavilion in the south wall of Section 1A, except there is a small square multi-paned window with moulded brick surround over the center of the paired windows. The bricks of the south walls of Sections 1A and 1B do not match, and it appears that 1B was built soon after Section 1A. Section 1B was probably built built before Section 1C since the east gable is a logical extension of Section 1A. (Sheffield) Its scale, brick exterior walls and decorative details complement those of Section 1A, most evident in the similar window designs of the south walls.

EAST FACADE: Entrance on east side has paired, half-glazed wood doors, under an arched divided light, multi-colored glass transom. Centered over the doors in an oculus with divided lights, multi-colored glass, set in a circle of moulded brick, similar to the south side.

INTERIOR: Exposed roof decking is wood with timber chamfered tie beam and kingpost.

ENGINEER/ARCHITECT: probably Charles Benjamin Brush

GENERAL COMMENTS - SECTION 1C: WEST FACADE: Central entrance bay projects slightly from the west wall. Paired, half-glazed wood doors under an arched and divided light glass transom, are set within a moulded brick arch with moulded brick imposts. Windows on either side of of the entrance each are double hung, 20/20 panes, and rough-faced sandstone lug sills. Each also has an arched divided light glass transom set under a moulded brick arch with moulded brick imposts. The roof monitor openings are now sealed with temporary plywood panels. A concrete pad and centered ramp abut Section 1C's west wall , with a metal hatch covered entrances to the below-ground level are in the pad. Section 1C's west wall is set in from Section 1A's, and the brick at the joint between do not match. It appears that Section 1C was built soon after 1882, probably after Section 1B. Section 1C's design complements Section 1A's in scale, massing, roof shape, fenestration, brick exterior facade and west wall exterior decorative details.

INTERIOR: Exposed roof decking is wood with timber chamfered tie beam and kingpost.

ENGINEER/ARCHITECT: probably Charles Benjamin Brush

Section 1C appears in Leiby's *History* (p.68) in a photograph dated c. 1885, showing the west facades of Sections 1A and 1C.

GENERAL COMMENTS - SECTION 1D: WEST FACADE: One story high but appears two stories from exterior, with two levels of windows. Central entrance bay projects slightly from the west wall, for one bay only, finished with a rough-faced sandstone cap. Paired, half-glazed wood doors are slightly larger than those at Sections 1A and 1C but are set in a brick arch very similar to Section 1A. Moulded terracotta date medallions, similar to Section 1A, have the number "18"in the north medallion and "98" in the south, for the date of "1898". Windows at the lower level, on either side of the entrance doors, are very similar to those on the earlier sections. The windows at the upper level are also similar, except that the heads are flat brick arches with 15/15

DESCRIPTION: (CONTINUED):

GENERAL COMMENTS: SECTION 1D: WEST FACADE(CONTINUED): double hung wood sash. A moulded brick belt course runs across the west facade over the upper windows, and under the roof eave. A concrete pad abuts the west wall, with metal hatch entrances in the pad.

Section 1D was designed and built about 16 years after Section 1A, yet there is clearly a conscious effort to harmonize the style, design and detailing through the use of similar scale, massing, roof shape, brick exterior walls and west wall decorative details.

CONTRACTOR: Possibly Myles Tierney

GENERAL COMMENTS - SECTION 1E-1F: NORTH FACADE: First story: Three windows at west end have double hung wood 1/1 sash, and are probably replacements. Door at east end is half-glazed metal, replacement. Second story: Three windows in a band under the gable, with a continuous brick sill. Each window is under a brick arch.

WEST FACADE: Not visable from the street or north yard. Brick chimney, about 110 feet high, near the center of the west side, square in plan, tapers to a brick band and brick corbels below the cap. The chimney is part of the c. 1898 construction of Sections 1D and 1E.

EAST FACADE: Alterations to windows and exterior wall openings evident. Former wall opening for breeching of the circular brick chimney in the east yard is at the north end. This opening was sealed c 1967 or possibly earlier. Near the gable roof's east center is a shed dormer, seven bays long. There is a hipped roof, three story projection at the center of the east wall.

SOUTH FACADE: First story: Entrance in east end has a single, half-glazed wood door in a double width space, divided light window at west of door, both under a an arched divided light tramsom. Window at west end has a rough-faced sandstone sill, double hung sash, 20/20, under a single pane glass transom with an arch of flush soldier coursed brick. Second story: Below the gable ridge is a round louvered vent. Between the south wall of Section 1E and the north wall of Section 1B is a one-story section with brick walls, three bays (paired, half-glazed doors and two divided light windows), a flat roof and central hipped metal frame glass monitor. This may have been built before or about the turn of the century. The west wall and square chimney of 1E appear in Leiby's *History* (p. 132) in a photograph of the plant, c. 1906, showing the west wall of Section 1E and the west facades of 1A, 1C and 1D, and the south facade of the Water Filtration Plant, Section 2A. The south end of 1E and its square chimney (both directly behind Section 1D) were built c. 1898 to hold the boilers to generate steam for the pumps in Section 1D (Filter Plant Drawings, *General Plan,* 122-16/03-1, August 1903). Section 1F, extending from Section 1E to the north, was added in 1905-06 to house additional boilers to generate steam for the pumps in Sections 1A, 1C and 1D. Sections 1E and 1F were converted to chemical storage about 1967.

CONTRACTOR: possibly Myles Tierney

GENERAL COMMENTS - SECTION 1G: WEST FACADE: First "Story": Central entrance bay is flush with the west wall. Paired, half glazed wood doors are set under a moulded brick arch

DESCRIPTION (CONTINUED):

GENERAL COMMENTS - SECTION 1G: WEST FACADE: First "Story" (CONTINUED): and divided light glass transom. Moulded terracotta date medallions, similar to the others, are set in either side of the arch and have the number "19" in the north and "11" in the south, forming the date of "1911". Windows on this level are wood double hung wood 20/20 sash under gauged brick arches and moulded brick inposts, with rough-faced sandstone lug sills. Second Story: Windows are each paired wood double hung 15/15 sash with rough-faced sandstone log sills and gauged brick flat arch lintels. Over these second "story" windows is a belt course of moulded brick. Third "Story": Windows are grouped in three's, wood 6/6 sash. Upper sash are awning windows. Rough-faced sandstone lug sills and corbelled brick courses below each window grouping in a rectangular pattern.

NORTH FACADE: Repeats form, pattern and detailing from the west facade.

EAST FACADE: Only visable from the north yard. Has fewer and less elaborate details - no belt course, sills and brick arches over the first "story" windows, which are flush with the wall.

INTERIOR: Brick walls are exposed and unfinished. Flooring is composed primarily of metal gratings and plates with stairs and platforms rumming up and down to access equipment.

Although designed and built more than 25 years after Section 1A, Section 1G continues the earlier design's decorative features: style, roof shape, some fenestration details (entrance and first "story" windows, exterior brick walls and brick bond. The Pump House complex is the "heart" of the facility, housing the water pumping system serving not only the on-site circulation for treatment and purification, but also for distribution throughout the Water Company's extensive service area.

CONTRACTOR: Myles Tierney and son, John C. Tierney

(See *ELEVATIONS OF ENGINE AND BOILER HOUSES* attached for details)

COAGULATION/SEDIMENTATION BASIN: This is a 285' x 415', 70,000 sq. ft. open pool type structure formed by 25' high earthen embankments lined with concrete and masonry. The capacity is 12,000,000 gallons at a depth of 20.5' at high-water level. The bottom of the structure appears to be below the bed of the Hackensack River, and the top of the embankment is reported to be the only area on site which is above the 100 year flood line. The function of this structure was to receive the water pumped from the River through the Pump House, and into the Basin to allow solids and debris to be "settled out" and removed before being circulated into and through the Filtration Plant. The condition of this structure could not be determined due to the special nature of the construction, materials and use.

THE FILTRATION PLANT: This is the largest building on the site, covering about 50,300 sq. ft., built in four sections, c. 1903-06, 1912, 1934 and 1955. Functions and dates of each section

DESCRIPTION (CONTINUED):

THE FILTRATION PLANT (CONTINUED): are as follows:

2A: Sometimes referred to as the Coagulation House, includes laboratory and tanks for chemical additives and earliest sections of filters; built 1903-1906, addition in 1912.
2B: Expansion of filtration plant; built c. 1934.
2C: Expansion of filtration plant; built 1955.

Shown on: 1912 *Atlas*, vol. 1, plate 20.
Filter Plant Drawings - *General Plan,* 122-16/03-1, August 1903.
- *Front Elevation of Superstructure,* 122-16/03-21, December 1903 (south facade)
- *Side Elevation of Superstructure,* 122-16/03-22, December 1903 (east facade)
- *Rear Elevation of Superstructure,* 122-16/03-23, December 1903 (north facade)
- Construction drawings 122-16/03-24 to 52, January 1903 through October 1904

The function of this building complex was for water filtration and chemical additives for purification. The water was pumped from Coagulation/Sedimentation Basin, then into the series of massive filtration chambers in this structure. After filtering and treatment, the water entered the distribution piping system to the Water Co. service area.

The southerly section, closest to the Pump House, is the earliest, and built in the Industrial Romanesque Revival Style, very similar in design and construction to the Pump House. This section of the Filtration Plant consists of a central three story "tower" with two symetrical wings, each two stories high. To the north is a one story section housing the earliest filter chambers. This section is built in a vernacular 20th century style, devoid of the classical architectural detailing appearing on the southerly multi-story section. The most recent c. 1955 section,extending the number and area of filter chambers, is in a vernacular modern style with some International Style influence.

The two side wings of the southerly section are divided into one story storage rooms, work rooms and the laboratory in which occurred significant research and experimentation into water treatment technology. The grade level of the central "tower" area is the entrance into the Filtration Plant. The upper floors of the "tower" house tanks for the chemical treatment of the water circulated through the system, including the introduction of carbon and alum into the water to enhance filtration and purification.

The general construction of the Filtration Plant is exterior brick bearing walls and steel roof trusses with "3 (inch) hollow roofing tiles" as shown on the detailed construction drawings dated 1903 and 1904. Roofing is slate. Fenestration is similar to that for the Pump House. Foundation

DESCRIPTION (CONTINUED):

THE FILTRATION PLANT (CONTINUED): walls are brick masonry supported on massive poured concrete walls which are part of the filter chambers below.

EQUIPMENT-PUMP HOUSE: Filled with a substantial amount of equipment consisting principally of both steam and electric powered pumps and turbines, boilers to generate steam, and various valves, meters and controls. Although some of the equipment has been replaced, the evolution of this phase of water treatment and distribution technology can be traced through the range of intact equipment, at least some of which are considered historically significant. The Pump House contains a treasure trove of high capacity water distribution equipment and facilities, ranging in date from 1882 to recent years, in various states of condition.

EQUIPMENT-TREATMENT PLANT: Except for the southerly section, this building is designed as an elevated central arcade containing the control modules, flanked by a series of connected concrete tanks forming an understructure for the building. Most of the equipment associated with the treatment process in this building is contained in or below the control modules and is not very visable, except in the upper floors of the central tower of the southerly section. Here the large tanks, previously noted, and connecting pipes are controlled primarily by valves, with a limited amount of mechanical equipment.

GENERAL CONDITION - ALL BUILDINGS: Based upon visible elements of the buildings, no indication of foundation movement or settlement was seen, since the walls, columns and floors appear to be aligned and free of displacement, major cracks or other evidence which should be visible if movement or settlement of the foundations had occurred. Site and detailed plans show that the building and equipment foundations are very substantial and extend below frost line. The exterior masonry walls above grade appear to be structurally sound, except for a fairly large vertical crack near the northeast corner of the Pump House, which crack should be repairable. cost. The slate roofing appears to be in reasonably good condition, although it was not possible to carefully inspect same. It should be expected that the slate roofs would not need full replacement, but some amount of repairs, such as replacing of missing or broken slates and repairs and/or replacing of flashings, may be necessary.

It appears that all the buildings and structures were well maintained by the Water Co. until recently. The substantial original construction combined with the high quality of the maintenance and lack of visible indications of major repairs being necessary, would indicate that the buildings are in structural condition sufficient to adaptively reuse these buildings.

All exterior doors in the Pump House and Filtration Plant have metal flood control doors, about 3' high, attesting to the site being located in a flood zone.

SIGNIFICANCE:

The New Milford Plant of the Hackensack Water Company district is important in the history of the development of Northern New Jersey. Suburban growth of this area would not have been possible without the domestic water supplied by this waterworks. The district is a well preserved complex of industrial buildings and structures which show the evolution of the waterworks from its inception in 1882, when the first building was erected, until the present.

The Plant is architecturally significant since most of the buildings retain their Industrial Romanesque Revival style, continuing the design influence of the original 1882 "Engine House". By 1914, the architecture of this complex was established and remains substantially intact, retaining much of its appearance of that era.

The facility houses a substantial amount of equipment, many items of which are rare surviving examples of early water treatment and distribution technology. An exceptional piece, known as Pump #7, is a huge Allis Chalmers triple expansion steam engine (pump) installed in 1911. It is in excellent condition having been recently reconditioned, and was usable as a back-up pump.

The site, buildings and much of the equipment contained in the Pump House are historically significant, as has been acknowledged by, as follows:

HISTORIC SITES INVENTORY 0238-D & 0444-D1:
NEW MILFORD PLANT OF THE HACKENSACK WATER CO.
ORADELL AND NEW MILFORD
by the Bergen County Office of Cultural and Historical Affairs, 1981.

HISTORICAL STUDY AND EVALUATION OF THE HACKENSACK WATER CO. NEW MILFORD FILTRATION PLANT AND PUMPING STATION
BOROUGH OF ORADELL, BERGEN COUNTY, NEW JERSEY
by Sheffield Archeological Consultants, 1991

CERTIFICATION OF ELIGIBILITY
State of New Jersey Department of Environmental Protection, Division of Parks and Forestry, Historic Preservation Office, Dorothy P. Guzzo-Administrator, Sept. 16, 1996, which Certification states, in part:

"Based upon a review of the submitted documentation together with material already on file, it is my opinion, as Deputy State Historic Preservation Officer, that the New Milford Plant of the Hackensack Water Company is eligible for listing in the New Jersey and National Registers of Historic Places under Criterion C for its industrial architecture and engineering and under Criterion A for its association with significant events associated with the broad patterns of economic development in Bergen County."

SIGNIFICANCE (CONTINUED):

The Hackensack River Valley, the name Hackensack being derived from an Indian name generally referring to the many bends in the River (Sheffield 1991), was considerable settled and used for subsistence activity long before settlement by the Europeans; however, there are no recorded prehistoric (Indian) sites within the Water Company property. "Lacking any direct or anecdotal evidence of Indian occupation within the study area, we feel that this area has a low probability for the presence of such resources. Additionally, we observe that the area has seen intense commercial use and extensive development throughout historic times. Thus, any Indian sites that may have been present within the study area would have been subject to disturbance" (Sheffield 1991:6).

With the completion of the Hackensack and New York Railroad in 1869, which connected Hackensack to New York City, unprecedented growth developed in Bergen County and its surrounding area. In 1872 the New Jersey Midland Railroad connected New York and Jersey City to western New York state and the Great Lakes, running through Hackensack and north along the west side of the Hackensack River through "Old New Milford". Towns along the river and the railroad expanded rapidly (Leiby 1969:1-11).

By 1869, it was obvious that burgeoning Hackensack (the seat of Bergen County) could not long continue to rely on back-yard wells and cisterns for a water supply. In fact, two important local people were already taking steps to promote a public system. Charles H. Voorhis, probably acting for his client, G.N. Zingsem, had obtained a charter for a Cherry Hill Water and Gas Company two years earlier, but had not yet put it to use. More recently, Garret Ackerson had been seeking a charter with somewhat more extensive powers than the Cherry Hill charter. He proposed to form a Hackensack Water Company to serve the village and the surrounding country and for that purpose to use any of the nearby streams. In those days charters were granted by special Acts of Legislature. The Hackensack Water Company bill passed the Senate without opposition on February 24, 1869, and on March 12, 1869, Governor Randolf signed it into law (Leiby 1969:12).

Both Voorhis and Ackerson were highly successful Jersey Dutchmen, strongly connected with the Dutch Church, and both politically active, Voorhis on the local and even national level and Ackerson rooted in more local Bergen County politics. In 1864, Voorhis was a delegate to the national convention that renominated Lincoln, and he was said to be a personal friend of both Lincoln and General Grant, who had few enough supporters in Bergen County or elsewhere in New Jersey. Voorhis had been one of the first to anticipate the land boom that had burst upon Bergen County, acquiring large amounts of acreage. He became a supporter and shareholder in the Midland Railroad and a bondholder in the New Jersey and New York Railroad (*Bergen County Democrat, June 15, 1877).*

Garret Ackerson, Jr., the other holder of a water company charter, was not as well known outside

SIGNIFICANCE (CONTINUED):

of the County; however, he was well respected and prided himself on his quick wits and standing in the community. As the undisputed leader of the dominant Democratic party in the County, no one doubted that he knew the uses of power. Ackerson was one of the founders of the Hackensack Gas Light Company in 1867, and when the Hackensack and New York Railroad found itself in financial difficulties, it was Ackerson who was called on to step in as president to save it. In seeking the water company charter, Judge Ackerson named as fellow incorporators Eben Winton, Richard R. Hawkey, John H. Banta and Samuel Sneden, all respected citizens of Hackensack, favorably known in Trenton and pillars of the Democratic party. It may be doubted that they had much financial interest in the new water project (Leiby 1969:24-25).

On September 24, 1869, one of many subsequent days known as "Black Friday", the stock market crashed as a result of gold speculation and President Grant's governmental actions to break the speculator's strangle-hold. The autumn of 1869 was hardly a time to seek new capital for Ackerson's Hackensack Water Company, or for Voorhis' Cherry Hill Water and Gas Company either. By this time, both Ackerson and Voorhis were deeply involved in banking, and had probably put water out of their minds. By 1873, however, the public was clamoring to solve the pressing need for potable water, due to the substantial growth of Hackensack and surrounding area. Ackerson offered subscription to the capital stock of the Hackensack Water Company, and to his surprise his arch-rival, Charles H. Voorhis, subscribed for the controlling interest. Voorhis evidently saw that if he wanted to build a water system, the Ackerson charter was far better than his own limited Cherry Hill charter (Leiby 1969:29-36).

Once controlling the charter, Voorhis proceeded with great energy to build the water system, bringing in one of New Jersey's most able engineering and construction firms, Bacot & Ward of Jersey City. R.C. Bacot had spent many years pioneering railroad development, but located to Jersey City in 1839, at the age of 21, where he laid out most of the streets, and was the architect for most of its early public buildings, schools, churches and jails, as well as many private homes. He was later in charge of Jersey City's water system, where he introduced water meters for large consumers, a plan later adopted by New York City and other public systems (Leiby 1969:36-38).

Despite hard times, Voorhis pushed ahead with the waterworks system. The plan was to build a brick-lined reservoir north of the village of Hackensack, on a high hill on John C. Zabriskie's farm, not far from the Hackensack River from which water would be pumped, to flow down to the village by gravity. The hill had been known as Brower's Hill during the Revolution, when it held American defense works, but was later known as Zabriskie's Hill, after the family that had owned it for generations. Commencement of water service to the village of Hackensack occurred on October 21, 1874. The system was successful and residents, finding the water pure and wholesome, boasted that it was better than New York City's Croton water (Leiby 1969:42-47).

SIGNIFICANCE (CONTINUED):

The Panic of 1873 had not ended by October 1874; in point of fact, it was to not end for six or seven years, and business was to get far worse before it got better. At first, the Water Company seemed relatively untouched by the holocaust. The *New Jersey Citizen* for January 15, 1875, carried a long technical article by Professor Albert R. Leeds of Stevens Institute pointing out that the Hackensack River would easily provide 20,000,000 gallons a day, enough to supply the City of Hoboken and provide for thirty years growth. But by 1878, the Water Company had been trying to sell $500 bonds carrying seven per cent interest free of tax, with no success even at a 10% discount. Few water customers were paying their bills, and many others had discontinued service. Even the the Hackensack Improvement Commission was obliged to default on its hydrant rents (Leiby 1969: 49-53).

By March, 1879, Judge Voorhis publically admitted the Water Company could not pay its debts, and the *Democrat* for April 4th reported that the Honorable A.A. Hardenburgh of Jersey City had been appointed its receiver at the suit of Bacot & Ward, the contractors who built the system. In October, 1979, Voorhis conceded that he could no longer meet his own debts as they accrued, and made an assignment for creditors. By 1880, the Water Company had been acquired by Bacot & Ward, who held a large number of bonds taken in payment for its construction. They formed a new company, The Hackensack Water Company Reorganized, with William S. Banta as President, John F. Ward as Secretary and R. C. Bacot as Treasurer. Garret Ackerson was one of two outside directors (Leiby 1969:53-57).

As an interesting asside, it appears that water powered motors, using Water Company supplied water, were in use in Hackensack in 1881. Leiby reports that, due to a water main break, "the water motor in the *Democrat* office was quiet". However, he also notes that water motors were not very satisfactory sources of power, no doubt the Water Company getting more than its fair share of publicity for the *Democrat's* troubles with water-powered presses (Leiby 1969:59).

The Water Company officials, however, had something on their minds besides the complaints of the *Democrat*. They were negotiating for a ten-year contract to supply water to the City of Hoboken, calling for payment to the Company of $75,000 a year, a project that would involve millions of dollars of capital and a complete change of the source of supply from Cherry Hill to a point further up the river. As a result of the successful negotiations with Hoboken, new directors were elected at the 1881 meeting, including Garret A. Hobart, who had successfully revived the New Jersey Midland Railroad, and later became Vice-President of the United States.

Hoboken had a population in May, 1881 of 30,000 and was growing rapidly due to its "very superior harbor" and close proximity to New York City, where many Hoboken residents worked, finding living costs to be much less in the smaller city. In September, 1881, Hoboken awarded a formal contract to the Water Company, to take effect November 1, 1882. The controlling Bacat

SIGNIFICANCE (CONTINUED):

and Ward interests, not having the large capital resources necessary to complete a line to Hoboken, had negotiated a contract to sell the Company on condition that the Hoboken contract was granted. Immediately after the referendum vote on November 9, 1881, the board was reorganized with W.W. Shippen, Daniel Runkle, Julian H. Kean and Robert W. deForest taking the places of the Bacot and Ward representatives. Mr. R.C. Bacot himself tendered his resignation, but was asked to continue as President and director.

W.W. Shippen was executor of the Stevens Estate and representative of the Stevens family interests. Mr. Shippen died in 1885 and was succeeded by Edwin A. Stevens, his brother-in-law, whose father had founded and endowed the Stevens Institute of Technology in 1871. Robert W. deForest was a New York lawyer and capitalist, and Daniel Runkle was a member of the family controlling the Warren Foundry, which was to supply the miles of pipe needed for the new project. Julien H. Kean was a menber of the wealthy Elizabeth family prominent in utility, banking and public affairs in the State (Leiby 1969: 59-66).

When Mr. deForest and the other new directors were appointed, they wasted no time pushing ahead with their new project. By November 25, 1881, they had purchased eleven acres of land and the mill of J. & H. Van Buskirk at New Milford, for $50,000 in cash. (Note that at that time the present-day Borough of Oradell included the "old communities" of Oradell and New Milford) Leiby reports that the mill-site was a very old one, with a County history of 1882 saying that the first structure was erected before the Revolutionary War and used at that period as a saw mill. It later was also used as a tannery and bleaching mill, for button manufacturing, a grist mill, and most recently (1881) for the manufacture of flour.

The island on which the New Milford Pumping Station was built was the scene of commercial activity dating back to at least the early eighteenth century. At its strategic location at the headwaters of the Hackensack River, which was the main shipping route for north/south travel in the river valley, the island became the docking port at the northern terminus of the navigable portion of the River. Thus, this site was instrumental in the European settlement of the New Milford/Oradell area, which area is believed by many historians to be the earliest settlement in Bergen County and possibly in northeast New Jersey.

The area at the southern end of the island became known as the "Old Dock", "Upper Landing" or "Old Landing" and was the official "Head of Navigation" on the Hackensack. Jacob Van Buskirk had a schooner built in 1855, which ran a regular course from "Old Dock" to New York City with grain and flour, and was known to have gone to North Carolina along the intercoastal waterway for cedar shingles.

SIGNIFICANCE (CONTINUED):

The land included a "new" mill which reportedly replaced an earlier mill from the 1830's. A c. 1880 photo of the "new" mill is in Leiby's book on p. 66. The 1876 Atlas of Bergen County by A.W. Walker includes a map of a portion of New Milford, Milford Township, which map shows the island and extent of development at a time five years prior to the the Hackensack Water Company's purchase of the site. The three houses shown were moved off the island before 1912, and are visible in a c. 1885 photo (Leiby 1969:68). A map from the 1912 G.W. Bromley Atlas of Bergen County shows their new location to the south of the island.

The original 11 acre site afforded a dependable water supply and, being close to the railroad line, was easily assessible for materials, equipment, coal and supplies for construction and continued operations of the plant. Leiby reports, "Fifty men were soon at work at New Milford, where 'the walls of the building are being run up by a dozen bricklayers and concrete foundations laid for the building of the pumping engines." A chimney 135 feet high was under construction on a foundation nine feet thick, as well as a circular settling basin 110 feet in diameter in front of the building and a forty-eight inch circular brick conduit to a large pump well. These works appear to have cost $537,500.... Mr. D. W. Chase was hired as superintendent of the New Milford plant at $125 a month, house rent and fuel, and on November 1, 1882, Hackensack water began flowing to Hoboken" (Leiby 1969:69).

West Hoboken was connected in 1883, as well as Weehawken where the Water Company's office moved to from Hoboken. The Weehawken Water Tower, in which the offices were located, was six stories high and held a tank of 150,000 gallons weighing 600 tons. The Tower was designed as a copy of the Palazzo Vecchio in Florence and soon became a local landmark (Leiby 1969:70).

It appears that the Hoboken engineering firm of Spielman and Brush were contracted for the New Milford plant project, providing the company with engineering and architectural design services. Charles Benjamin Brush, partner and principal design engineer for the Water Company project, attended New York University and became an instructor there in 1874. He was appointed Dean of the University's School of Engineering in 1895. His residence until his death was in New York City, and was a member of the American Society of Civil Engineers. He formed a partnership with Arthur Spielman at Hoboken in 1869. The firm of Spielman and Brush had a number of clients in Hudson and Bergen Counties, and provided extensive services for the Hoboken Land and Improvement Company, an organization that directed the development of that city during the 19th and early 20th centuries, under the guidance of Colonel John Stevens and his descendants. Arthur Spielman died in 1883, and the firm's name became Charles B. Brush and Company. A full-page ad in the *Jersey City and Hoboken Directory* notes that the firm produced fire insurance maps, surveys, and designs for roads, waterworks and drainage. The firm's address was 13 Newark Street, Hoboken.

SIGNIFICANCE (CONTINUED):

Brush worked for the Hackensack Water Company as its chief engineer from the early 1880's until his death in 1897. The New Milford plant appears to have been his first project for the company. The first pumphouse, completed in 1882, may have been his design (Leiby 1969:88). No drawings, notes or contracts for the building have as yet been found.

The building's design is in the Industrial Romanesque Revival style, popular during the last half of the 19th century. It is characterized by monochromatic brick walls, arched wall openings (doors and windows), with articulated horizontal lines and panels and pavilions on exterior walls. The pumphouse design has an industrial context - a massing reflective of the building's function, with limited ornamentation on the exterior walls. The cavernous interior spaces allowed for large, bulky machinery, and the overhead roof monitors provided daylight and ventilation. As the water pumping capacity needed to increase, the equipment became larger; therefore, the interior spaces also needed to be larger. This pattern can be easily seen in the evolution and growth of the facility. The original water treatment process was not filtered in the modern sense, and depended upon the purity of the supply water and the settlement basin (see photo of "First Pumping Station and Circular Basin, c. 1885, Leiby 1969:68) to substantially reduce solids and impurities.

In 1886, as part of a second transmission main from its plant in New Milford to Hoboken, Englewood was able to be added to the system. Expansion of the distribution system, in conjunction with additional capacity of the plant, led to the servicing of developed areas of Bergen County and parts of Hudson County.

Great advances in the field of public water supply were made in the last years of the nineteenth century. American waterworks engineers had also been doing some experimentation in the use of filters. Real research in America did not begin until about 1887, when Allen Hazen built and operated an experimental filter at Lawrence Experiment Station in Massachusetts. Although originally conceived to clear the color and take out the organic materials which caused odors,sand filters proved to be even more useful in reducing the number of water-borne bacteria in water.

Sand filters had been used for many years by more advanced countries in Europe; however, only two such systems were in operation for communities of comparable size: Poughkeepsie, N.Y. built in 1872, and Albany, N.Y. built in 1899. Except for the south and west, where muddy river waters had to be cleared, very few water supplies were being filtered at the turn of the century (Leiby: 95-96). Leiby states, "To this day (sic 1969) the New York City, Jersey City, Wanaque Reservoir and Newark supplies (to mention only four out of hundreds) are not filtered.

On October 26, 1899, doubtless feeling with some justification that it was in the forefront of progress, the Hackensack Water Company hired Mr. Hazen to see "what results could be accomplished by the different methods of filtration." He was a proponent of the so-called "slow

SIGNIFICANCE (CONTINUED):

sand filters", in which the water was allowed to percolate slowly down through a huge bed of sand, perhaps at a rate of 1-1/2 or 2 million gallons a day (MGP) per acre. At Louisville, Kentucky, another engineer, George W. Fuller, was experimenting with a rapid sand filter, in which the rate of flow was expected to be increased fifty-fold or more by pretreatment of the water with coagulants. This system was based upon the principle of the patented "tub filters", the patents on which had recently expired, but the Louisville plant would be the first to use large conctrete filters like those of the Hackensack Water Company.

Meanwhile, the Company determined to go ahead with a new reservoir at Oradell, and purchased the old Veldran mill site, a half mile or so north of the New Milford plant, paying a reported one million dollars in 1901 for large amounts of land north of the mill. The reservoir was a necessity to meet the volume of water required by expansion of the service area. Along with the reservoir, the Company authorized an enlargement of the pumping station at New Milford, with a new 110 foot chimney, new steam boilers giving the plant a capacity of 1000 horsepower and a pumping capacity of 12,000,000 gallons per day. The old Van Buskirk mill on the site had been torn down in 1899 to make room for the enlarged plant.

The reservoir would perform two functions. First, of course, it would store water against periods of drought. Second, it was expected that by giving the water time to settle, it would eliminate much of the sediment which the stream picked up in its course through the low wooded and marshy land which ran for some miles north of Oradell. The filtered systems in New England depended heavily on large reservoirs back of the filter beds. The Company may or may not have known that the storage would eliminate a good part of any harmful bacteria that found their way into the stream, since most of such bacteria have a short life in clear water. If, as seems to have been the case, the work on the new reservoir in the spring of 1902 produced the discoloring that started a flood of complaints about the water supply and its purity, there may have been those who wished the Company had let the poor bacteria live (Leiby 1969:102-103).

In authorizing the reservoir and enlarged pumping station, the Company took no action to authorize a filter plant. Since a reservoir was required before any filter system could be built, the officers probably considered that the recent experiments in the art of rapid sand filtration made it wise to wait and see whether Mr. Hazen's slow sand filters or the new "American" rapid sand filters of George W. Fuller were better. (Leiby 1969:103-104) A decision was, undoubtedly, forced in 1902 when great general concern was raised about water purity. In November, 1902, at the height of the debate, the Company switched from the Hazen engineering firm, the leading proponent of slow sand filters, to the George W. Fuller firm. Messrs. Hering and Fuller had just built the plant in Louisville with a rapid sand filter system, which required only two acres of filter bed to do a better job than one hundred and twenty-five acres would do in the Hazen system. The key to the new system was the use of coagulating basins in front of the filters, an

SIGNIFICANCE (CONTINUED):

expensive but highly efficient arrangement. On May 4, 1903, the Board of Directors approved the construction of a new filter plant using the Fuller system (Leiby 1969:110-111).

During the summer of 1903, the Water Company announced plans to build a large reservoir on Pascack Creek at "Woodcliff" (sic: Woodcliff Lake), five miles above the intake at New Milford.

This reservoir had been planned for some time, but its need was hastened by a severe drought in 1903. Work on the filtration plant at New Milford had continued while Woodcliff Lake was under construction. By the end of 1904, the filters were filled with about fifty carloads of specially-graded sand from Sea Girt, "together with considerable charcoal and crushed stone, through which purifying process the water will pass....", as reported in the *Record,* the local county newspaper. On January 20, 1905, seventy-five engineers attending the annual convention of the American Society of Civil Engineers at New York went to New Milford by special train to visit the plant. The *Record* reported, "It is something out of the ordinary, many novel features being introduced. There is only one other anywhere near like it and that is at Little Falls in Passaic County...." (Leiby 1969:115/131).

On June 25, 1906, the "new" (sic) filter plant was formally opened before a large gathering at which Dr. Ernest J. Lederle made an address in which he highly praised the new plant. The papers reported that "The filtration plant was inspected with great interest by those present, and a fine luncheon was served." Standard texts on water supply engineering now refer to the New Milford filter plant, along with Louisville, Kentucky, and Little Falls, New Jersey, as one of the great pioneering plants in the field, one of the plants which laid the groundwork for most of the later filter plants in the nation (Leiby 1969:134).

In 1911, the Water Company was pumping out an average of twenty-five million gallons of water per day, and it was becoming obvious that steps would have to be taken to (again) increase the capacity of the system, both by enlarging the pumping station and filter plant and by increasing the storage capacity of the Oradell Reservoir. In 1911, the Company started to work on both projects, with Myles Tierney and his son John C. Tierney as general contractors. As part of this expansion, the Allis Chalmers "Vertical High Service Pumps" , now known as Pump No. 7, were installed in the "new" pumphouse. Also as part of this expansion, the filtration plant was enlarged.

Except for the c. 1955 expansion of the filtration plant, the significant physical and architectural configuration of the New Milford plant was subastantially fixed by 1912, and has remained little changed since. The plant became physically limited by its island location; however, treatment improvements and larger capacity pumps allowed the plant to remain in use until recently. Significant changes would take place in the treatment process.

SIGNIFICANCE (CONTINUED):

According to Leiby, water quality was a never ending concern of the community at large, and pressure on the Water Company was constant. As technology was advancing in general, research into improving water quality was an on-going requirement, often spurred on by prodding from health officials. In 1913, concern was raised over the safety of the addition of alum, as a coagulant, to the water supply. The Company's recently appointed Chief Chemist, George R. Spaulding, who had worked for a time for the East Jersey Water Company at Little Falls, took on the challenge of the attack. Spaulding, in his successful defense, stated that 600 plants in the United States used rapid sand filters with alum coagulators, while only twenty of the old slow sand filters without coagulators were still operating. As the result of his perseverance and expertise, "The alum scare was dead as a doornail" (Leiby 1969:149).

A most important technical development in water purification is attributed to the Hackensack Water Company, but more specifically to George Spaulding. In the latter years of the 1920's, Spaulding conceived an idea for the use of activated carbon in water treatment. This substance had long been recognized as an efficient means of removing tastes and odors in other applications. He experimented with the then radical idea of applying the activated carbon in a finely powdered form, prior to coagulation, rather than in the filter beds', which was unsuccessful. The results were encouraging and they were reported in a paper presented at the New York meeting of the American Water Works Association on May 2, 1929. Spaulding's experiments found that even small quantities applied by this method would greatly improve taste and odors and that none of the carbon would pass into the system, almost all of the particles being removed in coagulation and the balance being trapped in the filters. A month-long experiment with the whole water system was made in March, 1930, at the New Milford plant. In March, 1931, the Company decided to use the process on a continuous basis. It is now standard in water systems throughout the world. Mr. Spaulding modestly described his process as "nothing but a simple and surprisingly effective method" of applying activated carbon. In fact, it was his discovery that made activated carbon useful in providing pure and palatable water, a discovery so highly regarded by the waterworks industry that he was later given the George W. Fuller Memorial Award of the American Water Works Association (Leiby 1969:174-176). All of Spaulding's experiments were conducted at the New Milford plant, in the Laboratory located in the c.1904-1906 Purification Plant at the south end of the Filtration Plant.

From the 1930's to the 1950's, the plant was gradually converted from coal to oil fuel. Electric pumps were installed and the plant partially converted to electric power in the late 1950's, although the early boilers are still intact. An addition was built c. 1934 on the east side of the filtration building. This included garages, storage, service and machinery shops. In 1955, six filter sections were added to the filtration building's north end.

DeForest Reservoir, in Rockland County, N.Y., was added to the Hackensack system in 1957.

SIGNIFICANCE (CONTINUED):

By 1960, the Company saw the need to enlarge the New Milford plant, but its island location limited further expansion. The Company built a new plant in Haworth, Bergen County, north of the New Milford plant. In 1964, the Company built a pumping station and filtration plant at DeForest Lake. In 1967, Lake Tappan in Rivervale, Bergen County, was added to the system of reservoirs. Because the New Milford plant is located in a flood plain, along a tidal section of the Hackensack River, there were many floods at the site, through the years. As a result, metal flood doors were installed at all of the plant building's exterior doorways in the late 1960's.

The New Milford plant operations were shut down in 1990, after service had been gradually phased out and replaced by the Company's plant in Haworth.

N.B. Much of the historical information herein is based upon Adrian C. Leiby's book, The Hackensack Water Company 1869-1969, published in 1969 by the Bergen County Historical Society. Mr. Leiby is recognized as an authority in the early history of New Jersey; however, of even more particular relevance is his more than thirty year's affiliation with the Company, for which he served as a director and officer. Mr. Leiby's book on the Company contains a very detailed account of its historical origins and development, including many interesting anecdotes, which might otherwise have been lost, and affords a window into the history of the Company, and the area which it has served.

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"Press Release", Announcing offer to donate New Milford Plant to Bergen County. 1991
"Fact Sheet", with reference to New Milford Plant and Grounds. 1991
"Historical Highlights-New Milford Plant and Grounds". 1991
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GEOGRAPHICAL DATA:

VERBAL BOUNDARY DESCRIPTION:

Lot 1, Block 123
Tax Map - July 1985
Borough of Oradell, Bergen County, New Jersey

BOUNDARY JUSTIFICATION:

The nominated property includes the entire parcel of the historic Van Buskirk Island, on which are located all of the buildings, structures and objects historically associated with the New Milford Plant of the Hackensack Water Company.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number _____ Page _____

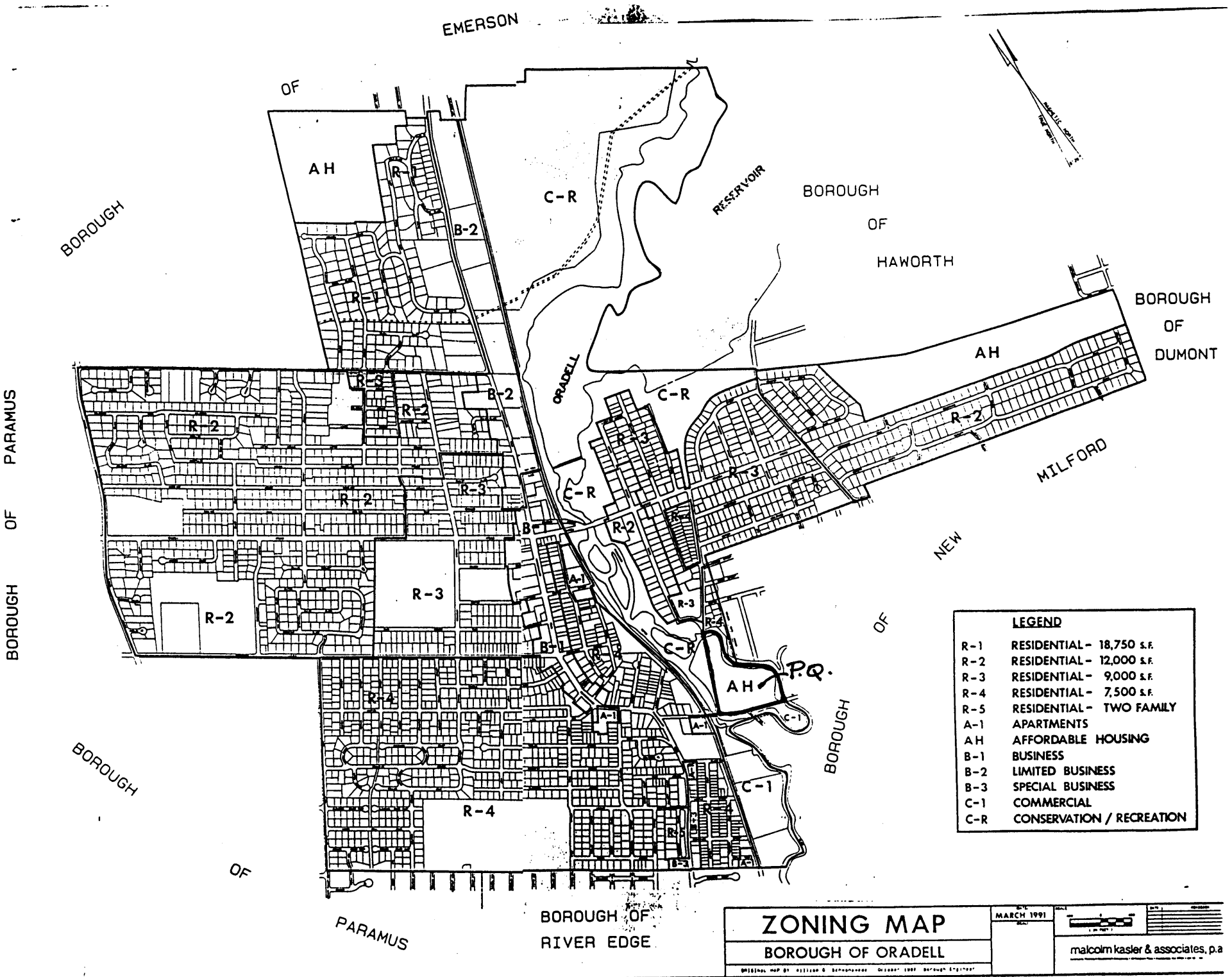
PHOTOGRAPH IDENTIFICATION SHEET NO. 1:

New Milford Plant of the Hackensack Water Company
New Milford Avenue
Oradell, Bergen County, New Jersey

Photo No.	View	View From
1	Pump House and Filtration Plant west side	W
2	Filtration Plant south and west sides	SW
3	Pump House north and west sides	NW
4	Pump House west side	SW
5	Pump House south and east sides	SW
6	Pump House south and west sides	SW
7	Pump House south side	S
8	Pump House south side - roof details	S
9	Pump House south and east sides	SE
10	Pump House east side - south end	E
11	Pump House east side	SE
12	Pump House east side	E
13	Courtyard between Pump House & Filtration Plant	SE
14	Courtyard between Pump House & Filtration Plant	E
15	Courtyard between Pump House & Filtration Plant	NE
16	Filtration Plant	SE
17	Filtration Plant	NE
18	Filtration Plant - north end	E
19	Pump House - Section 1F - east side roof dormer detail	SE
20	Sedimentation Basin - center section	W
21	Pump No. 3 - Section 1B	SW
22	Pump No. 7 - Section 1G	N
23	Piping in recess to north of Pump No. 7	S
24	Piping in recess to north of Pump No. 7	E

Photos No. 1 through 24 inclusive, taken 01/26/97:

Photographer and negatives in possession of:
Chip Renner
25 West Oldis Avenue
Rochelle Park, Bergen County, New Jersey



ZONING MAP

BOROUGH OF ORADELL

MARCH 1991

malcolm kasler & asssociates, p.a

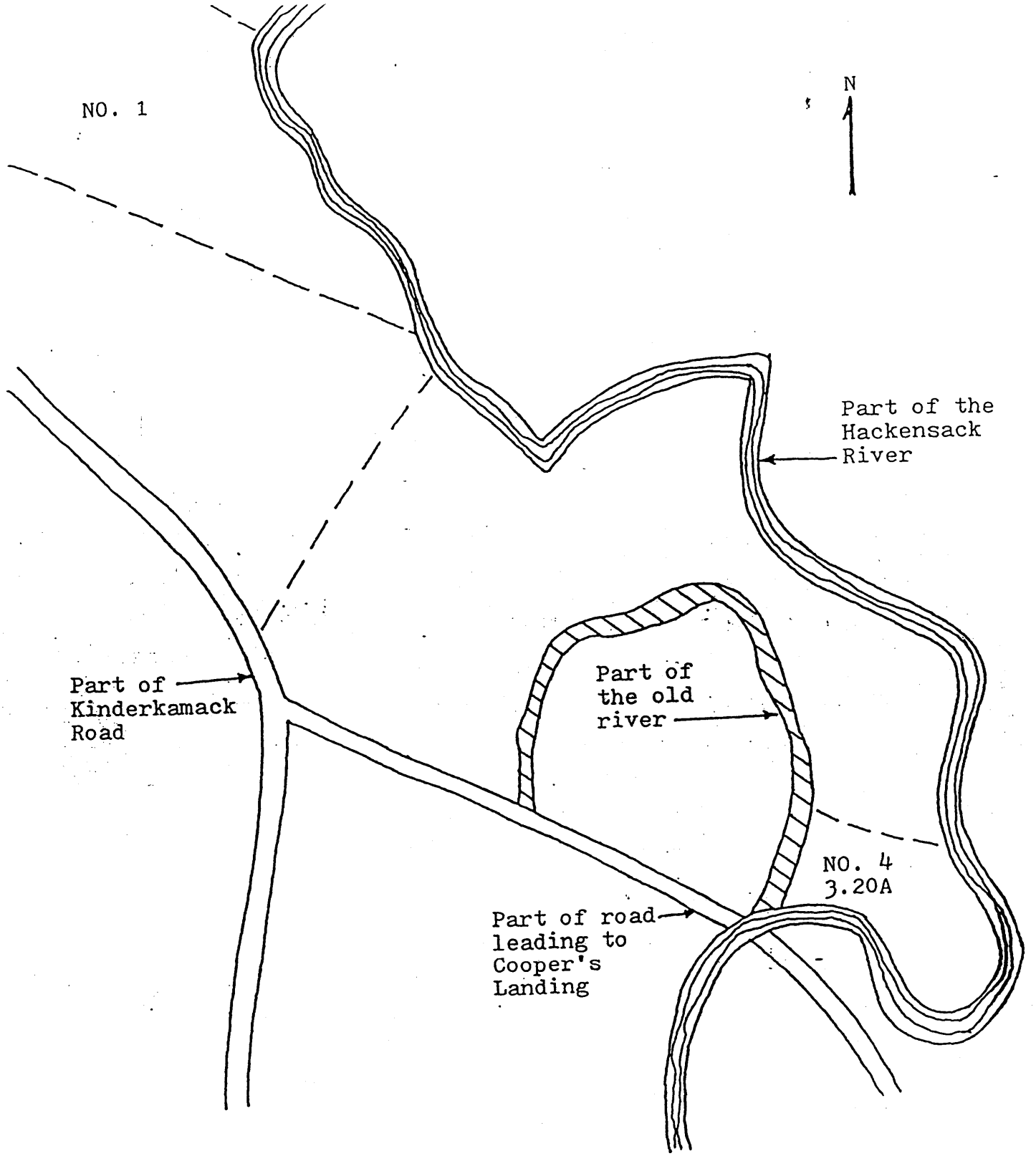
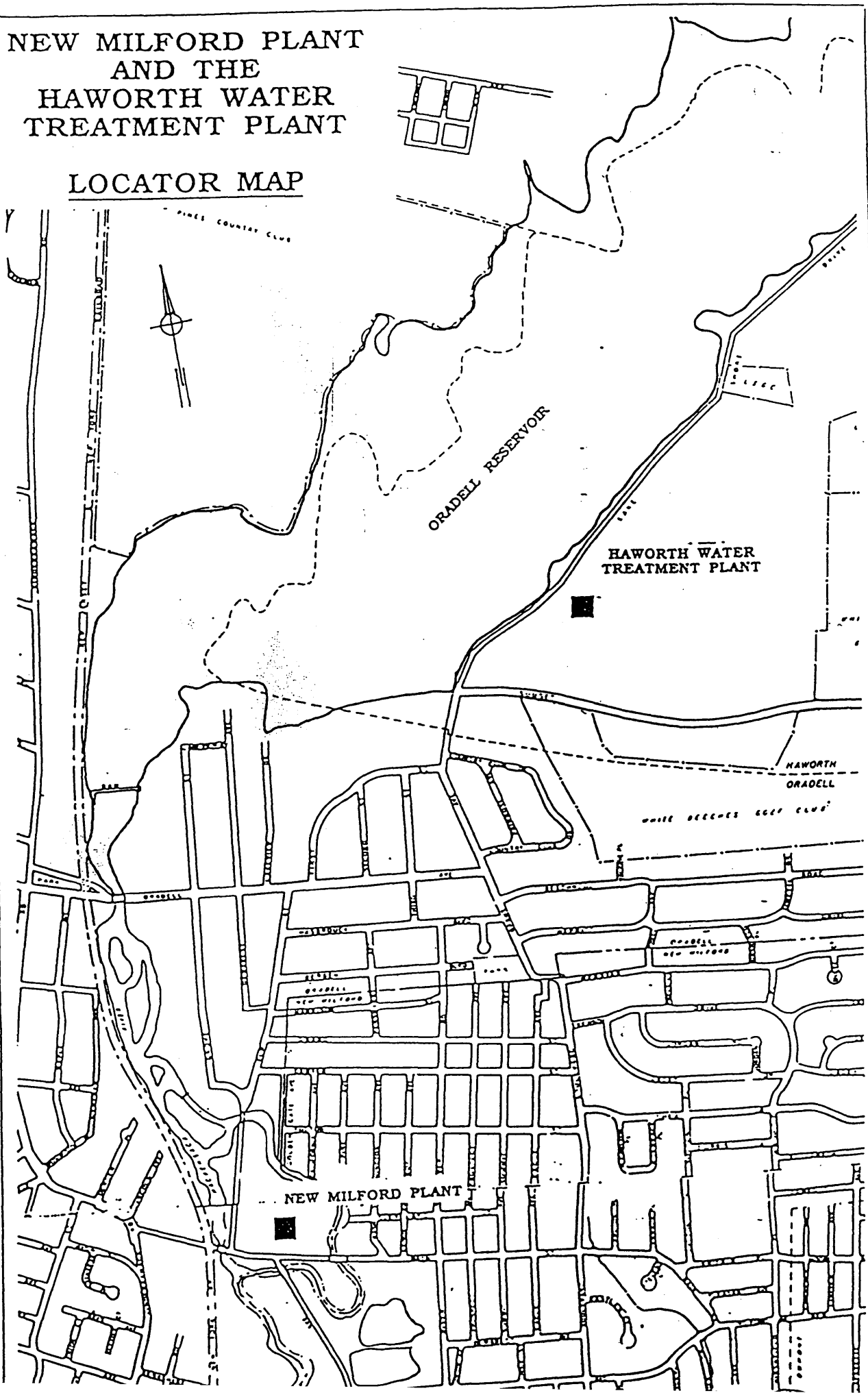


FIGURE 3: A portion of John Johnson's 1802 survey map of the property of the late Cornelius Cooper. Scale: 5 chains to the inch.

NEW MILFORD PLANT AND THE HAWORTH WATER TREATMENT PLANT

LOCATOR MAP



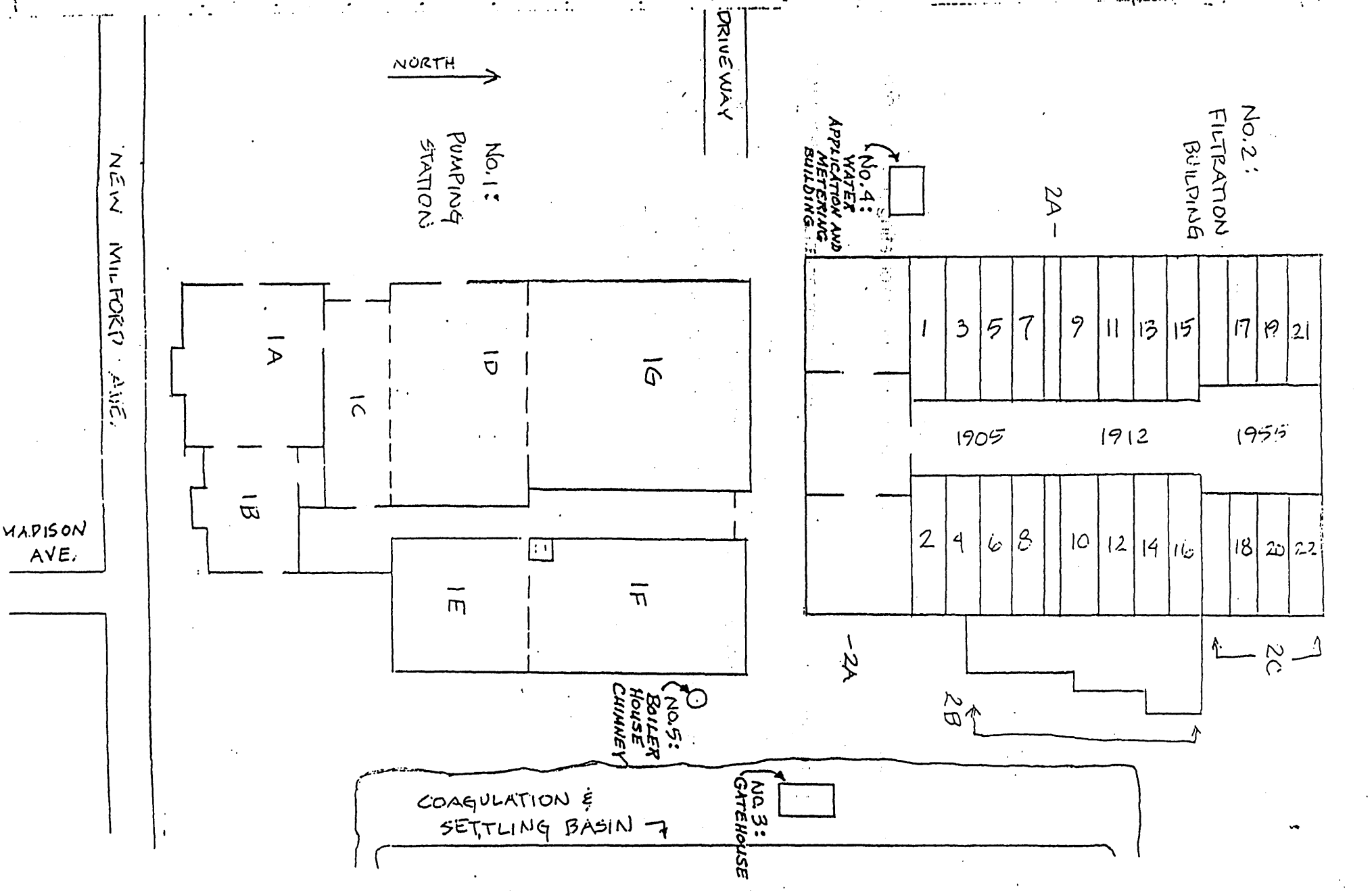


FIGURE 6: Hackensack Water Company New Milford Plant, Oradell, N.J. Site Plan for Historical Review and Evaluation. Not to scale. Locations are approximate. Most exterior fenestration and all interior walls are not detailed. August 1991. Elise Baranowski.

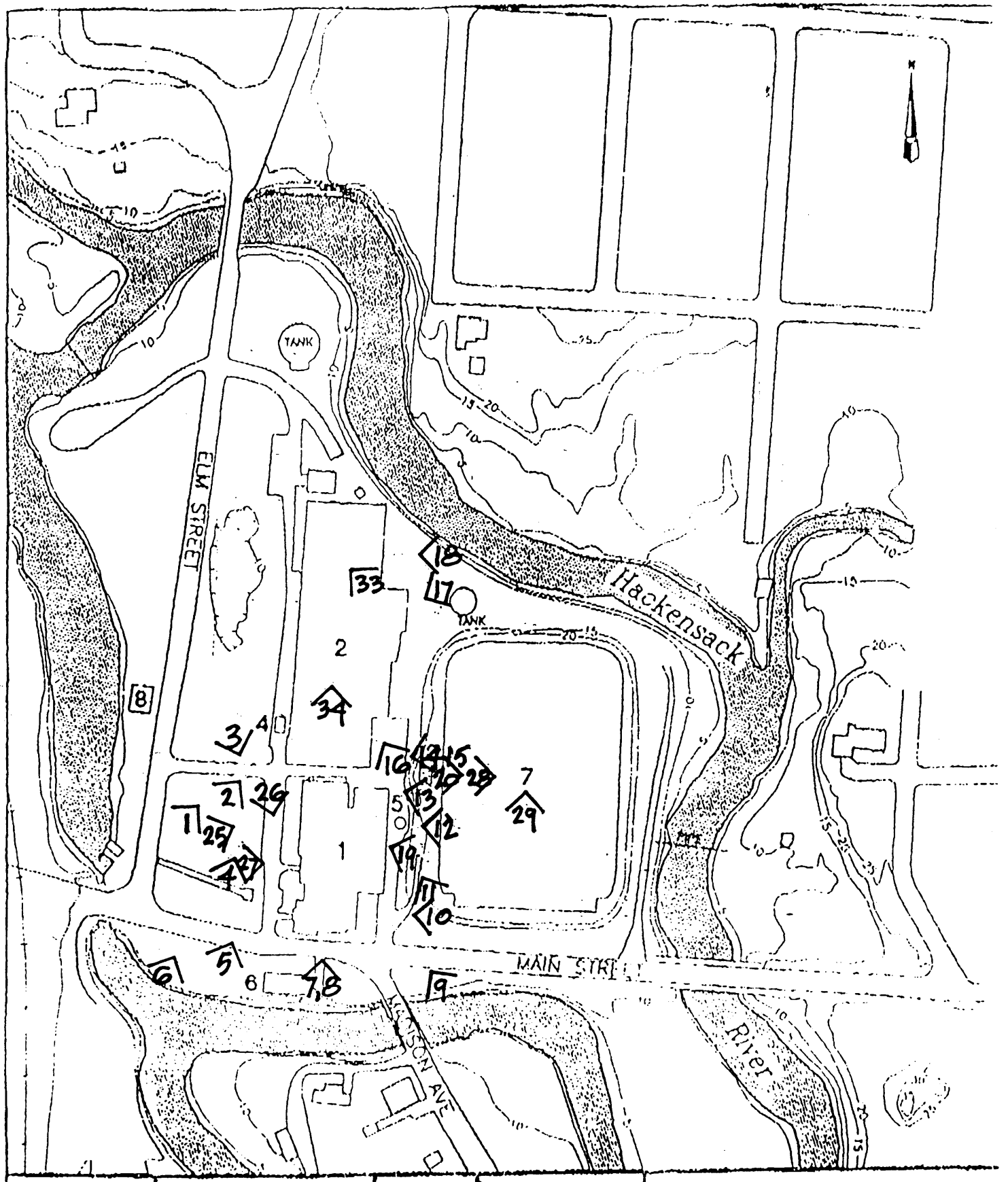


PHOTO LOCATOR PLAN 1.

1. PUMP HOUSE
2. FILTRATION BUILDING
3. GATEHOUSE
4. METERING BUILDING
5. BOILER HOUSE CHIMNEY
6. RAW WATER PUMP HOUSE
7. COAGULATION AND SEDIMENTATION BASIN
8. SUB STATION

0 100 200 400
FEET

New Milford Pump Station

Site Plan

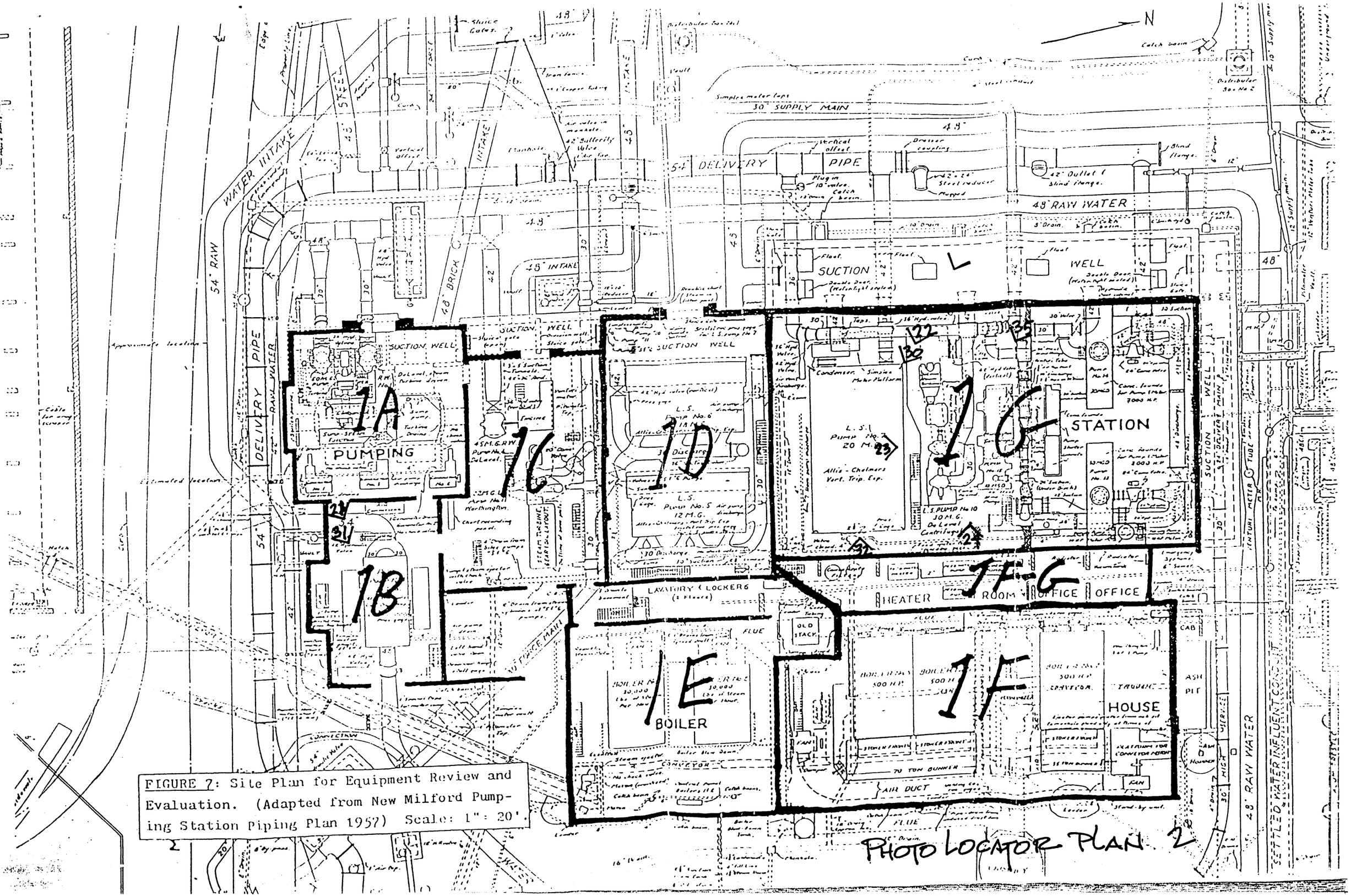
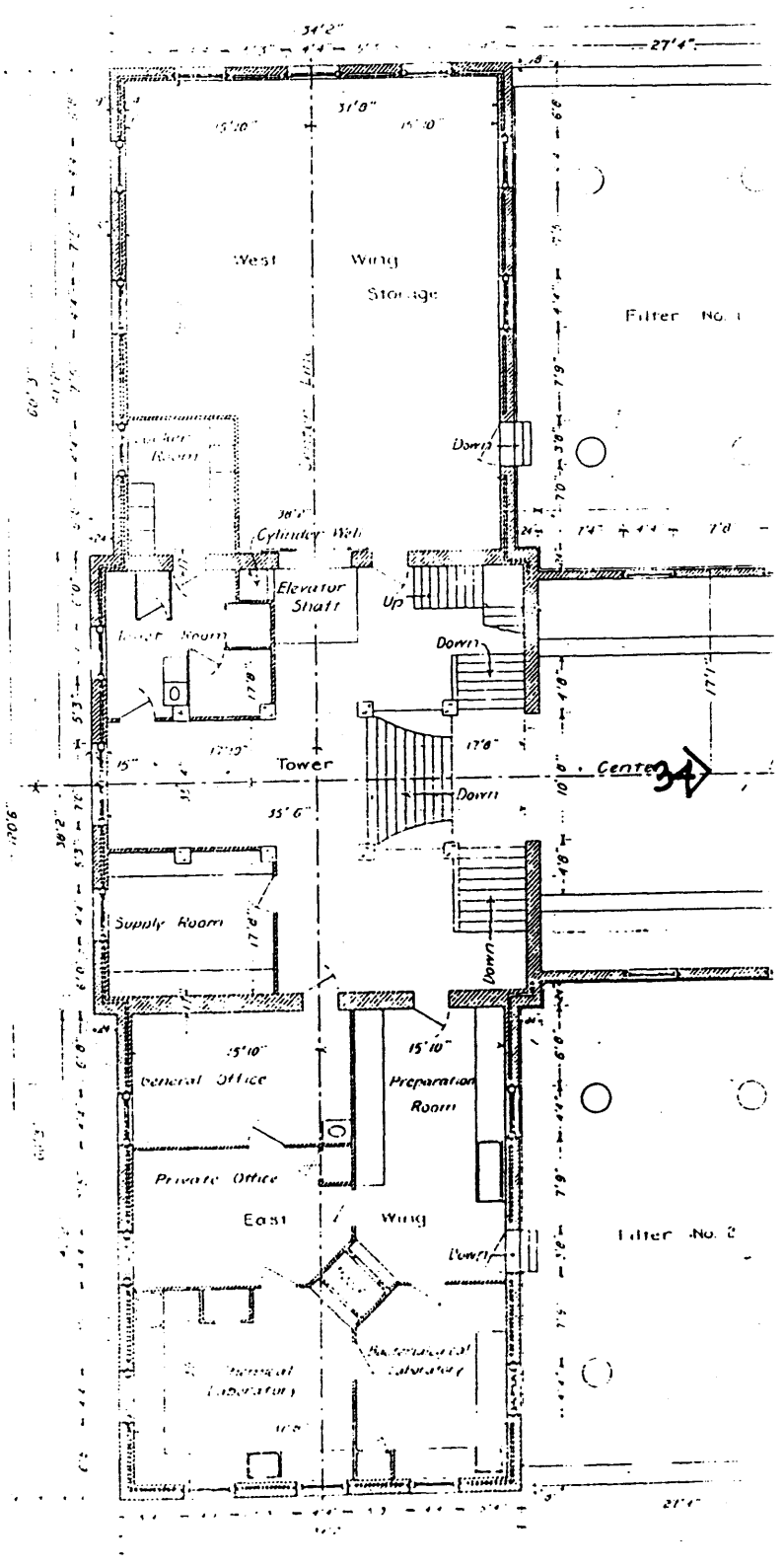


FIGURE 2: Site Plan for Equipment Review and Evaluation. (Adapted from New Milford Pumping Station Piping Plan 1957) Scale: 1" = 20'.



FLOOR PLAN - SECOND FLOOR

PURIFICATION PLANT - FILTRATION PLANT COMPLEX

PHOTO LOCATOR PLAN 3.

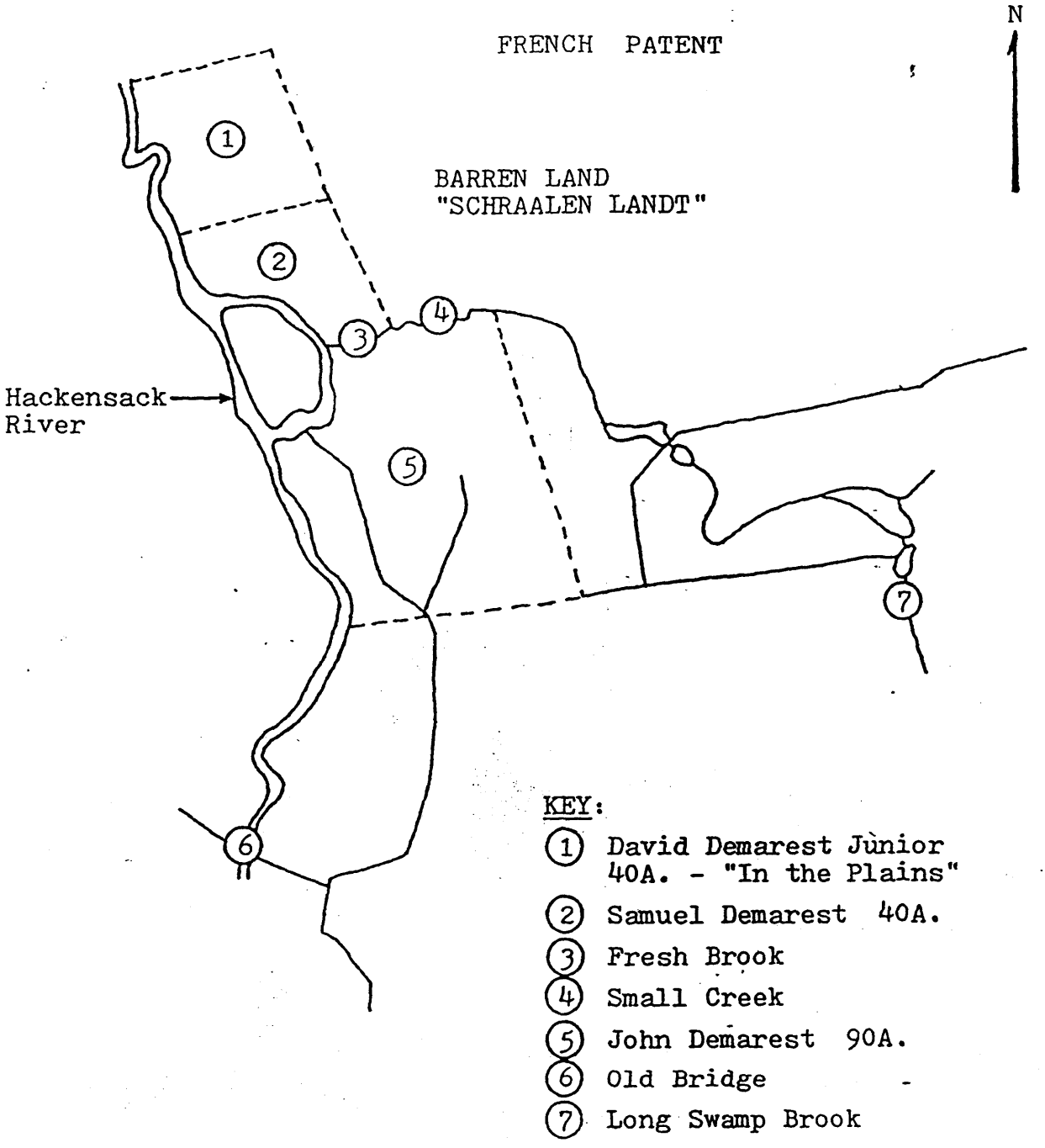


FIGURE 1: A sketch of the 1680 division of the 1677 French Patent. Land descriptions adapted to the 1876 Walker Atlas, Plates 80-81. Sketch by Kevin Wright, 1991. No scale.

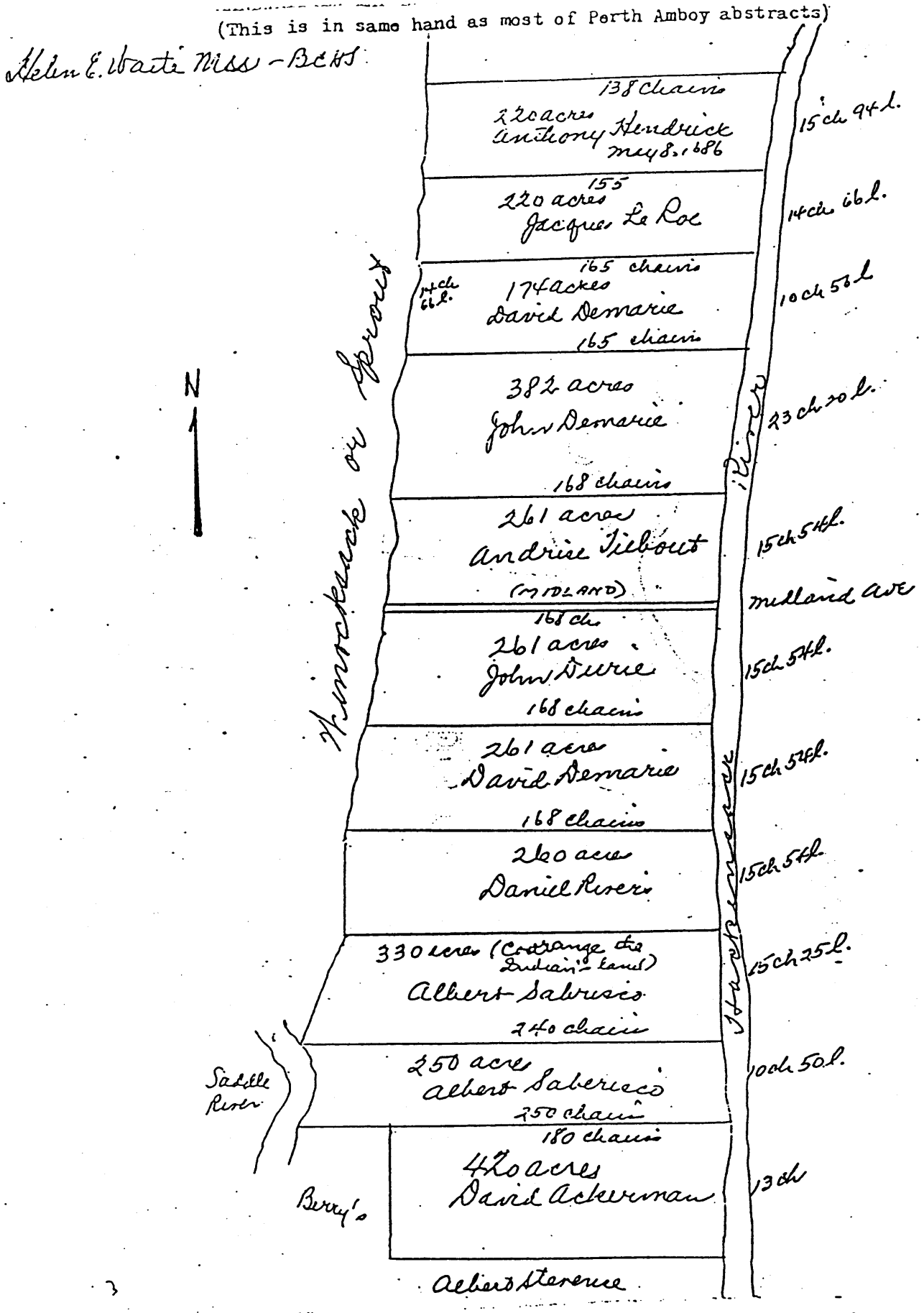


FIGURE 2: A map from the Helen E. Waite Collection depicting original patent holders along the west side of the Hackensack River. Author unknown. No scale.

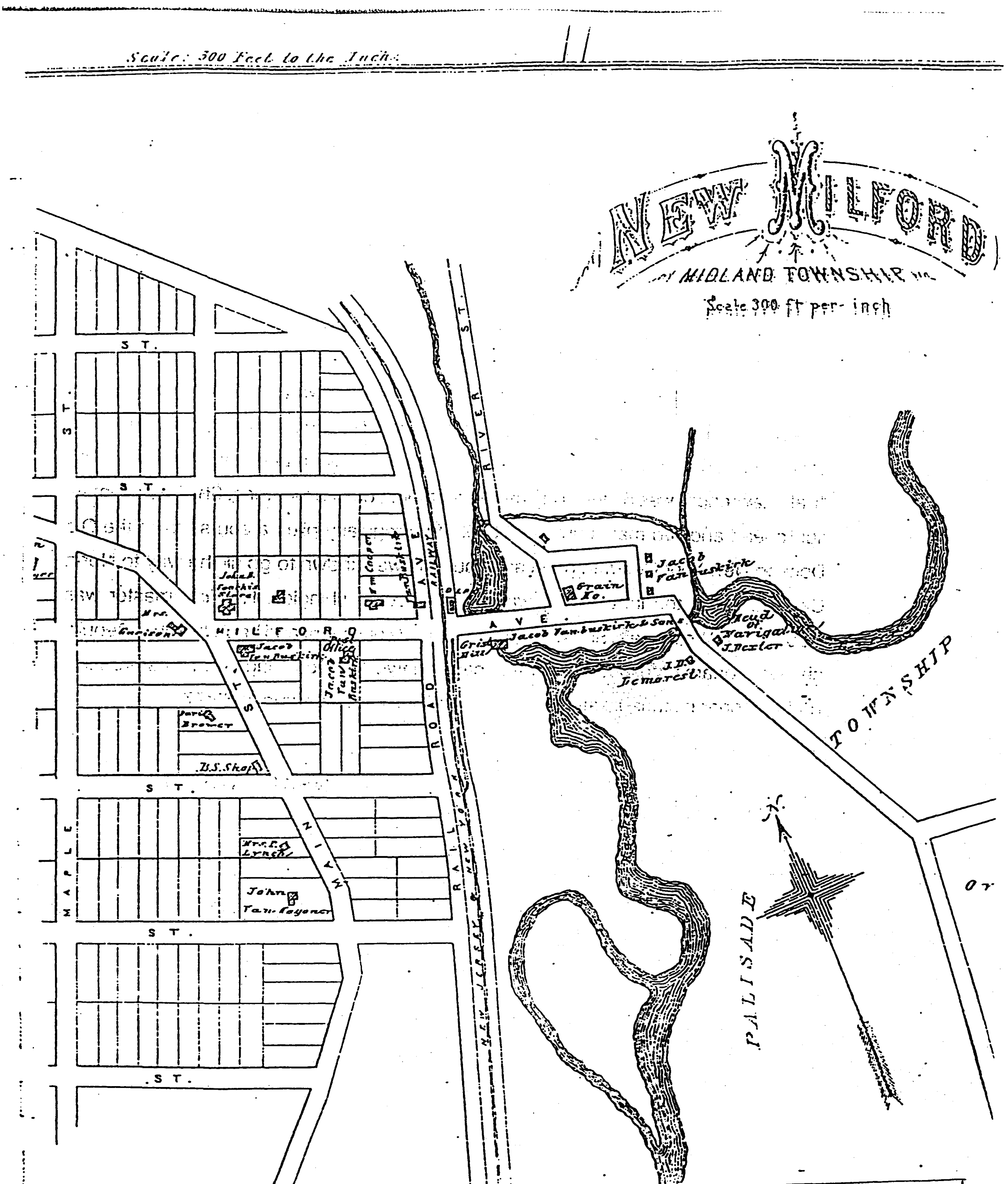
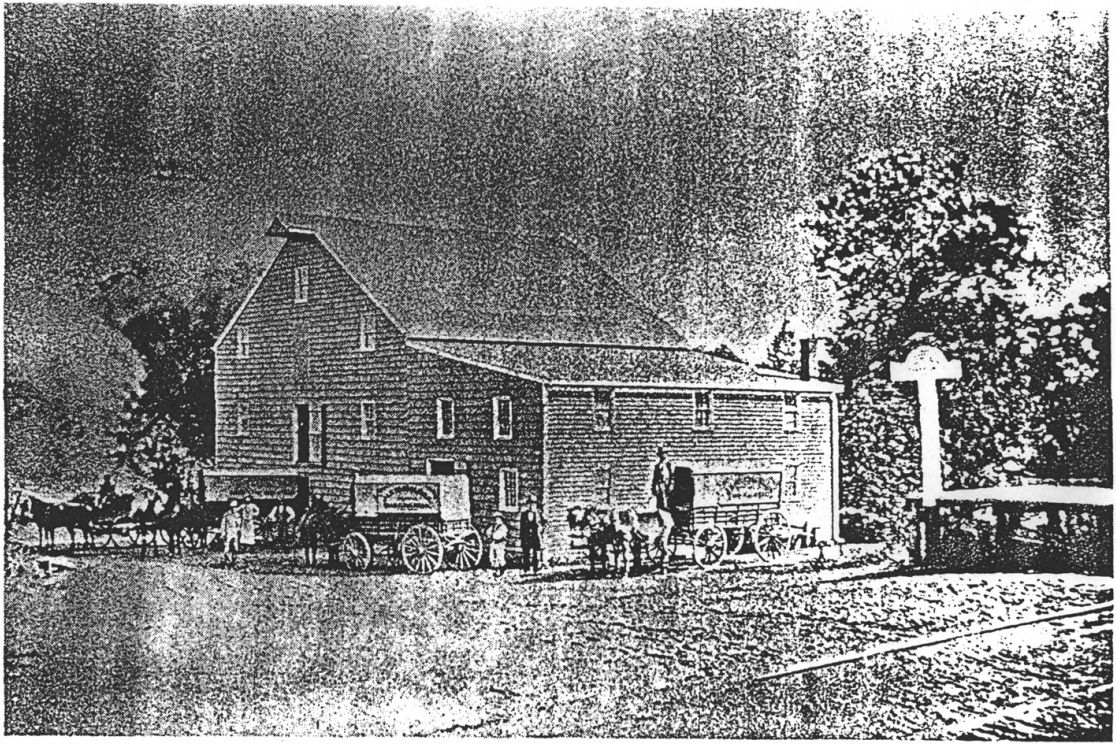
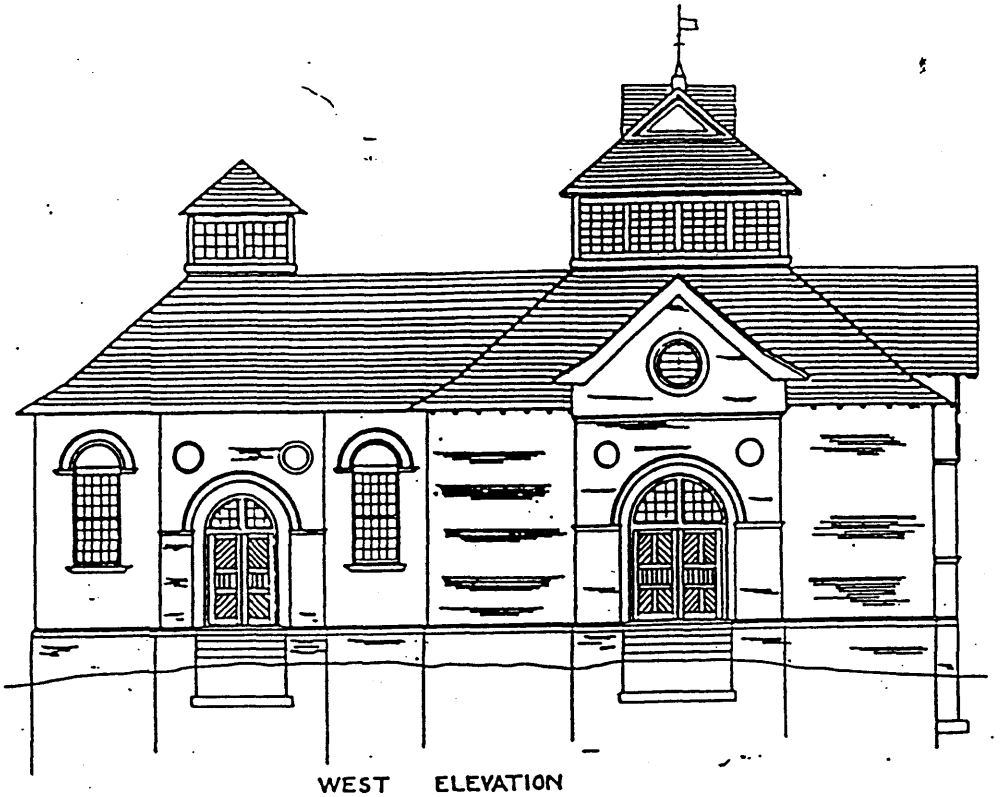


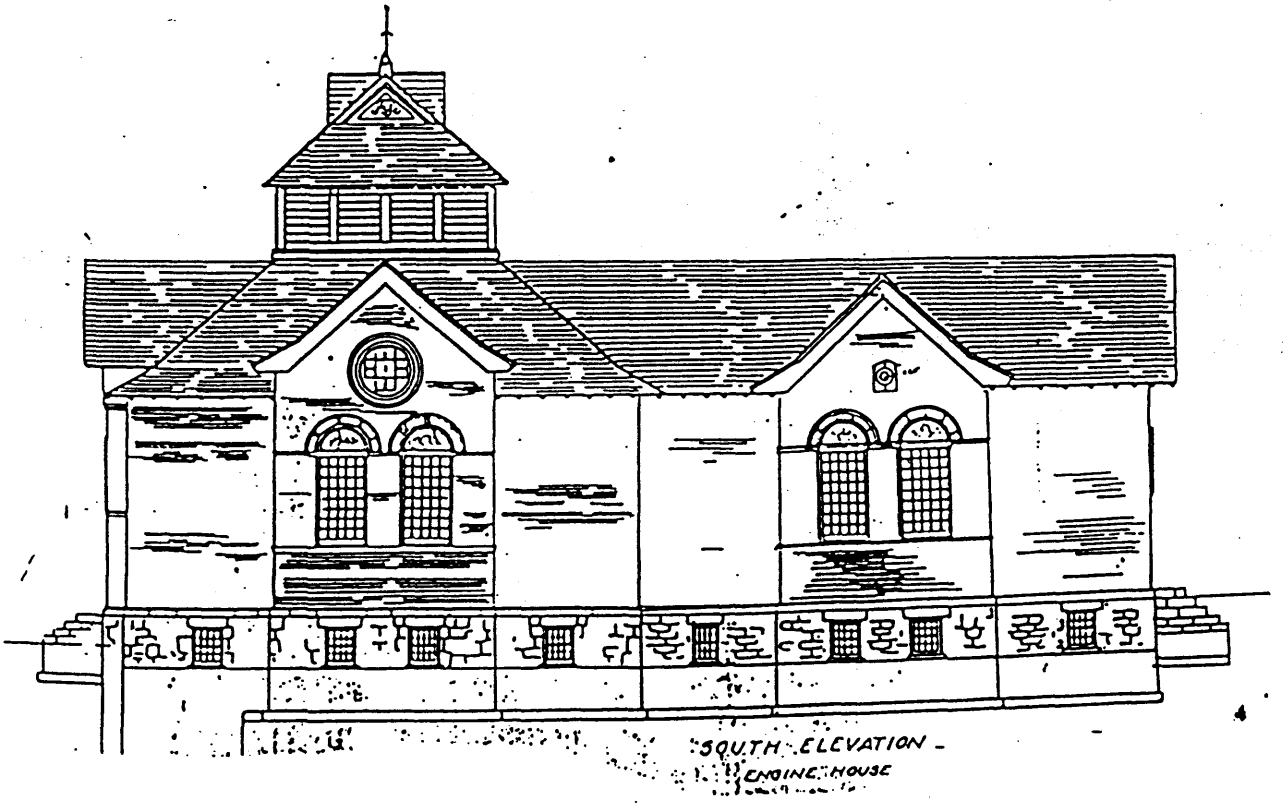
FIGURE 4: A portion of the New Milford, Midland Township from 1876 Atlas of Bergen County by A.W. Walker. Scale: 1"= 300'.



J. & H. Van Buskirk Mill, c. 1880

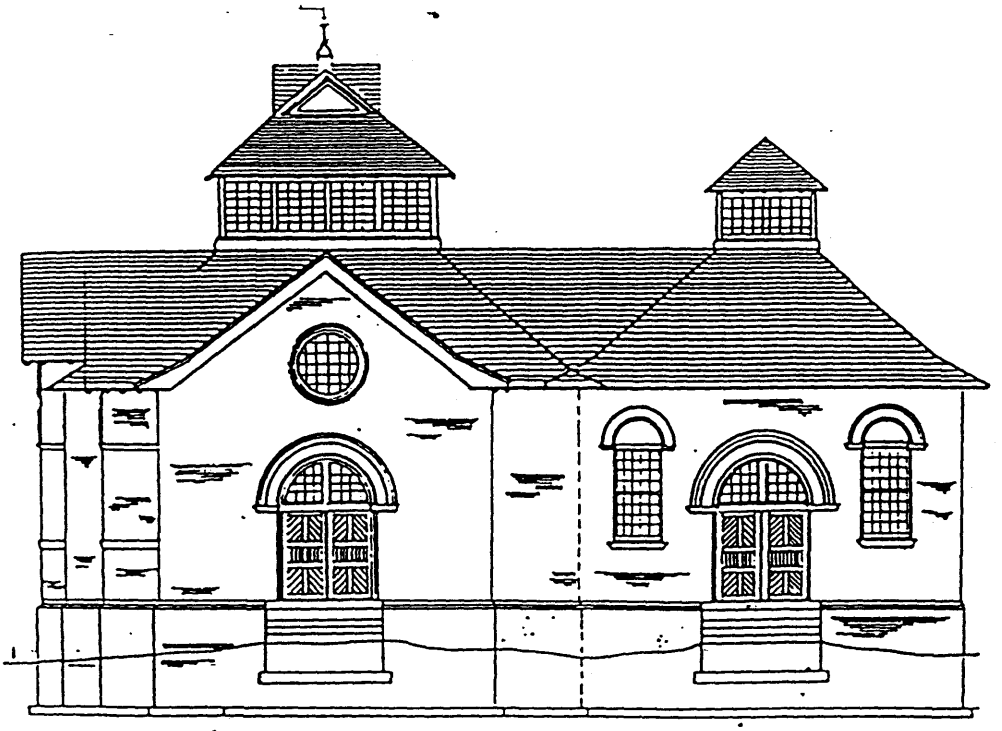


WEST ELEVATION

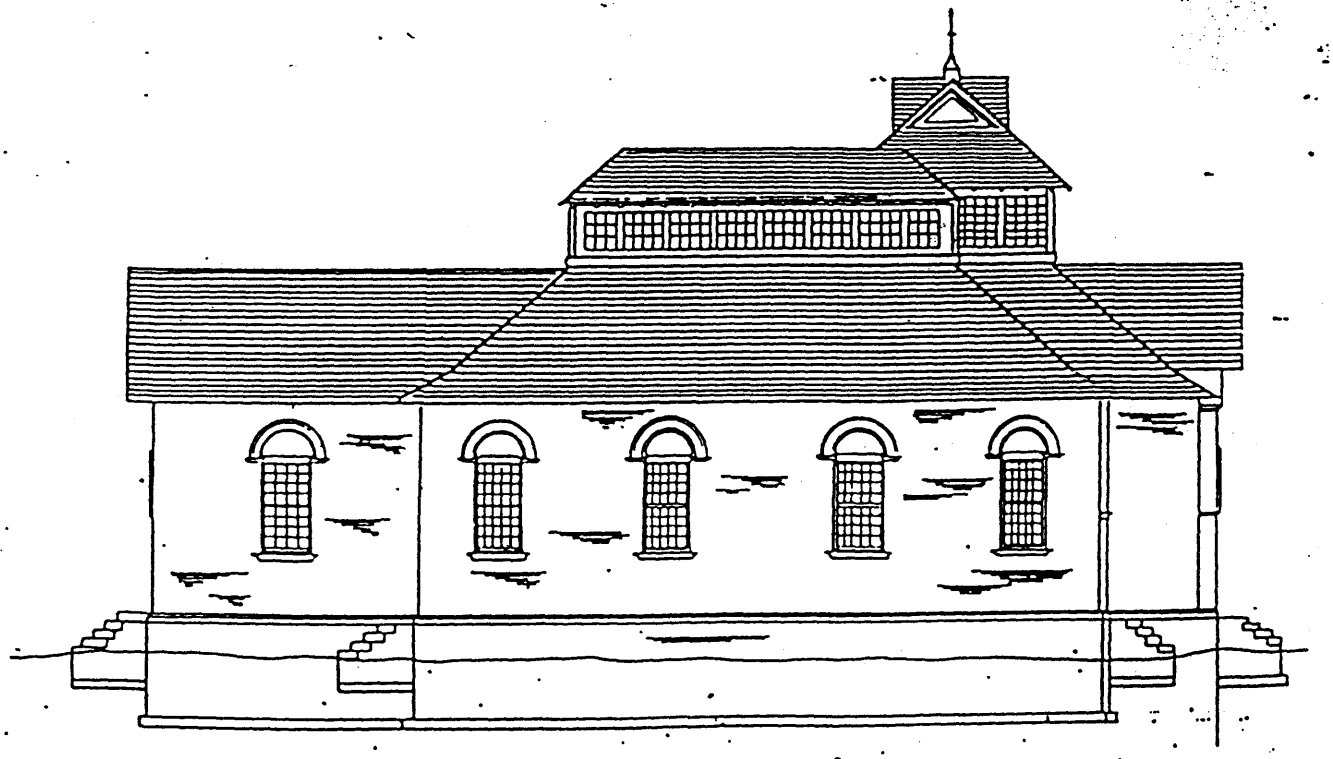


SOUTH ELEVATION - ENGINE HOUSE

ENGINE HOUSE ELEVATIONS

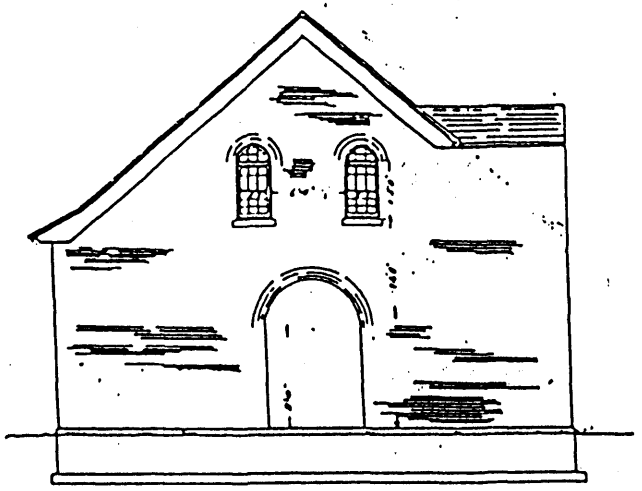


EAST ELEVATION

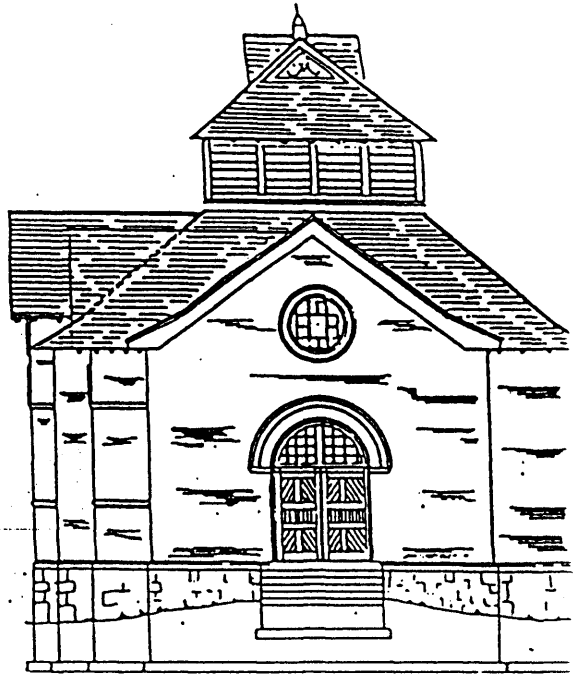


NORTH ELEVATION.

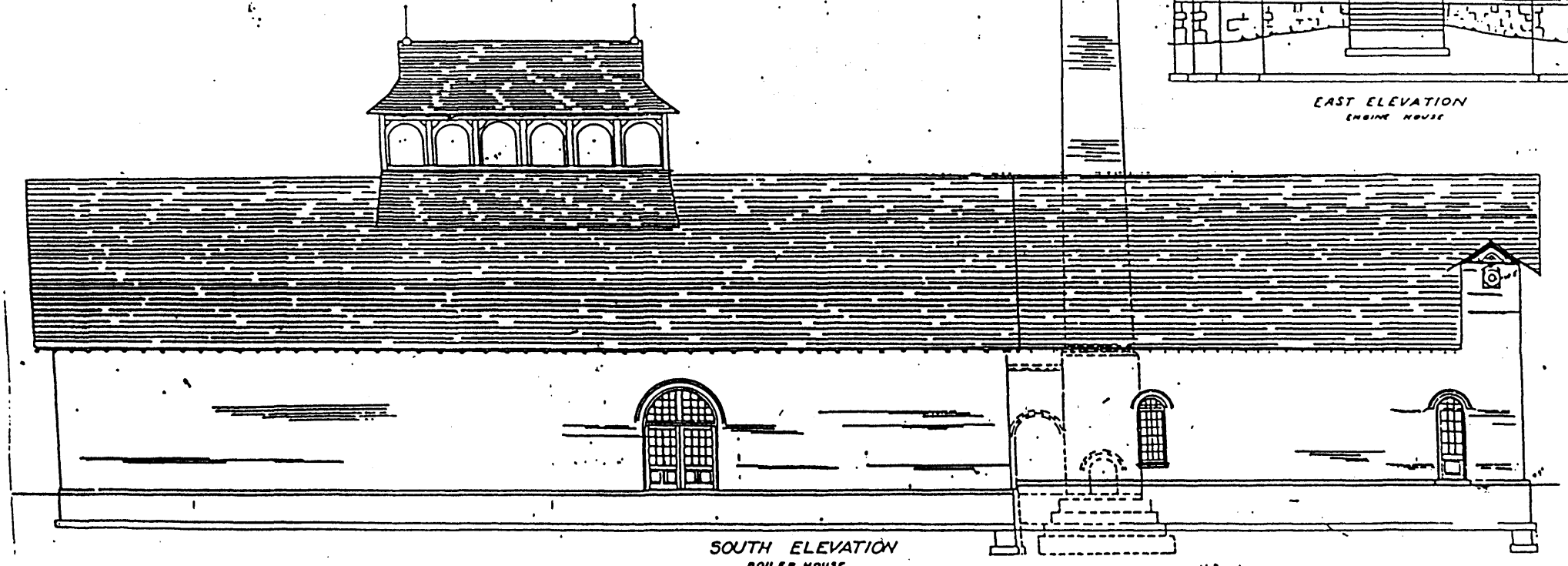
ENGINE_HOUSE ELEVATIONS



EAST ELEVATION
BOILER HOUSE



EAST ELEVATION
ENGINE HOUSE

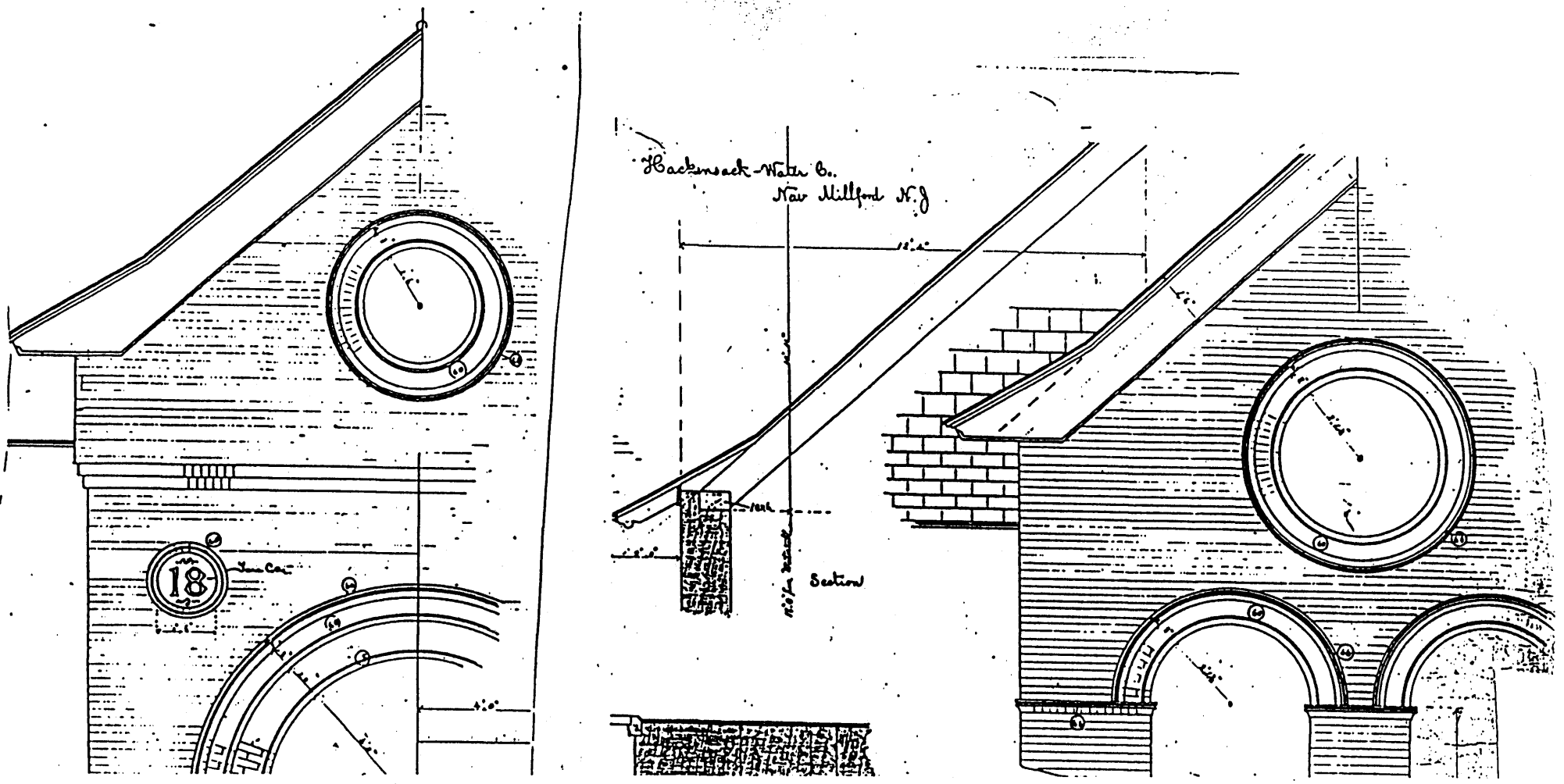


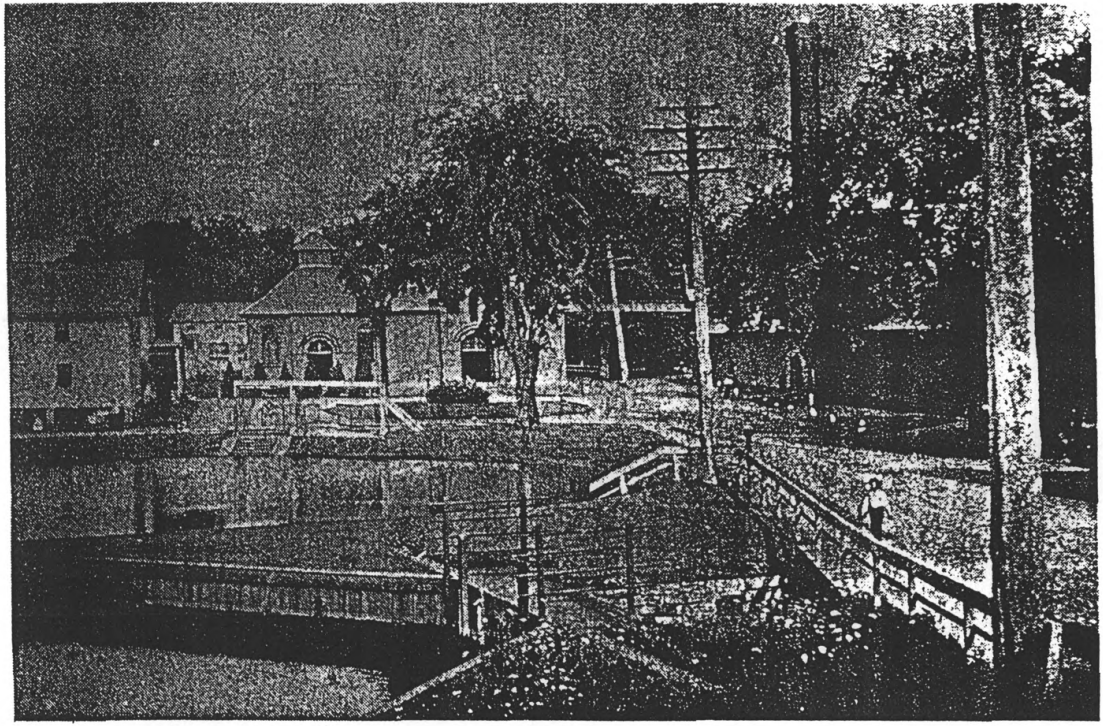
SOUTH ELEVATION
BOILER HOUSE

Scale 1/8" = 1'

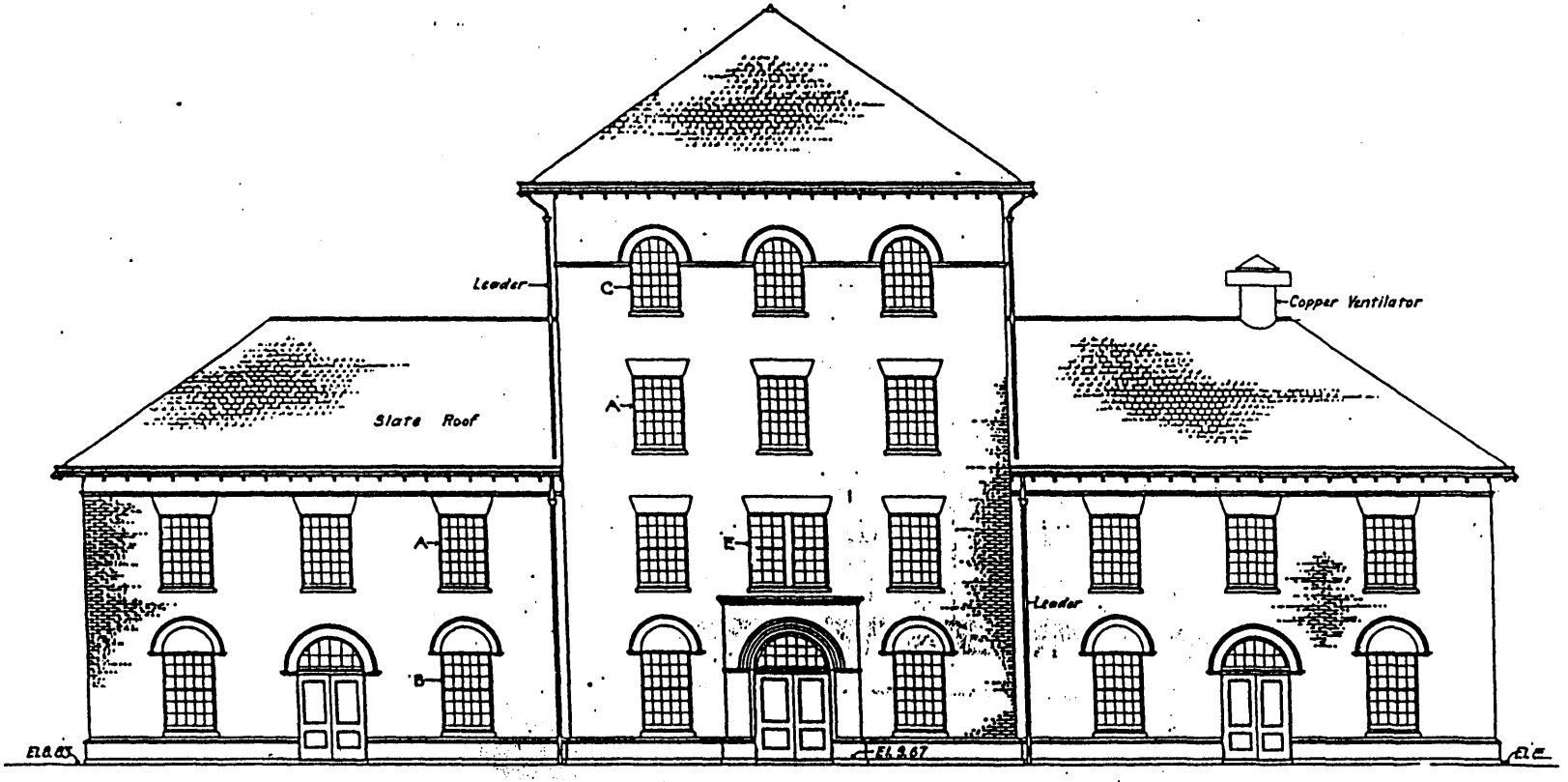
ADDITIONS TO
ENGINE & BOILER HOUSES
AT
NEW MILFORD N.J.
NOV 1896
SCALE 1 INCH = 8 FEET

ELEVATIONS OF ENGINE & BROILER HOUSES


Hackensack Water Co.
New Milford N.J.
18
Section



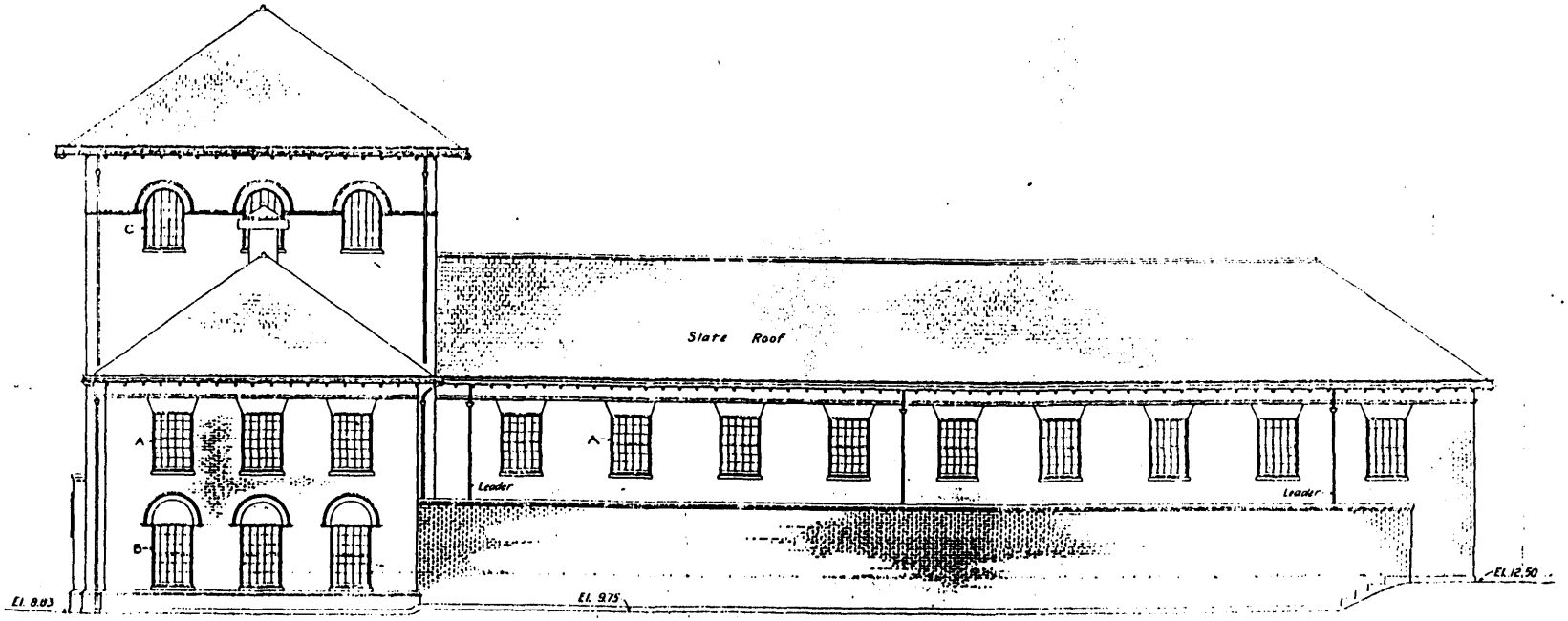
First Pumping Station and Circular Basin, c. 1885



Front Elevation

HACKENSACK WATER CO
FILTRATION PLANT
FRONT ELEVATION OF SUPERSTRUCTURE
SCALE ¼ INCH = 1 FT.
Dec. 1903

FILTRATION PLANT SUPERSTRUCTURE



Side Elevation

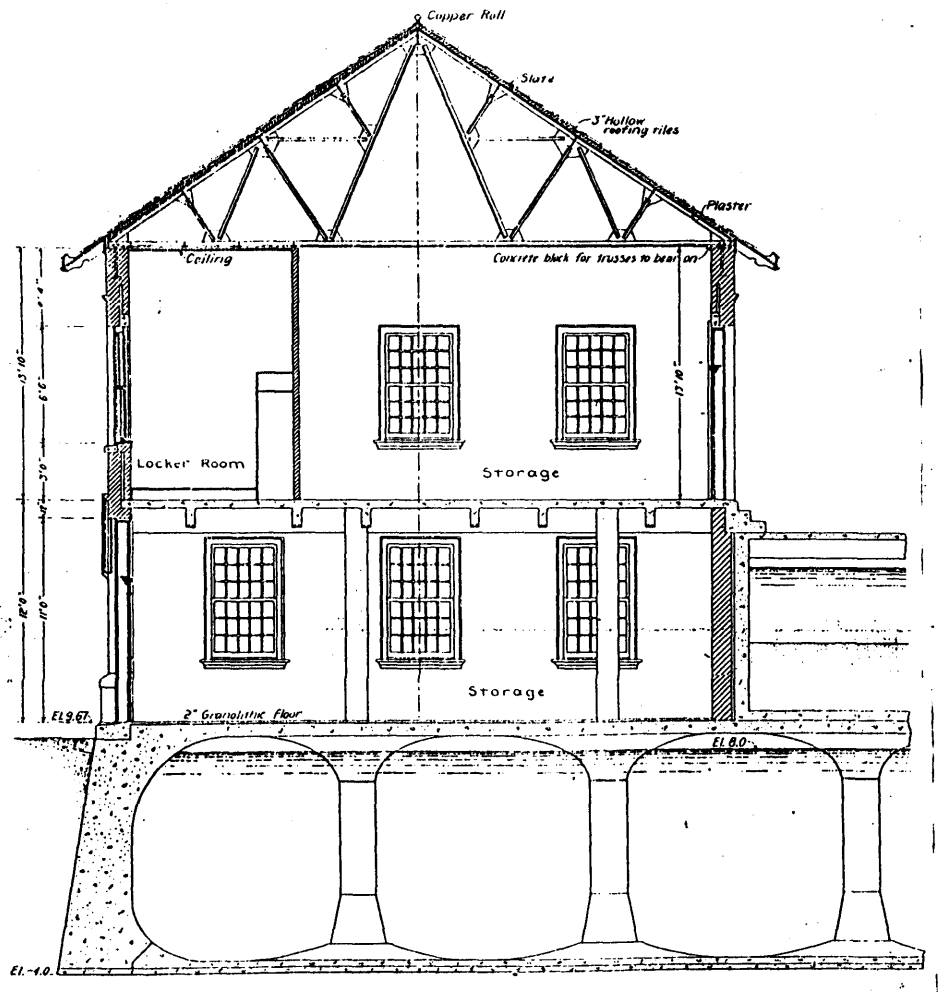
E 125

HACKENSACK WATER Co
FILTRATION PLANT
SIDE ELEVATION OF SUPERSTRUCTURE
SCALE $\frac{1}{8}$ INCH = 1 FT.
0' 10' 20'
Dec. 1903

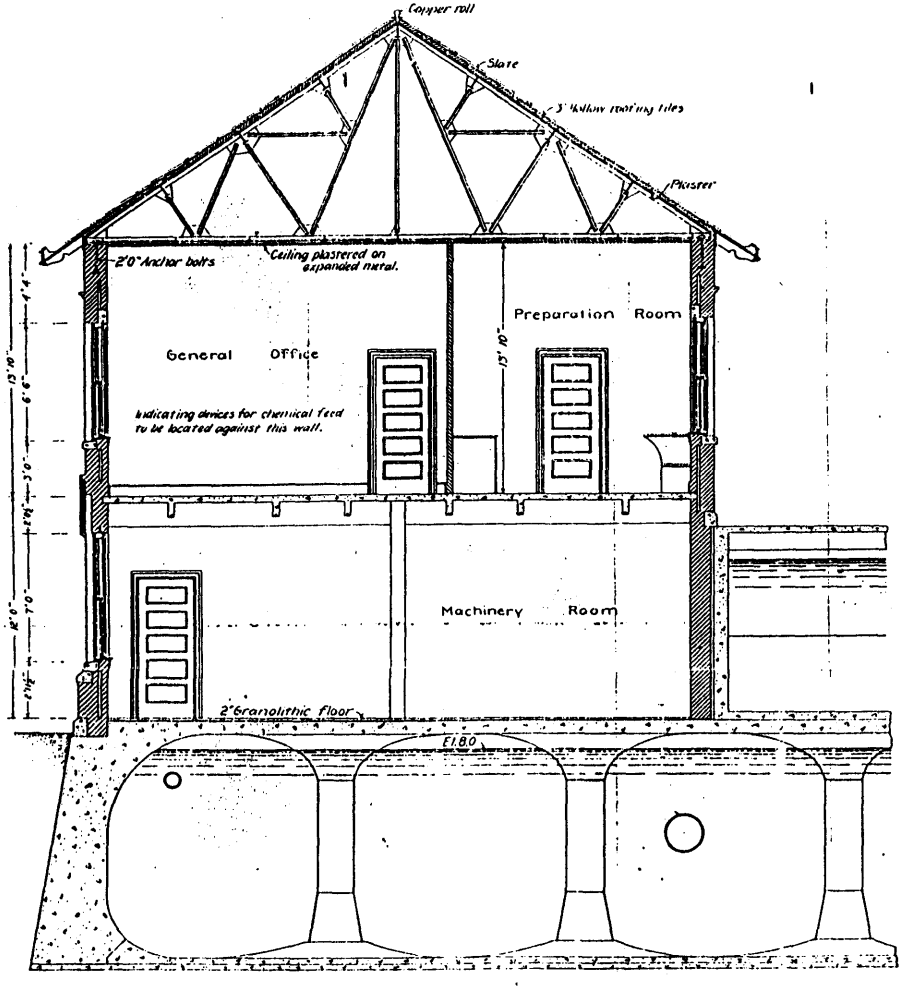
122-16 / 03 - 22
Sheet No. 22

OFFICE OF
HENING & FULLER
HYDRAULIC ENGINEERS AND SANITARY EXPERTS
170 BROADWAY
NEW YORK

Approved



Section through West Wing



Section through East Wing

8133

HACKENSACK WATER Co

FILTRATION PLANT

SECTIONS THROUGH EAST AND WEST WINGS

SCALE ¼ INCH = FT.

0' 5' 10'

FEB. 1904

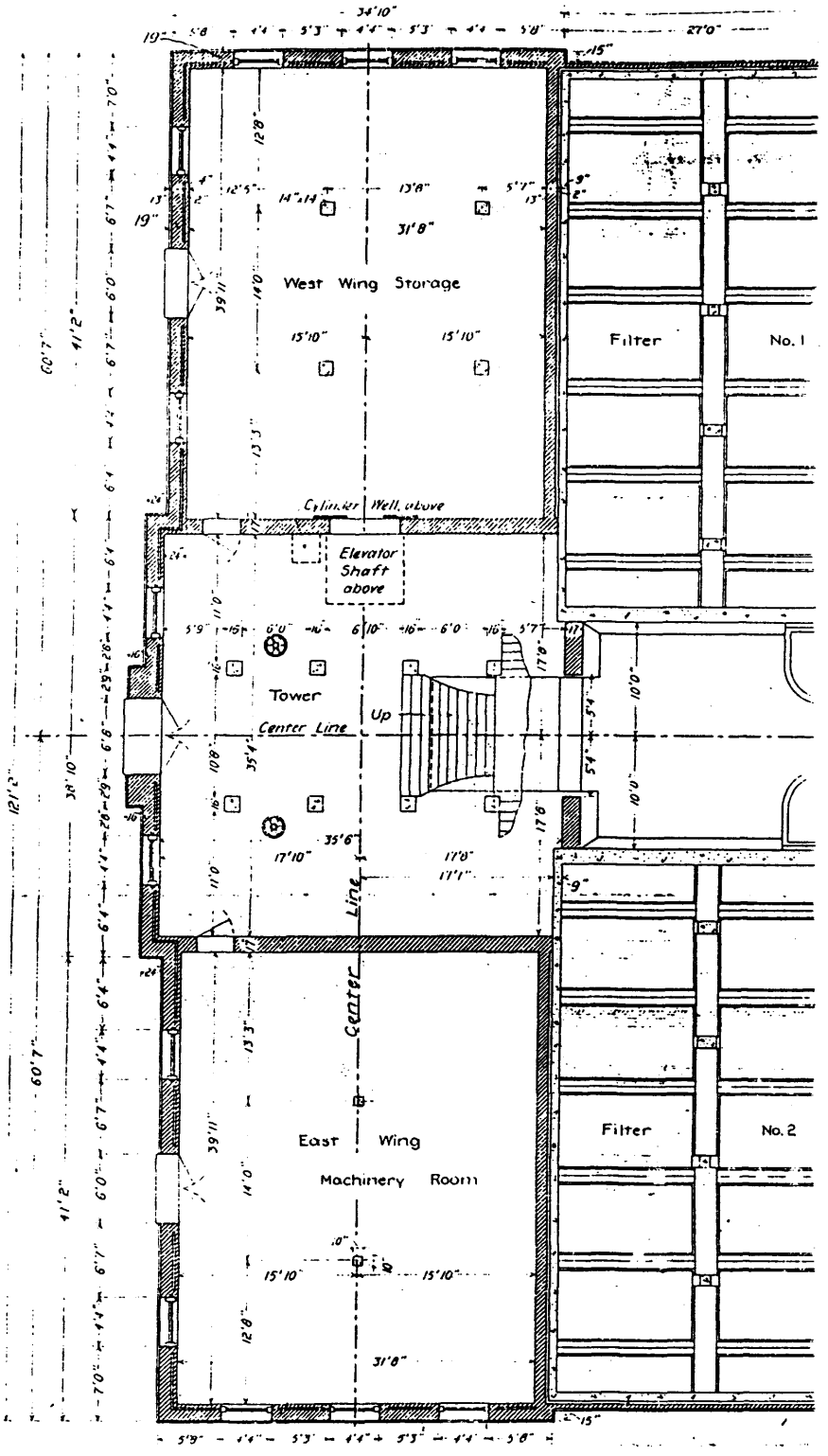
Approved Herring & Fuller

122-16 04 -30

Sheet No. 30

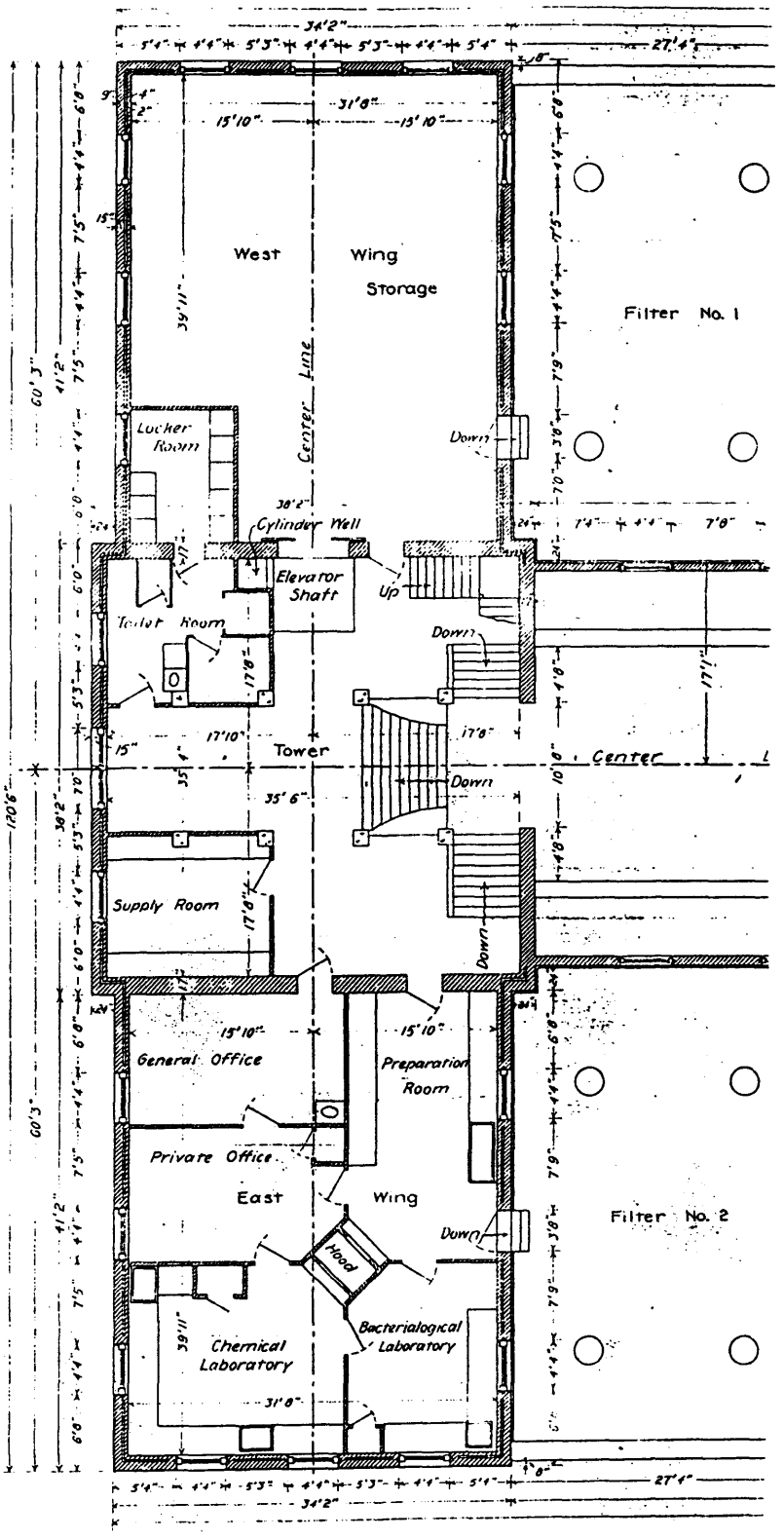
OFFICE OF
HERRING & FULLER
HYDRAULIC ENGINEERS AND SANITARY EXPERTS
170 BROADWAY
NEW YORK

Aug 30. 122-16 P



FLOOR PLAN - FIRST FLOOR

PURIFICATION PLANT - FILTRATION PLANT COMPLEX

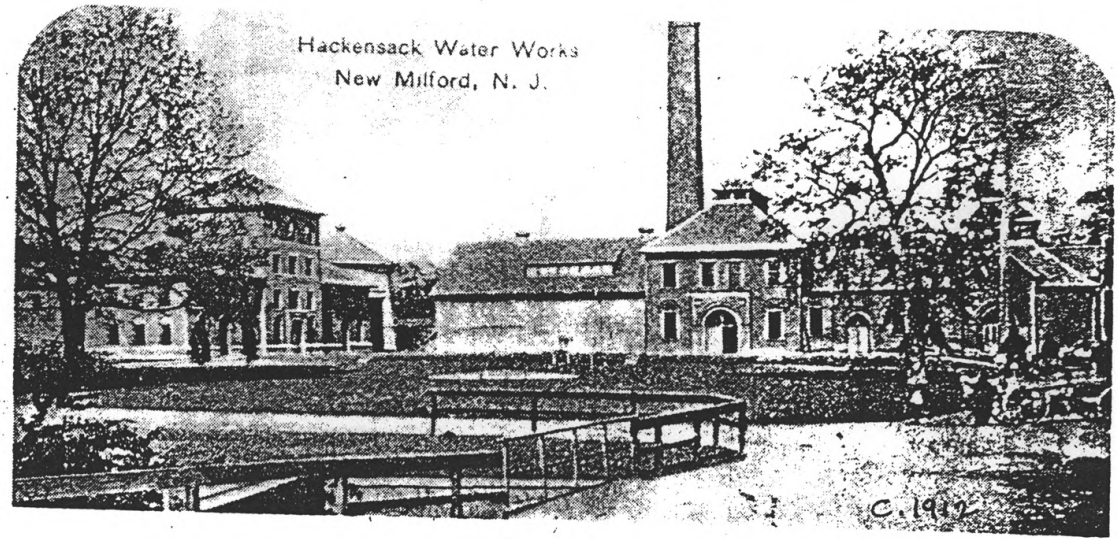


FLOOR PLAN - SECOND FLOOR

PURIFICATION PLANT - FILTRATION PLANT COMPLEX

ELEVATION AS SEEN FROM ELM STREET

SCALE 1/16"=1'-0"


Hackensack Water Works
New Milford, N. J.
C. 1912

THE WORTHINGTON PUMPING ENGINE.

AS APPLIED TO WATER WORKS.

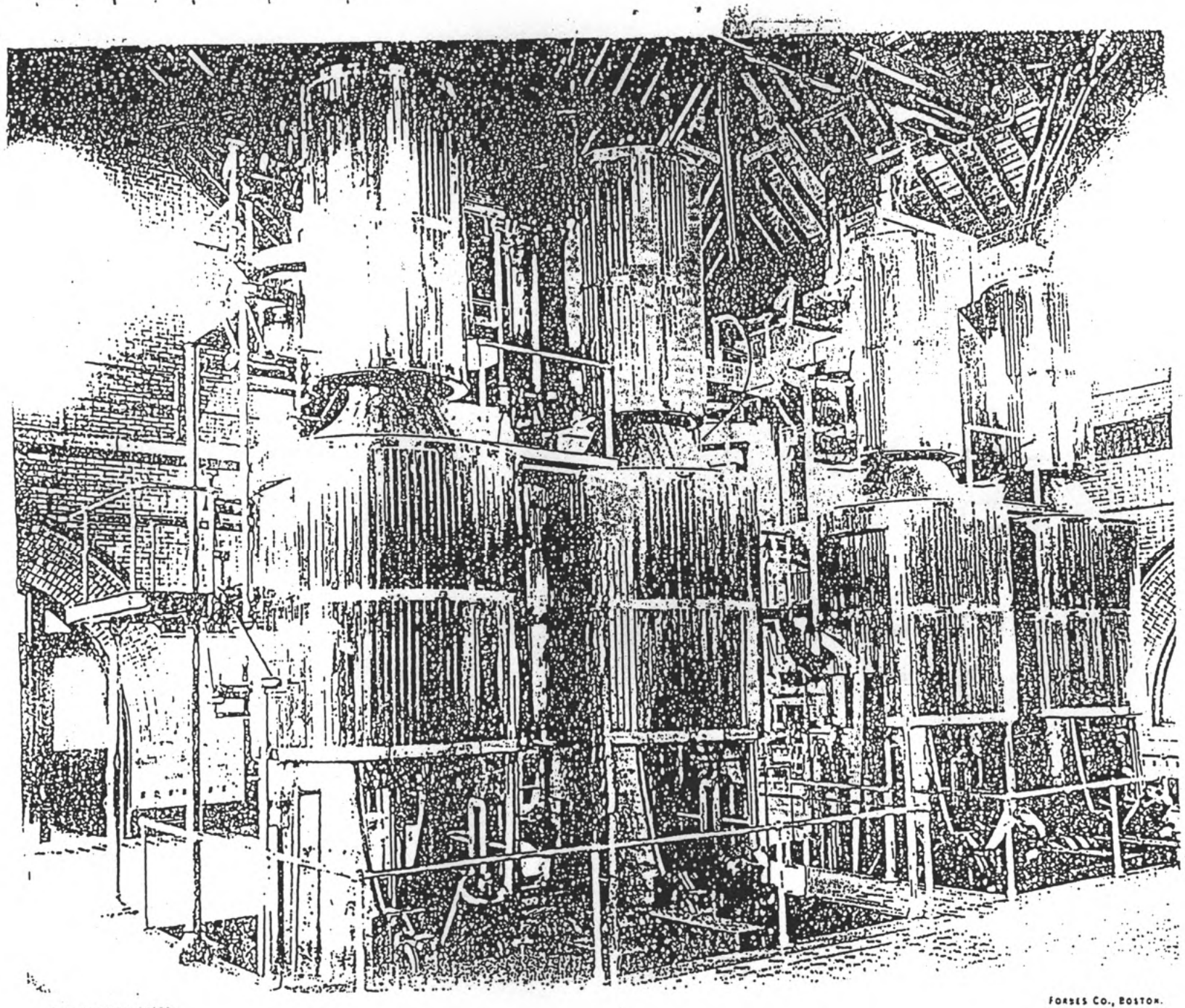
The following are some of the places at which Worthington Pumping Engines are in use for water-works purposes, the year in which they were delivered or put under contract, and their contract pumping capacity per day of 24 hours, stated in millions of gallons.

1860, Greenwood Cemetery.. ½
1861, Mt. Auburn, Mass..... ½
1863, Charlestown, " 5
1864, Wilmington, Del..... ½
1866, Annapolis, Md..... .. ½
1867, Charlestown, Mass.... 5
1868, Burlington, Vt.. ..... ¾
1869. " " ..... ¾
1869, Prospect Park, L. I.... 1
1869, Norristown, Pa..... 1
1869, Newark, N. J..... 5
1869, Cambridge, Mass..... 5
1870, Newark, N. J..... 5
1870, Salem, Mass..... 5
1870, Phila., Belmont Station, 5
1870, Hudson River Hospital, 1
1870, Portland, Oregon 1
1871, Phila., Belmont Station, 5
1871, Philadelphia.....11
1872, Charlestown, Mass.... 8
1872, Wilmington, Del..... 5
1872, Philadelphia..... 2
1872, Providence, R. I..... 5
1872, Rahway, N. J..... 3
1872, Bowling Green, Ky.... 1
1872, Zanesville, Ohio..... 2
1872, Poughkeepsie, N. Y... 3
1873, Salem, Mass..... 5
1873, Phila., Belmont Station, 8
1873, Jersey City, N. J.....16
1873, Conshohocken, Pa..... 1
1873, Phœnixville, Pa..... 1½
1873, New Bedford, Mass.... 3
1873, Waltham, Mass..... 1½
1873, Woburn, Mass..... 2
1874, Newark, N. J..... 8
1874, Cambridge, Mass..... 5
1874, Baltimore, Md.....13
1874, Phœnix Iron Works... 2½
1874, Toledo, Ohio 10
1874, Toronto, Canada. 5
1874, Montgomery, Ala..... 1
1874, Buffalo, N. Y.....10
1875, Newark, N. J..... 3
1875, Zanesville, Ohio..... 3
1875, Fall River, Mass... .. 5
1875, Bristol, Pa..... 1
1875, Montreal, Canada.....11
1875, Brookline, Mass..... 2
1875, Natick, Mass..... 1½
1875, College Point, L. I.... 2½
1875, Savannah, Ga..... 3
1875, Danville, Va..... 1
1875, Staunton, Va..... 1¼
1875, Bloomington, Ill..... 1
1875, Racine, Wis..... 1
1875, Michigan City, Ind.... 1½
1875, Yorkville, Canada..... 1½
1875, Media, Pa..... ½
1876, Toronto, Ont.....10
1876, Buffalo, N. Y.....15
1876, Jamaica Pond, Mass... 2½
1876, Centen'l Water Supply, 7
1876, Sandusky, Ohio..... 5
1876, Lowell, Mass..... 5
1876, Cleveland, Ohio.....10
1876, Springfield, Ill..... 3
1876, Danvers, Mass..... 2
1876, Newton, Mass..... 6
1876, Bordentown, N. J.... 1½
1877, Portland, Oregon..... 3
1877, Baltimore, Md..... 3
1877, Syracuse, N. Y.....10
1877, Mt. Holly, N. J..... ½
1877, Pittston, Pa..... 2
1877, Kalamazoo, Mich..... 2
1877, Bridgeton, N. J..... 1
1877, Rochelle, Ill..... ¾
1877, Willard Asylum, N.Y.. 1½
1878, Paterson, N. J..... 3
1878, Boston, Mass..... 3
1878, Burlington, N. J..... ½
1878, DeKalb, Ill..... ½
1878, Peru, Ind..... 2½
1878, Norwalk, Ohio..... 2½
1878, Jacksonville, Ill..... 2
1878, Lancaster, Pa..... 3
1878, Haverhill, Mass..... 1½
1879, Jersey City, N. J..... 3
1879, Woburn, Mass..... 2
1879, Houston, Texas..... 3
1879, New York, N. Y.....15
1879, Edgar Thomson Steel Co 7
1879, Cambria Iron Works... 3½
1879, Plymouth, Mass..... 1½
1879, Jacksonville, Fla..... 3
1879, Youngstown, Ohio 3
1879, Brookline, Mass..... 1
1879, Pennsylvania Steel Co.. 6
1879, Alameda, Cal..... 2
1879, Norfolk, Va..... 6
1879, Union Stock Yard, Chicago, Ill..... 2
1879, Tewksbury, Mass..... ½
1879, New Carlisle, Ind..... ½
1880, Macon, Ga..... 1
1880, Alton, Ill..... 1½
1880, Brantford, Canada..... ¾
1880, Nantucket, Mass..... 1½
1880, Rochelle, Ill..... ¾
1880, Jamaica Pond, Mass... ¾
1880, Calumet & Hecla..... 3½
1880, Norfolk, Va..... 2
1880, Wheeling, W. Va..... 3
1880, Edgar Thomson Steel Co 3½
1880, Peoria, Ill..... 4
1880, St. Joseph, Mo..... 4
1880, East Boston..... ¾
1880, Canton, Ohio..... 2
1880, Akron, Ohio..... 2½
1880, Waltham, Mass..... 1½
1880, Cleveland, Ohio.....10
1880, Newark, N. J..... 5
1880, Yonkers N. Y..... 3½
1880, Col. Coal & Iron Co... 1½
1880, Philadelphia, Pa.....10
1880, Danvers, Mass..... 2
1880, Albany and Rensselaer Iron and Steel Co..... 3
1880, Lancaster, Ohio..... 1½
1880, Danville, Va..... 2
1880, Alton, Ill..... 1½
1880, Buffalo, N. Y.....15
1880, Haverhill, Mass..... 1½
1880, City of Boston Sewerage, 50
1881, Auburn, Me ..... ¾
1881, Wilmington, N. C..... 2
1881, Wellsville, Ohio..... 1½
1881, St. Charles, Mo..... 1½
1881, Greenwood Cemetery.. ½
1881, Lowell, Mass..... ¾
1881, Somerville, N. J..... ½
1881, McKeesport, Pa..... 3
1881, Portland, Oregon..... ½
1881, Richmond, Va..... 6
1881, Chilicothe, Ohio..... 1½
1881, Keokuk, Iowa..... 1½
1881, Tombstone, Arizona... ½
1881, St. Louis, Mo..... ½
1881, Litchfield, Ill..... ½
1881, Otis Iron and Steel Co., Cleveland, Ohio..... ¾
1881, Edgar Thomson Steel Co. 14
1881, Standard Oil Co., Cleveland.....10
1881, Peabody, Mass..... 5
1881, Savannah, Ga..... 5
1881, Hackensack, N. J..... 6
1881, Long Branch, N. J.... 2½
1881, Cambria Iron Works .. 5
1881, St. Joseph, Mo..... 3
1882, Mt. Vernon, Ohio..... 2
1882, New Haven, Conn.... 6
1882, Burden Iron Works,... 3½
1882, Winona, Minn..... 4½
1882, Atlantic City, N. J.... 3
1882, Pottstown, Pa..... 1½
1882, Springfield, Ill..... 4
1882, Lowell, Mass..... ¾
1882, Cambridge, Mass..... 1
1882, Hamilton, Canada..... 1¼
1882, Ishpeming, Mich..... ¾
1882, Gunnison, Col..... 1½
1882, Locust Mountain, Pa.. 4¼
1882, West Chester, Pa..... 1
1882, Hot Springs, Ark..... 1
1882, Pernambuco, Brazil.... 1½
1882, New Brunswick, N.J. 3
1883, New York, N Y..... 6
1883, Standard Oil Co., Bayonne, N. J.....10
1883, Bradford, Pa..... ¾
1883, Olean, N. Y..... 1½
1883, Portland, Oregon.....10
1883, Phœnixville, Pa..... 1½
1883, Hackensack, N. J..... 4
1883, Portsmouth, Va..... 6
1883, Stratford, Ont..... 2½
1883, Yonkers, N. Y..... 1¼
1883, Milton, Pa..... .. 1
1883, Winfield, Kansas..... 1
1883, Alliance, Ohio..... 2
1883, Cambria Iron Works... 5
1883, Philadelphia, Pa.....37½

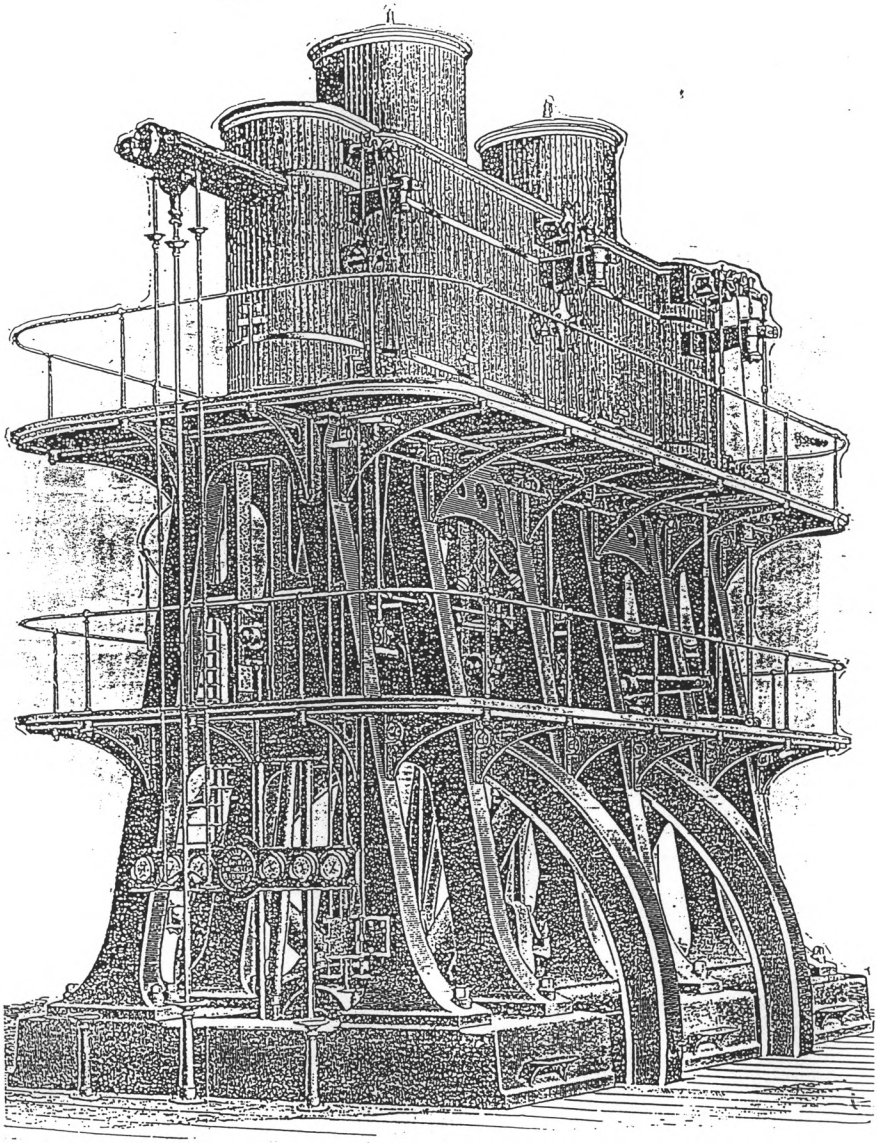
WORTHINGTON CRANK OR POWER PUMPS.

1877, San Antonio, Texas..... 1¼
1878, London, Ont..... 2
1878, Lewiston, Me..... 6
1879, New Brighton, Pa..... ¾
1880, Cooperstown, N. Y..... 1
1881, Somerville, N. J..... ½
1881, Winston, N. C..... ½
1882, New Brunswick, N. J..... 2½

To July 1st, 1883, total contract pumping capacity, 750,000,000 gallons in 24 hours.
A pamphlet fully descriptive of this department of the business furnished on application.



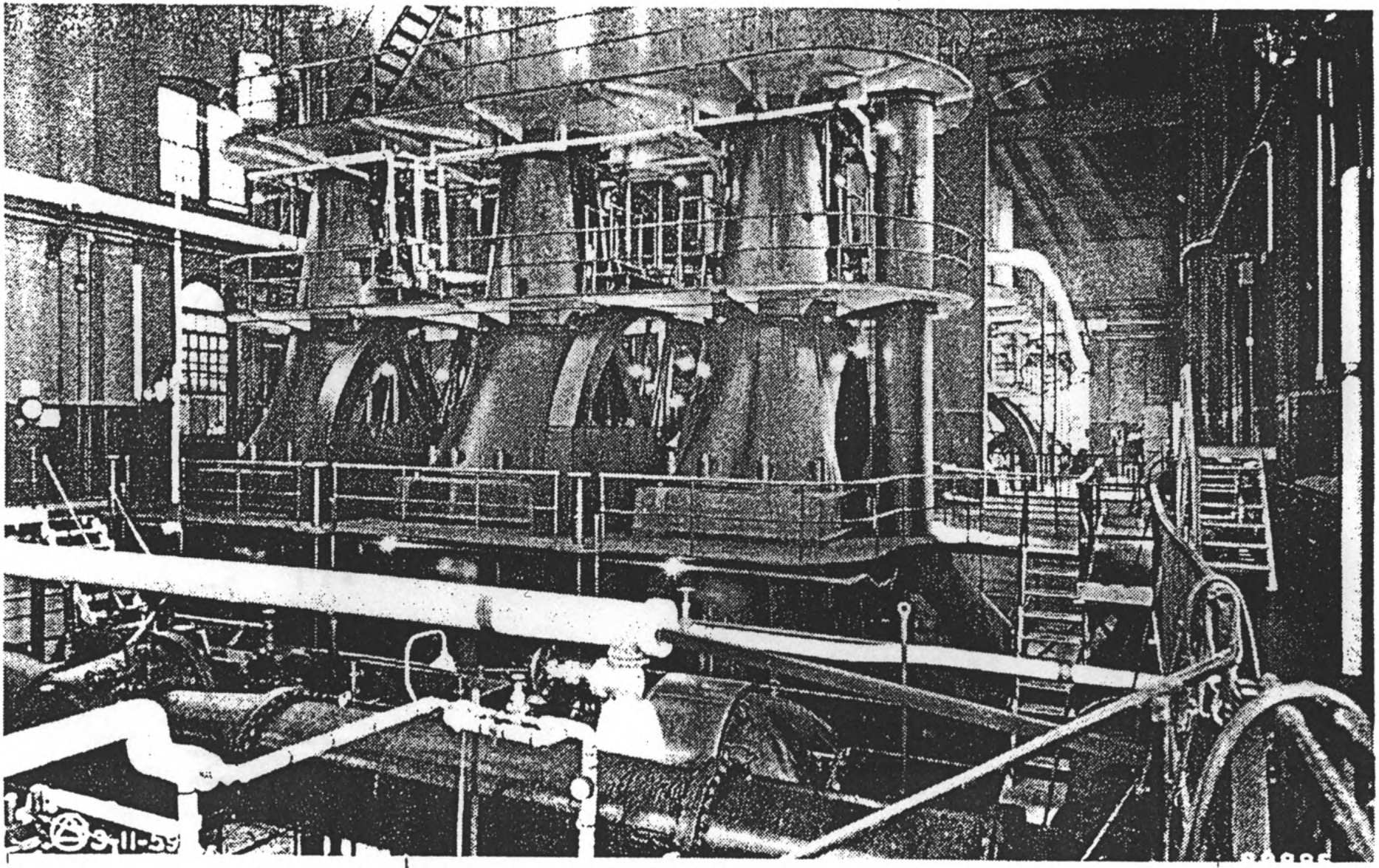
Vertical twin-cylinder non-rotative pumps.
(Ridgewood New Pumping Station—Interior above floor line.)



REYNOLDS' TRIPLE EXPANSION PUMPING-ENGINE, CHICAGO.

Capacity, 18,000,000 gallons daily.

BUILT BY THE EDW. P. ALLIS CO., MILWAUKEE, WIS.



Vertical High Service Pumps, Installed 1911

LEGEND:

Building Area

Outside Piping (Unfiltered Water)

Outside Piping (Filtered Water)

12 Pump No.

N

INTAKE

INTAKE (48" BRICK) CONDUIT

48" BRICK

DRIVEWAY TO CLAY ST.

To RAW WATER P.S. (PUMP HOUSE)

WATER MAIN

42" RAW WATER

PUMPING STATION

HEATER ROOM

OFFICE

OFFICE

BOILER

FROM RAW WATER P.S.

54" RAW WATER

MILFORD

NEW

FUEL OIL TANK

48" RAW WATER

48" SETTLED WATER

PLANT

PURIFICATION

FILTER PLANT

48" SETTLED WATER

INFLUENT CONDUIT

CLEAR WATER

1905

1912

1955

GARAGES

SERVICE GARAGE

STORE & MACHINE SHOP

STORE ROOM

DRIVEWAY

To Wash Water Decanting Facilities

COAGULATION & SEDIMENTATION BASIN

FIGURE IV-1

HACKENSACK WATER CO.
HARRINGTON PARK, N. J.

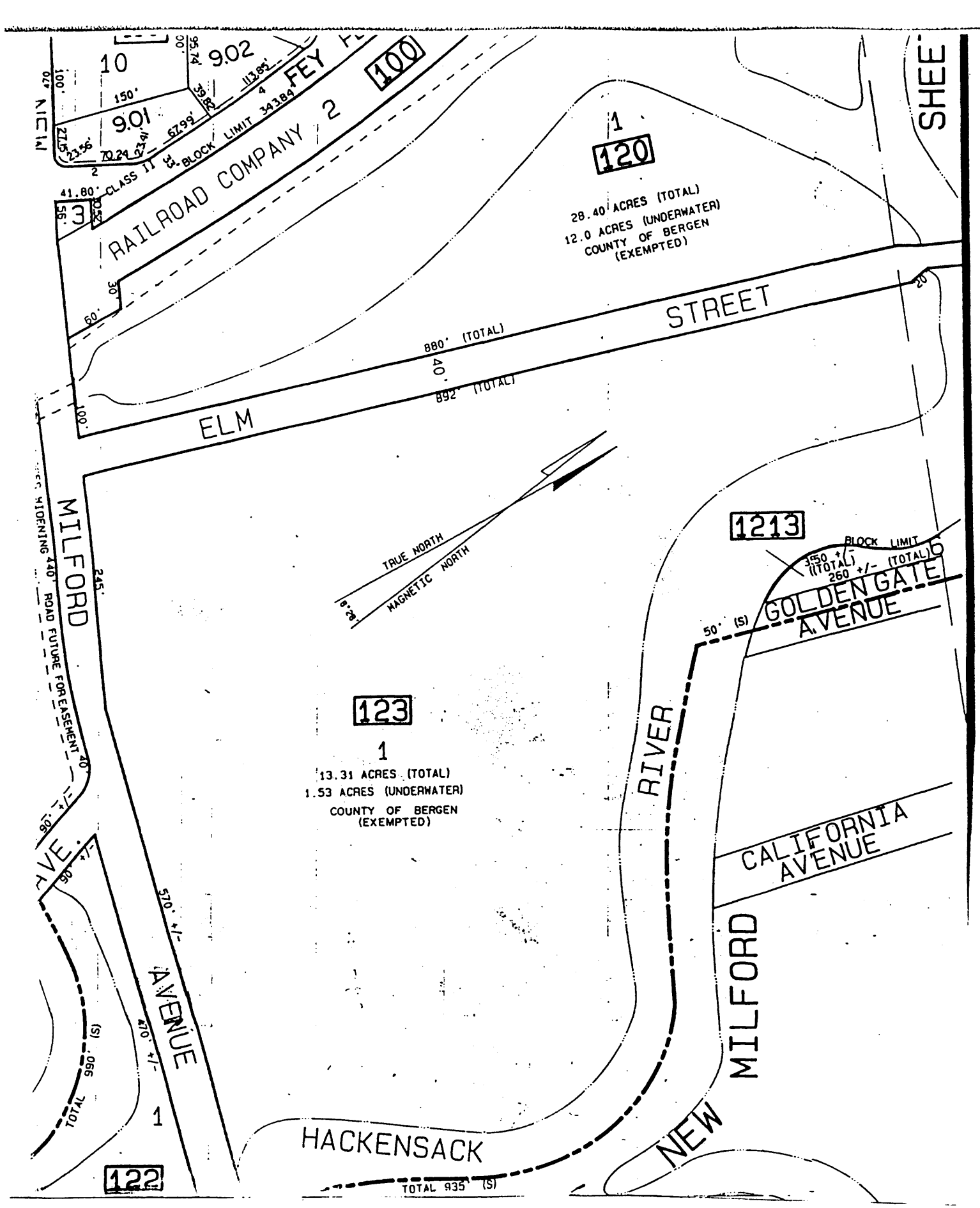
HAWORTH / NEW MILFORD
CONSOLIDATION PLAN

NEW MILFORD PLANT
EXISTING FACILITIES

SCALE 1" = 20' DATE APR. 1987

DRAWING NO. 141-M 86-4

PROJECT WORK NO. 5102 | DRAWN BY L.J.C. | TRACED BY P.T.



TAX MAP

BOROUGH OF ORADELL

BERGEN COUNTY, NEW JERSEY

SCALE: 1"=100' JULY 1985

M. O. SCHWANEWEDE P.E.L.S. 14230
201 THE PLAZA, TEANECK, NJ 07666