ERDC/CERL TR-10-4

Construction Engineering
Research Laboratory

US Army Corps
of Engineers®
Engineer Research and
Development Center

St. Regis Paper Mill

Architectural and Environmental Survey

Adam Smith, Sunny Adams, Megan Weaver Tooker,
Stephen Cosper, and Gary Gerdes

February 2010

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Construction Engineering Research Laboratory (CERL)
U.S. Army Engineer Research and Development Center
2902 Newmark Dr.
Champaign, IL 61822-1076

Final Report

Prepared for Fort Drum
Directorate of Public Works
Cultural Resources Management
Fort Drum, New York 13602

Abstract: This survey was initiated for a Section 110 process at Fort Drum, NY and was developed for the Fort Drum Directorate of Public Works (DPW) Environmental Division by evaluating the mill site for potential environmental and cultural issues. This architectural and environmental survey of buildings located at the St. Regis Paper Mill and the adjacent Village of Deferiet, NY contains a preliminary determination whether the St. Regis Paper Mill, the Village of Deferiet, or both locations, are eligible for the National Register of Historic Places (NRHP) as a historic district, and whether any buildings are individually eligible for the NRHP. This report also contains a survey and recommendations of environmental issues at the St. Regis Paper Mill. It is the determination of this report that the Village of Deferiet as a district is eligible for the NRHP. None of the mill buildings or buildings located within the Village were found to be individually eligible for the NRHP, nor was the St. Regis Paper Mill found to be a historic district eligible for the NRHP.

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Preface

This study was conducted for Fort Drum, New York, under project number 156941, "St. Regis Paper Mill, Buildings Survey." Funding was provided by Military Interdepartmental Purchase Request (MIPR) 21/2020/220/-MIPR8LDATSS004, dated 20 August 2008. The Fort Drum technical monitor was Dr. Laurie Rush, Cultural Resource Manager.

The work was performed by the Land and Heritage Conservation Branch (CN-C) of the Installations Division (CN), Construction Engineering Research Laboratory (CERL). Adam Smith was the CERL Project Manager and lead architectural historian, Sunny Stone was the assistant architectural historian, Megan Weaver Tooker was the landscape architect, and Stephen Cosper and Gary Gerdes were the environmental specialists. Special acknowledgement is given to those who assisted with the formation of this report: Timothy J. Abel, Director of the Jefferson County Historical Society Museum, Dave Shampine, staff writer for the Watertown Daily Times, and the Carthage Library. Dr. Christopher White is Chief, CN-C, and Dr. John Bandy is Chief, CN. The Deputy Director of CERL is Dr. Kirankumar V. Topudurti. The Director of CERL is Dr. Ilker R. Adiguzel.

CERL is an element of the U.S. Army Engineer Research and Development Center (ERDC), U.S. Army Corps of Engineers. The Commander and Executive Director of ERDC is COL Gary E. Johnston, and the Director of ERDC is Dr. Jeffery P. Holland.

Unit Conversion Factors

Multiply	By	To Obtain
acres	4,046.873	square meters
degrees Fahrenheit	(F-32)/1.8	degrees Celsius
feet	0.3048	meters
gallons (U.S. liquid)	3.785412 E-03	cubic meters
horsepower (550 foot-pounds force per second)	745.6999	watts
inches	0.0254	meters
miles (U.S. statute)	1,609.347	meters
square feet	0.09290304	square meters
square miles	2.589998 E+06	square meters
square yards	0.8361274	square meters
yards	0.9144	meters

1 Introduction

Background

Through the years, the U.S. Congress has enacted laws to preserve the National cultural heritage. The first major Federal preservation legislation was the Antiquities Act of 1906, which was instrumental in securing protection for archeological resources on Federal property. The benefits derived from this Act and subsequent legislation precipitated an expanded and broader need for the preservation of historic cultural resources. With this growing awareness, the Congress codified the National Historic Preservation Act of 1966 (NHPA), the most sweeping cultural resources legislation to date.

The Congress created the NHPA to provide guidelines and requirements aimed at preserving tangible elements of the nation's past primarily through the creation of the National Register of Historic Places (NRHP). Sections 110 and 106 of this legislation contain requirements for Federal agencies to address their cultural resources, defined as any prehistoric or historic district, site, building, structure, or object. Section 110 requires Federal agencies to inventory and evaluate their cultural resources. Section 106 requires the determination of effect of Federal undertakings on properties deemed eligible or potentially eligible for the NRHP.

Fort Drum, NY, consists of 107,265 acres. Its mission includes command of active component units assigned to the installation, provide administrative and logistical support to tenant units, support to tenant units, support to active and reserve units from all services in training at Fort Drum, and planning and support for the mobilization and training of up to 80,000 troops annually. The mission of the 10th Mountain Division (LI) is to be manned and trained to deploy rapidly by air, sea, and land anywhere in the world, and, on arrival, to be prepared to fight and win. The command at Fort Drum is interested in acquiring the former Newstech paper mill site to use for Military Operations on Urban Terrain (MOUT) training. The paper mill has not been in use since 2004, and is adjacent to the Fort Drum fence line. The entire site consists of 280 acres of both industrially developed and un-developed land.

In the context of these possible changes, this work was undertaken to research, inventory, and assess for the area known as the St. Regis Paper Mill and the Village of Deferiet to provide sufficient information to support a determination of eligibility or ineligibility of the St. Regis Paper Mill as a National Register of Historic Places district.

Objectives

The objective of this work was to research, inventory, and assess for Fort Drum (Figure 1) the area known as the St. Regis Paper Mill and the Village of Deferiet (Figure 2) providing sufficient information to support a determination of eligibility or ineligibility of the St. Regis Paper Mill as a National Register of Historic Places district. (This Section 110 survey was necessary to fulfill Fort Drum's responsibility to the NHPA.)

Approach

The objectives of this project were accomplished in the following steps:

1. Site visits was made 17–21 November 2008 and 12–16 January 2009.
2. A literature search was done into the history of the St. Regis Paper Mill and the Village of Deferiet, NY.
3. All buildings were inventoried and their basic condition were assessed.
4. The history of the process of milling was researched.
5. The architectural and landscape resources of the St. Regis Paper Mill and the Village of Deferiet, NY were photographed.
6. The eligibility of the St. Regis Paper Mill and the Village of Deferiet to the National Register was analyzed.
7. Recommendations were made to confirm findings of the Conestoga-Rovers environmental assessment to Fort Drum DPW Environmental Division.

Mode of Technology Transfer

This report will be made accessible through the World Wide Web (WWW) at: URL: http://www.cecer.army.mil

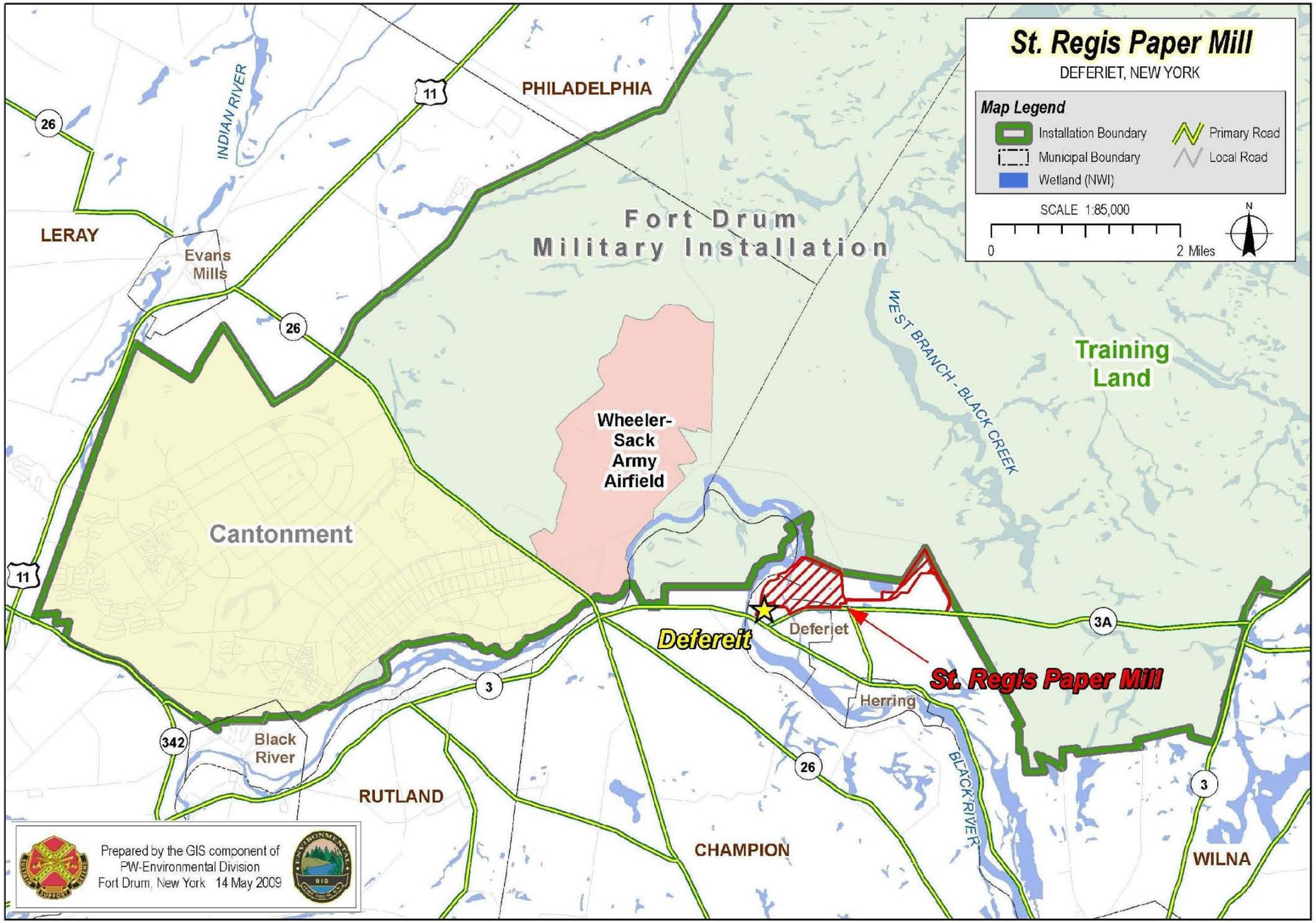


Figure 1. Fort Drum installation map.

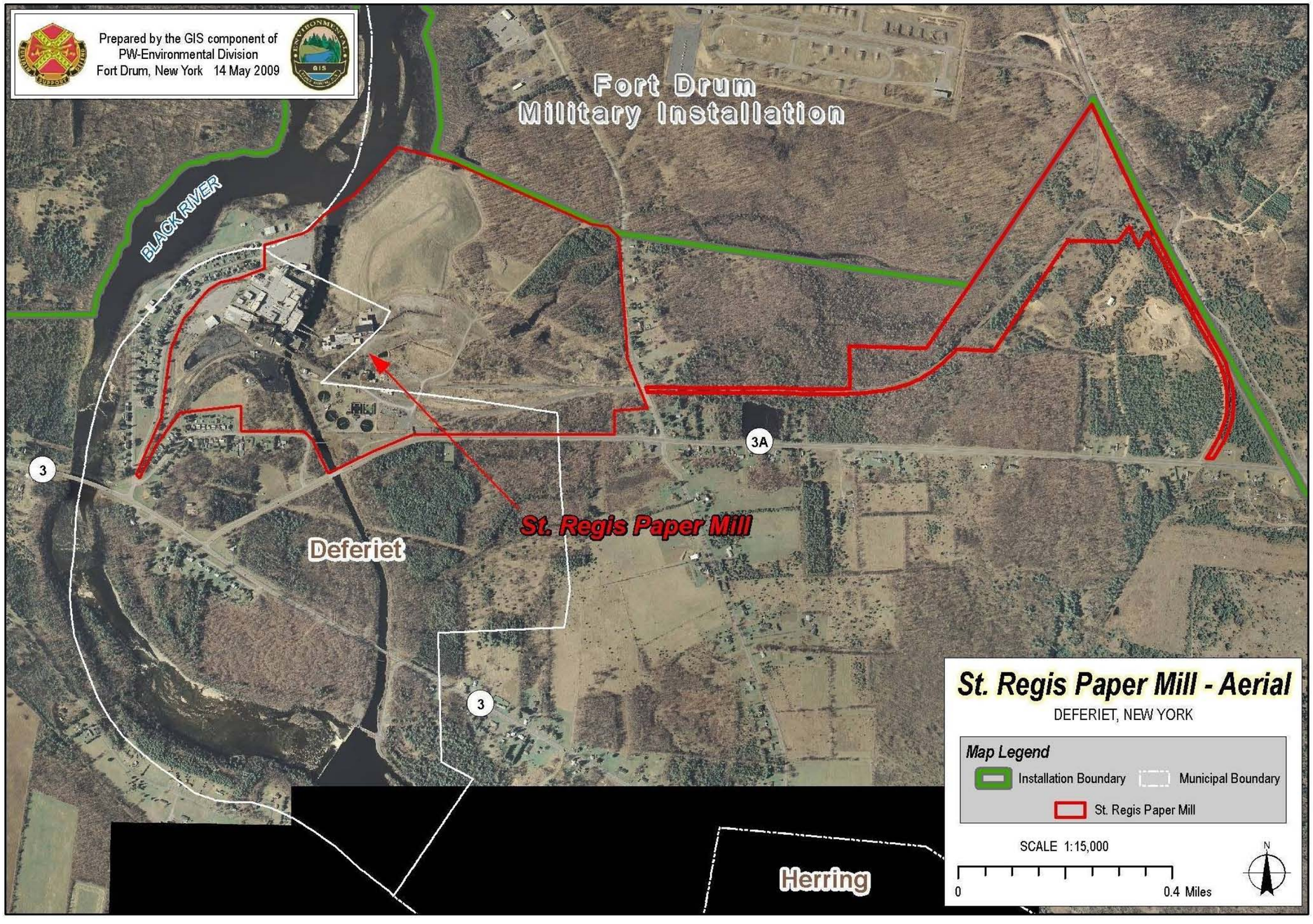


Figure 2. Location of St. Regis paper mill and the village of Deferiet, NY.

2 Methodology

Introduction

Per Section 110 of the NHPA, Fort Drum must evaluate all of its buildings and structures 50 years of age and older. Prior to any type of property acquisition, the Fort Drum DPW Environmental Division must evaluate the site for potential environmental and cultural resource issues. Under a Military Interdepartmental Purchase Request (MIPR), the Cultural Resources and National Environmental Policy Act (NEPA) sections of the Environmental Division retained ERDC-CERL to undertake the project by performing a preliminary review of available information about the site, to completing an inventory and condition assessment, and Determination of Eligibility (DOE) for the properties located at Deferiet.

The CERL approach consisted of two primary efforts: (1) a review of available documents that addressed the environmental condition of the site, and (2) site visits to determine the current condition of the paper mill. Limited resources prevented any further physical or chemical evaluation of the site, such as the taking and analysis of liquid or solid.

A visual inspection of the entire site was conducted during the site visits. CERL researchers investigated and photographed most buildings areas and walked through the open area to the north and east of the mill buildings. The focus of the November 2008 site visit was largely to confirm findings of the Conestoga-Rovers environmental assessment. During the site visit, CERL met with personnel from the Village of Deferiet Public Works department and Brookfield Power who had personal knowledge of the paper mill site. Potential safety and health issues were also noted during this site visit.

There are two options for the Government to acquire the paper mill property for use as a training area. The property could be purchased and joined with the existing Fort Drum real property inventory or the Government could enter into a lease agreement allowing the Army to conduct training exercises. The following paragraphs discuss the environmental and safety/health concerns and potential liabilities with respect to leasing and purchasing the property.

Description of the Property

The industrial area consists of structures on either side of a man-made millrace originally used for mechanical power for mill equipment in the early 1900s. Structures on the east side of the race housed wood grinding and bleaching operations, dewatering equipment, locomotive maintenance, and industrial wastewater treatment. Structures on the west side of the race primarily housed the equipment used to transform bleached pulp into paper products. Also on the west side are the boiler plant, coal pile site, ash pond, and vehicle maintenance building. An operating hydroelectric plant owned by Brookfield Power straddles the waterway. Figure 3 shows a view of the mill from the north, while still operational. Figure 4 shows a recent, annotated aerial photo, before major demolition work.

In the early years, the mill made pulp through a chemically intense sulfite pulping process, which would have created a very strong wastewater. In later years, the mill made ground wood pulp (for newspapers and magazines), which is more a mechanical than a chemical process. They also purchased commercial pulp from other mills. While many of the buildings in the industrial area remain intact, the current owner has conducted salvage operations throughout the site to recover and sell materials of value, such as copper, steel, and aluminum. Some of the structures have been damaged during the salvage operation, and should be evaluated by a structural engineer to determine if the structures themselves present a danger to occupants. Most of the structures do not seem to be in immediate danger of collapse. However, many doorways and other openings in the exterior walls have unsupported masonry, which does present an immediate danger. There are varying amounts of demolition debris on the floors of all of the buildings, as well as adjacent grounds around the structures.

Much of the ground near the industrial buildings has been used for the accumulation of demolition debris and the dumping of old equipment. The remainder of the site, which is the majority of the acreage, consists of pine and mixed forest, meadows, lowland areas, and small ponds. The Village of Deferiet water utility has infrastructure on the site. The Village owns an operating well on the north edge of the property, a small abandoned pump house located between the wood grinding buildings and the east property line, and a buried water line connecting those two locations with a well that is south of the site along Rte 3A.

Figure 3. Aerial view of the St. Regis paper mill in operation (looking south), undated(source: Low Impact Hydro Institute, http://www.impacthydro.org).

Figure 4. Annotated aerial overview (looking north).

Archival research

Archival research involves several tasks. The first task is the initial literature review. The second is to identify and locate primary research materials.

Literature review

The research team used secondary literature to determine the general history of the St. Regis Paper Mill. This involved reading published and unpublished material found throughout various sources. Three documents contained information that was relevant to the CERL investigation: the "Phase 1 Environmental Site Assessment," dated July 2005 and conducted by Conestoga-Rovers & Associates (CRA) for Newstech NY, Inc., a former owner of the site; "Asbestos Inspection for Damaged Suspect Asbestos-Containing Materials," prepared by Certified Environmental Services, Inc. (CES) in 1999 for the Champion Paper Mill, the site owner prior to Newstech; and a second asbestos report titled, "Limited Asbestos-Containing Materials Survey Report" prepared by CES in 2007 for Deferiet Development, LLC. Other documents obtained involving the site were limited to site maps and drawings.

Research review

The research team then located primary research materials and additional secondary materials to establish a strategy to best use these resources. One member of the research team conducted a visit to the Jefferson County Historical Museum, Carthage Library, and the Watertown Daily Times newspaper archives in January 2009.

Site visits

Members of the research team conducted two site visits to survey the buildings at St. Regis Paper Mill and conduct research. The site visits occurred 17–21 November 2008 and 12–16 January 2009. During the site visits, the researchers collected archival information such as maps and historic photographs from Fort Drum and made preliminary determinations of structural/environmental concerns and historic significance. Researchers conducted reconnaissance on foot using photography, sketches, and note taking to help in getting an overall feeling for the St. Regis Paper Mill

and the Village of Deferiet as a whole and for the individual buildings. Janet Zando, the Village historian, was unable to be reached during the site visits.

Analysis

After the initial research was complete, the team analyzed the gathered information and resources. Historic maps and photographs were examined and compared to current day conditions. For those resources with significance based on the historic context and themes, a determination of integrity was made.

Evaluation

The evaluation of structures and landscapes follows the guidelines in the National Register Bulletin #15, How to Apply the National Register Criteria for Evaluation, and National Register Bulletin #16, How to Complete the National Register Form. In addition, the survey followed the Army's guidance for "Documenting and Evaluating Historic Military Landscapes: An Integrated Landscape Approach."

3 Overview

Company Timeline

The St. Regis Paper Company began in Deferiet, NY, in 1899. Investors decided in December of 1901 to build a mill with the hope of high profit, possible due to the high cost of newsprint at the time. Plans were drawn up in March 1901 and construction began on 9 June 1902. It was built to be the most modern paper mill in the United States, and when finished, it was the largest mill in the area. The walls of the mill were made of concrete, of which very few other buildings at the time were constructed. The achievement encompasses not only an immense hydraulic canal and a group of gigantic mill buildings, but a new village, with a new school house, store, public hall, and hotel.

The site chosen for the paper mill was 645-acre tract of land situated a few miles from Felts Mill, NY, on the Black River. The new mill was located at the point where the river forms a reverse "S," with a gradual fall in the water level of about 45 ft. The plan was to build a 4400-ft canal to harness this drop, using the water to generate power for two paper machines (Deferiet Mill Master Plan, Facility Improvement Program, p 7). The wood resources of the nearby Adirondack Mountains made this an excellent area for papermaking.

In the process of development of this mill, three men stood out of a group of skilled men. In the beginning of the plans, David M. Anderson and George C. Sherman who already had successfully managed the building and operation of the Taggarts Company Mill at Felts Mill, saw some of the possibilities of the water power at the convergence of the Black River and the Village of Deferiet. They began studying, planning, and seeking scientific counsel. They turned to George W. Knowlton, a man with extensive business experience, for financial support. Mr. Knowlton became the president and one of the largest holders of stock of the mill (Figure 5) (Watertown Daily Times).

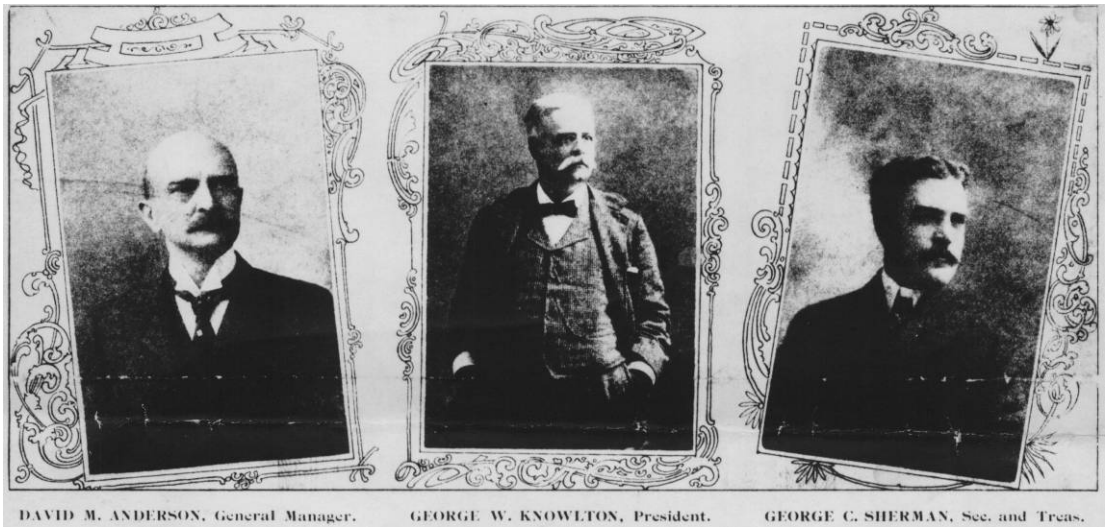


Figure 5. The original men of the St. Regis Paper company; David M. Anderson, George W. Knowlton, and George C. Sherman.

Production began at the mill in 1901 with two newsprint machines and 200 employees. The original mill had a rated capacity of 100–150 tons per day; the sulfite mill produced 40 tons daily. A third machine was installed in 1907 (Deferiet Mill Master Plan, Facility Improvement Program, p 7).

After 16 years, the St. Regis Paper Company was merged with Champion Paper, which was created in Hamilton Ohio in 1893. When the merge happened, production was dropped to 25 tons a day. However, this did not stop Champion Paper. The company invested heavily in the mill and the Village of Deferiet.

By 1922 the village was company-owned with 1500 residents living in company-owned houses and apartment buildings (Figure 6), but in the 1960s the company sold the houses.

The first major expansion after World War II entailed the installation of a No. 6 paper machine for producing directory paper, construction of a new acid plant, and enlargement of the sulfite mill from 75 to 100 tons per day. In 1948 a sheet department was installed, the power plant rebuilt, and two 100,000 lb. capacity boilers were added (Deferiet Mill Master Plan, Facility Improvement Program, p 7).

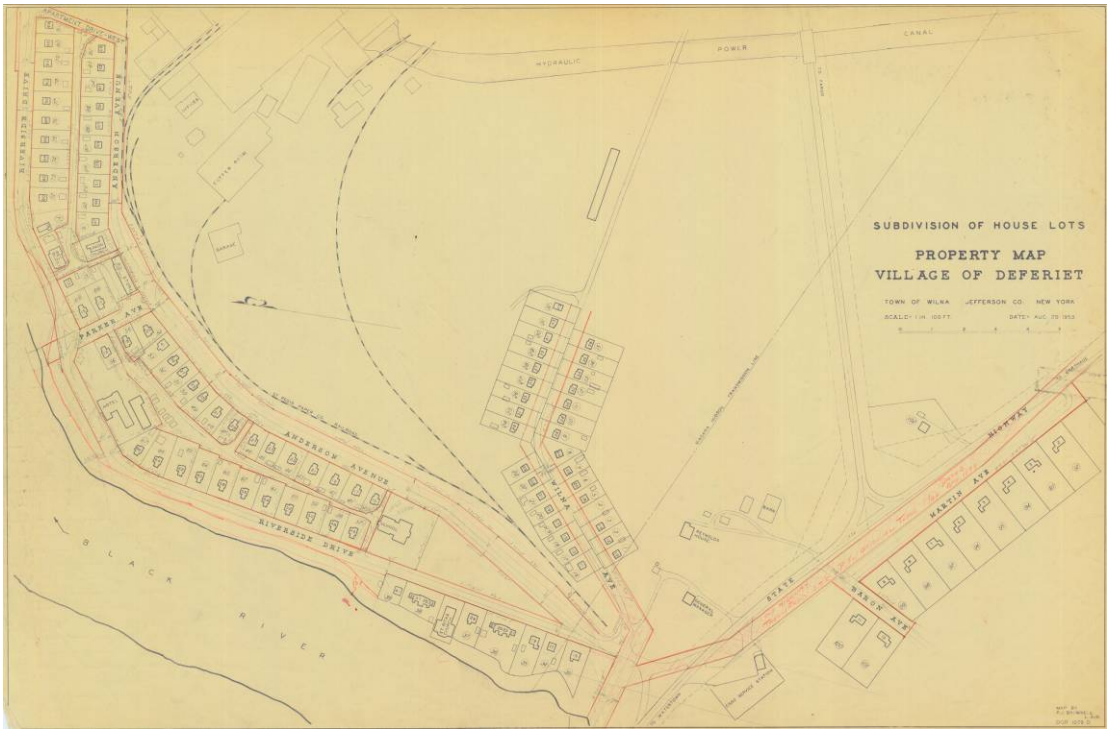


Figure 6. Subdivision of house lots (1953).

In 1970 the mill was in danger of closing due to declining profits. At that time, the management of St. Regis decided to close the sulfite mill to comply with pollution restrictions and to embark on a modernization program to improve quality and efficiency of the mill. In 1971, a new woodroom facility was added to receive logs from woodlands from Vermont, New Hampshire, as well as from local suppliers (Deferiet Mill Master Plan, Facility Improvement Program, p 7).

In 1984, Champion bought the St. Regis Corporation for $1.8 billion, which rescued St. Regis from a hostile takeover by Australian newspaper magnate Rupert Murdoch. St. Regis had been one of the largest U.S. producers of magazine paper and newsprint.

In 1986, D.S. Smith Plc. paid 83 million pounds for the St. Regis Paper Company. Originally part of the U.S.-based St. Regis paper group, the U.K. operation had been spun off at its parent's hostile takeover by Champion Consolidated in 1984. The addition of St. Regis extended Davis S. Smith's operations into the paper sector, while making it a major player in the United Kingdom's packaging sector. Today, the St. Regis Paper Company

Ltd. is not affiliated with the original St. Regis, which ceased to exist in 1984 (i.e., the Canadian company buying Deferiet paper mill).

On 11 May 1999, Champion International Corporation and the Deferiet Paper Company, a new wholly owned subsidiary of Crabar Paper & Allied Products Corporation, announced that they signed an agreement for the sale of Champion's groundwood specialty mill in Deferiet to the Deferiet Paper Company. The mill, at that time, produced approximately 225,000 tons per year of coated groundwood, uncoated groundwood,• supercalendered,• and coated freesheet• specialty papers for the publishing and wholesale distribution industry. Approximately 600 employees were working at this facility in 1999 (Canadian company buying Deferiet paper mill).

The Deferiet Paper Company (subsidiary of Crabar Paper & Allied Products Corporation) filed for bankruptcy protection in March 2001, citing $82 million in debt and laying off more than 300 employees. The company owed $40 million to major creditors BT Commercial Corporation and $10 million to International Paper Company as well as several other creditors. The mill's assets at the time included 520 acres of land, containing a 377 acre landfill. The Deferiet plant and its contents were put up for auction in July 2001, initially as a complete set. When no bidders stepped forward, the mill's assets were offered as individual pieces. The sale only produced a single buyer for one of the plant's five paper machines (No. 6 paper machine), and the remainder was liquidated at auction (i.e., the Canadian company buying Deferiet paper mill) (All Business 2001).

Newstech Inc., an affiliate of private investment company Belkorp Industries, Inc., reopened the mill in 2003. The mill became operational as a single machine mill producing about 200 tons per day of directory grade paper from 100 percent recycled material. Recycled pulp was shipped to the mill from plants in Maryland and Pennsylvania, owned by Belkorp.

• Groundwood – wood pulp consisting of groundwood that has not been cooked or chemically treated, used for making newsprint and other poorer grades of paper. Also called mechanical pulp.

• Supercalendered – Calendered groundwood paper made using alternating chrome and fiber rollers that makes a very smooth, thin sheet of paper known as supercalendered paper. Typically used for magazines, catalogs, and directories.

• Freesheet – Paper manufactured with no more than 10% mechanical (groundwood) pulp. Most freesheet paper is completely free of mechanical pulp. Typically used for writing papers and applications requiring archival quality stock because the paper will not yellow as quickly as groundwood paper.

The company planned to install a second paper machine, but had no definite timeline for what that would actually take place.

On 1 February 2004, Newstech idled the Deferiet Mill and announced a "temporary" shutdown. When the closed paper mill was acquired by Deferiet Development LLC, Phoenix, NY, in January 2005, the new company's owner said he envisioned turning the complex into an environmentally friendly commerce park consisting of several light manufacturers; however, the mill has been heavily salvaged and demolished.

Currently, the 240-acre site is still under the ownership of Deferiet Development (Edward A Palmer and Gary Spring). The majority of the mill property has been heavily salvaged and demolished and a large amount of back-taxes and penalties are due, which is preventing the county from foreclosing on the former paper mill property. The two owners are intending to complete some structural demolition and turn it over as a safe parcel to the county. The Trustees of the county would rather have an owner who could pay the taxes, since the six-parcel site consisted of about a quarter of the village's taxable base. The village does not have much interest in acquiring the site, and owners of Deferiet paper mill indicate that they cannot pay back taxes) (Watertown Daily Times 2009).

The Builders•

The list of men and firms whose talents have been employed in the construction of the canal and the mills and the other work connected with the St. Regis establishment is a long one and includes some well known names.

The E.D. Jones Son's Co., Architects, of Pittsfield, MA, with an extensive experience in mill construction, designed the general scheme for the great plant.

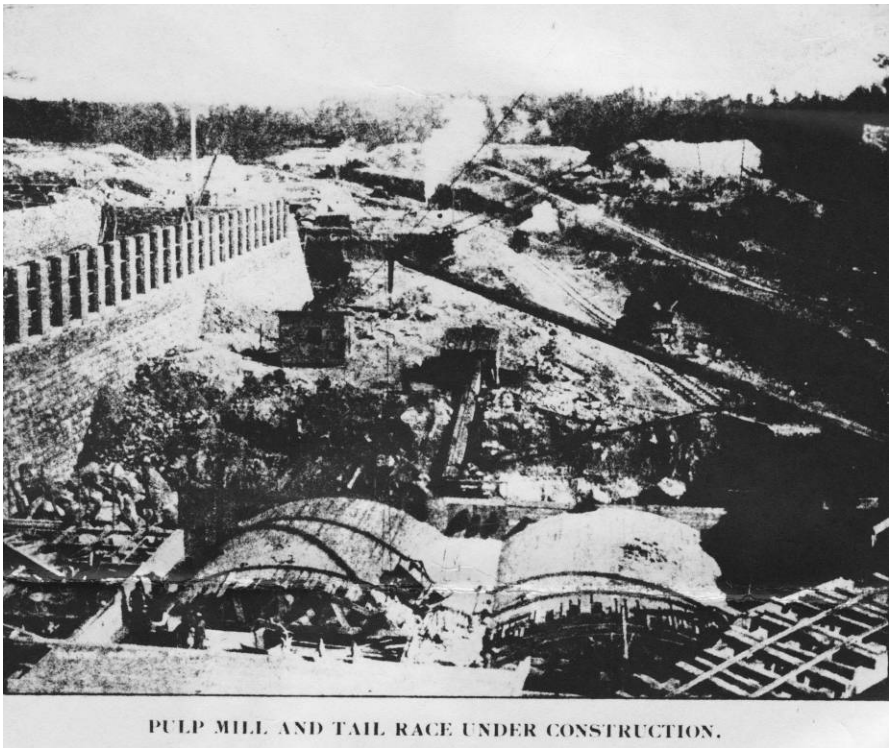
Frank A. Hinds, of Watertown, was the Hydraulic Engineer, and made the plans for the sulfite mill with the advice of Superintendent William H. Decker.

• Adapted from the Watertown Daily Times article, 1901.

John W. Griffin was the supervising Architect for all the mill construction and also designed the houses, the hotel, store and public hall, school house, and all other village structures.

One of the men to whom a large share of the credit is due, not only for the successful starting and operation of the plant after its completion, but for the practically faultless construction, is Superintendent William H. Decker. Many of his ideas, gained through experience and a natural talent for such work, are incorporated in the several structures, all that portion of the construction requiring exactness to make it fully effective having come under his supervision.

The excavation and construction work on the big canal was undertaken by three contracting concerns, and, after the third had failed because of complications not connected with this work, the St. Regis Company completed the canal with Theodore E. Knowlton as Superintendent of the construction. The undertaking then progressed rapidly to completion, Mr. Knowlton living at Deferiet and giving the work his constant attention. Figure 7 shows the mill during construction.



PULP MILL AND TAIL RACE UNDER CONSTRUCTION.

Figure 7. Mill under construction, 1901 (Watertown Daily Times).

The building contractors were: Haley, Ward & Co., Watertown, brick and stone work; Celestine Burns, Watertown, heavy masonry; James T. Campbell, Lowville, bridge, masonry, and slope walls; D.C. West, Lowville, hotel, school house, and stable; Peters & Brown, Watertown, E.D. Sheley and George Helier, Theresa, Charlebois Bros., Watertown, the village houses; Dennis Cavanaugh, mill roofs, doors, and windows. J.C. McNei Boiler Co., Akron, O., built the digesters, and the lining was done by the Non-Antem Sulfite Digester Co., of New York. The roofs were covered by the Warren Chemical and Manufacturing Co. Campbell & Lewis, of Watertown, were the plumbing contractors. The chimney was built by the Alphonse Custodis Chimney Construction Co., of New York.

The concrete pours throughout the entire plant were made by the Watertown Ponite Concrete Company, whose Manager, Henry E. Baker, supervised the concrete construction, and whose work was so accurate that when the belts and ropes were tried on the shafting, every opening was found to be exactly in the right place and correct shape.

Fred C. Anderson was the electrical engineer who wired the houses and other buildings for lighting.

Some Facts and Figures

- Capital invested – Nearly $2,000,000
- Work began January 1899
- Max. water power – 12,000 horses
- Steam power – 2000 horses
- Length of canal – 4400 ft
- Depth of water in canal – 20 ft
- Length of canal – Head race, 4400 ft; tail race, 1300 ft; total, 5700 ft
- Bulkhead at canal entrance – 200 ft
- Second bulkhead – Total height 70 ft; thickness 25 ft
- Height of chimney – 175 ft
- Village residences built – 52
- Construction employees – About 1000
- Land owned by St. Regis Company – At Deferiet, 750 acres; forest lands, 80,000 acres
- Men employed to operate mills – 200

- Force employed in the forest – 700 men and 125 teams about half the year
- Construction cement – 21,500 barrels
- Rail carloads of material plant construction – Nearly 3000
- Capacity of plant – From 100 to 150 tons, or 6 to 10 carloads, a day
- Capacity of sulfite mill – 40 tons
- Capacity of wood pulp mill – 120 tons
- Cost of machinery manufactured in Watertown – About $350,000.

St. Regis Paper Company Administration

Officers

- *President* – George W. Knowlton
- *First Vice President* – William W. Taggart
- *Secretary and Treasurer* – George C. Sherman
- *General Manager* – David M. Anderson.

Directors

- G.W. Knowlton
- J. Henry Dick
- K.B. Fullerton
- F.D. Mollenhauer
- D.M. Anderson
- G.E. Dodge
- Alvah Miller
- A.C. Scrimgeour
- G.C. Sherman.

The St. Regis Mills Force[•]

- William H. Decker, Superintendent
- Wm. Falvey, foreman in charge of canal work until completed
- T.J. McManus, walking boss
- Peter Bigham, inspector of buildings
- Wm. Doyle, yard and track foreman

[•] Adapted from Watertown Daily Times article, 1901.

- Wm. Thompson, George S. McKenny, day and night paper machine foremen
- Wm. Rivers, foreman of sulfite mill
- Charles Austin, M. FitzGerald, tour bosses in ground wood mill
- Hugh O'Connor, boss piper
- George Chamberlain, foreman of painters
- J.D. Baldick, master mechanic
- J.S. Shaver, in charge of cooking sulfite pulp
- Fred Reece, A.K. Bradley, boss firemen
- George Soper, John Newcomb, beater engineers
- Joseph Goldthrite, yard master
- Daniel Shanahan, engineer of switching engine
- Fred Munger, boss blacksmith
- Amos G. Howland, foreman of finishing room
- E.J. Sweeney, Patrick Keeney, tour foremen beater room
- R.T. Bacher, time keeper
- Fred Tears, William Olmstead, office men
- Charles Gazin, mill store keeper
- Herbert Parker, assistant mill store keeper
- H.J. Snook, chief clerk.

From Standing Timber to Finished Paper

At the beginning, the paper mill was one entity by itself, the wood pulp mill was another and the sulfite pulp mill was unknown; however, the design and construction of the mill at Deferiet, all three processes were brought together. The mill was a most impressive illustration of a group of massive structures for the making of sulfite and wood pulp and for turning out the finished paper ready for market are all produced in one area. Large tracts of forest land from which the supply of pulp wood is annually harvested are owned by the same company as well.

A paper mill is a factory devoted to making paper from wood pulp and other ingredients using a Fourdrinier Machine or similar apparatus.

Pulp Preparations[•]

Tree trunks are cut into logs and put into a large drum barker to remove the bark. The logs rub against each other and the side of the drum, saving most of the wood. Drum barkers are intended for uses where the pulp will be bleached and where clean pulp is not essential as all of the inner bark will not be removed. Logs are inspected and any remaining bark around knots or in cracks is removed by machines or by hand with an ax. After the bark has been removed, the logs go into the chipper where chips may range in size from ½ to 1- ¼-in. in length, depending on cooking method and wood type. The chips are then cooked to an optimal moisture content of roughly 30 to 40 percent. The cooking method can either be a sulfite process or a sulfate, or kraft, process. The sulfite process uses a solution of sulfurous acid (like lime) to treat the wood. The sulfate process is an alkaline process, where the alkali is replaced by sodium sulfate.

After cooking, the chips are mechanically handled to remove dirt, knots, and uncooked chips. The chips are then forced into a refiner where they are forced between steel plates and the resulting fibers are brown in color. Chlorine is then used to bleach the brown fibers to be a brighter white color. Hypochlorites may also be used to whiten the fibers. Caustic soda along with chlorine is used to wash the pulp of impurities and also contributes to bleaching.

Sulfite Process•

The sulfite process separates the cellulose fibers from the wood by dissolving the lignin in large containers known as digesters. The liquid solution in the sulfite process involves passing the gas of sulfurous acid (SO_2) through water (H_2O) to create a bisulfite with excess sulfurous acid (H_2SO_3).

C.D. Ekman started the first sulfite mill in Sweden in 1873 and used magnesium bisulfite as the main cooking agent. Ekman's German rival, A. Mitscherlich, created a similar process, but used calcium bisulphite because it had a cheap base of lime. Sulfite pulp was by far the most popular and rag pulp was reserved only for bank notes and archive purposes. In 1938, more paper was made by the kraft process than any other process

[•] Rudin 1990 and Sutermeister 1941.

[•] Rudin 1990 and Sutermeister 1941.

and the kraft process soon gained even greater popularity throughout the 1940s. Because the kraft process uses alkaline liquors, which penetrate the wood faster than acid, longer wood chips may be used than in the sulfite process. These longer wood chips mean that less power is required to run the chipper and the longer chips are inherently stronger than shorter ones, resulting in stronger pulp in the kraft process. The primary byproduct of waste liquor is the calcium salt of lignosulfonic acid and can be used in products such as concrete and drywall.

The pulping liquor in most sulfite mills is created by burning sulfur or iron pyrites to create sulfur dioxide, with sulfur being the more common process. The gas is then passed through pipes into a cooling chamber that allows water to pass over the pipes and the gas forms into sulfurous acid. Byproducts of this process can have a variety of uses. The liquor can be adhesive and (used in conjunction with clay and a preservative) can be used to adhere linoleum to floors. Lignosulfates are another byproduct and can be used in the tanning of leather or in making concrete and drywall. Vanillin (artificial vanilla) was often separated by steam distillation, but is no longer used. One of the most popular uses of the waste liquor is to ferment it (along with other detailed processes) to create ethanol. In 1930, nearly 16 million liters (out of a possible 20 million liters) of waste sulfite liquor in Sweden was used to produce alcohol.

Overall

The hydro-plant building constructed over the tailrace, which is a spur off of the Black River, separates the groundwood mill, associated buildings, and storehouse, located to the south, and the sulfite mill, associated buildings and machine area, located to the north (Figure 8). At the base of the sulfite mill, the other buildings were spaced so that the product of the sulfite mill traveled by gravity from point to point as the process of pulp-making progressed to its union with the process of paper-making. Provision was made against a failure of supply of pulp wood by two methods of transportation, one by rail, the other by the log drives and the booms in the river. Figure 9 shows a bird's eye view of Deferiet, NY.

The mill storehouse was a long, narrow, separate building, placed a short distance from the others, just south of the groundwood mill buildings (Figure 10). However, this building is no longer intact. There was also a machine

shop for the repair of parts of the mill machinery, which could be done on the spot, thus making a great saving in valuable time (Figure 11).

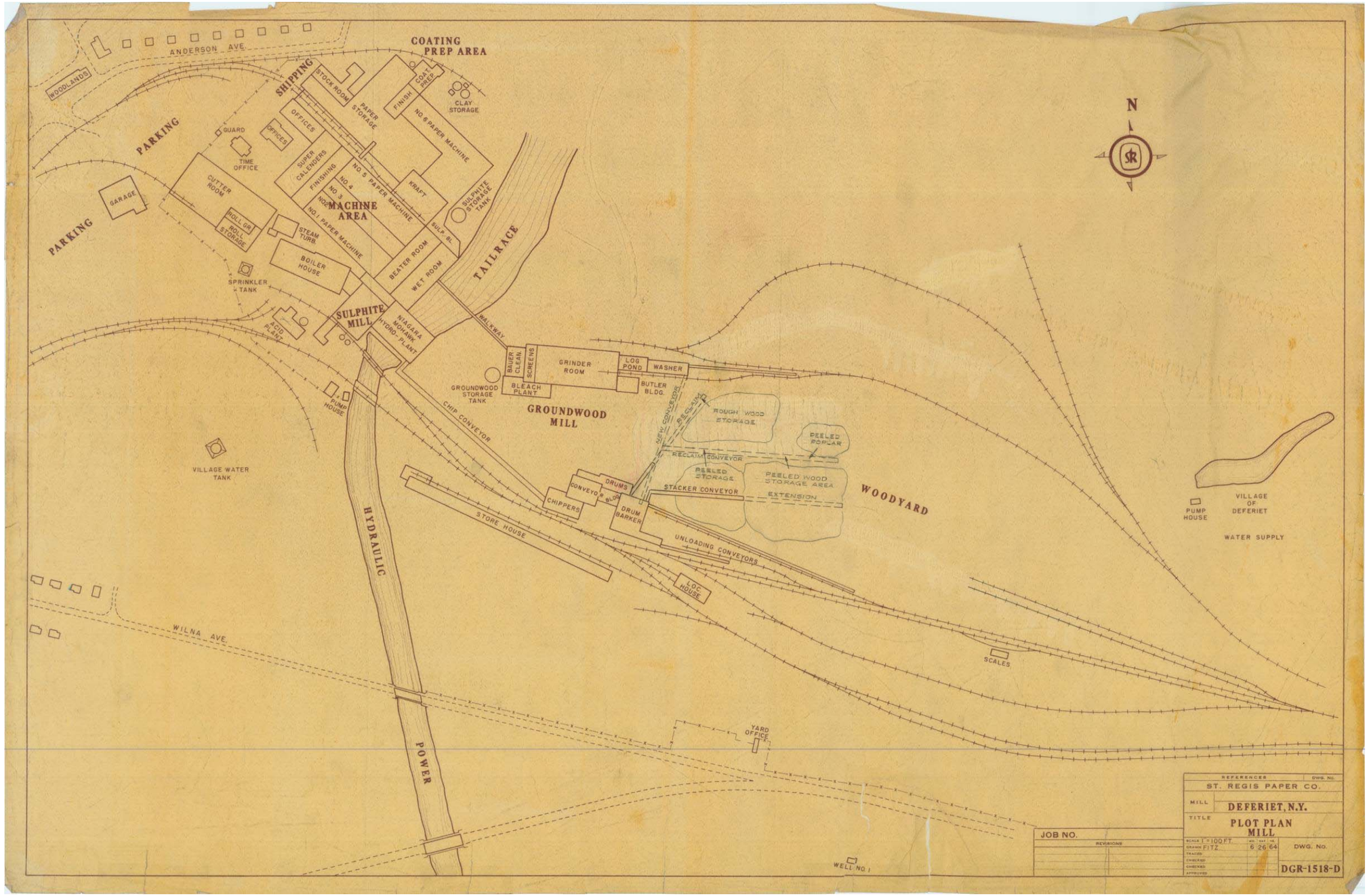


Figure 8. Plot Plan Mill (1964).

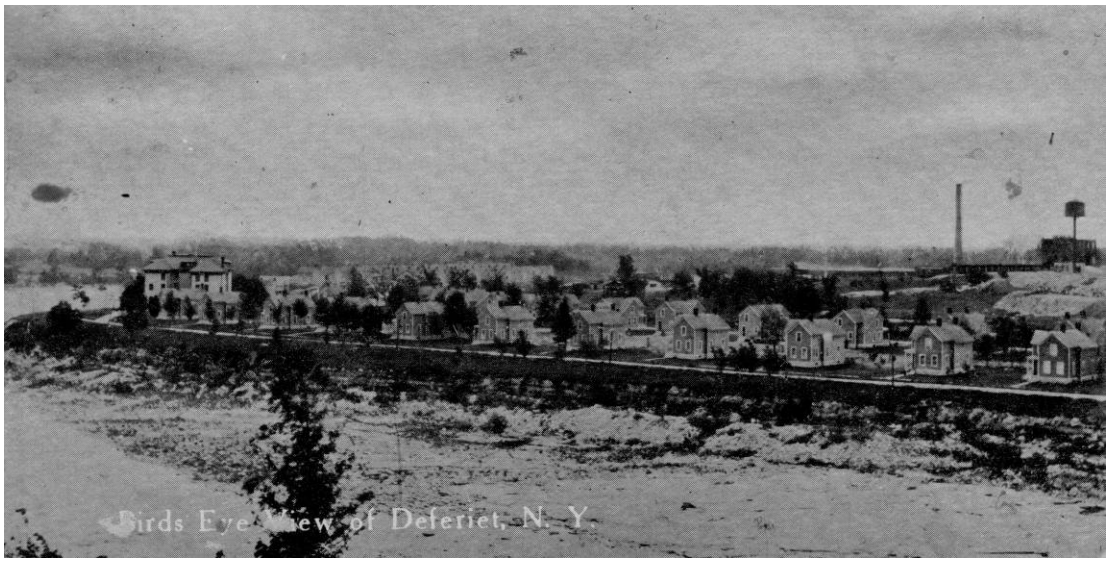


Figure 9. Post card birds-eye view of Deferiet, NY.

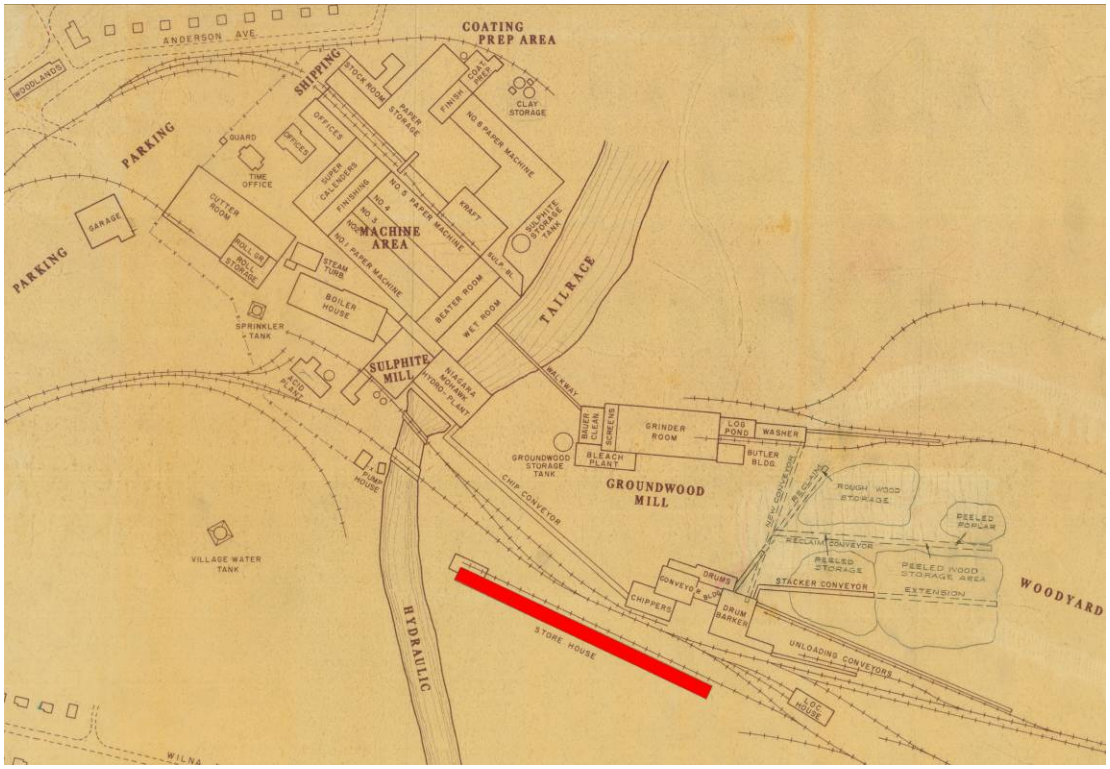


Figure 10. Mill Plot Plan with storehouse location in red (1964).

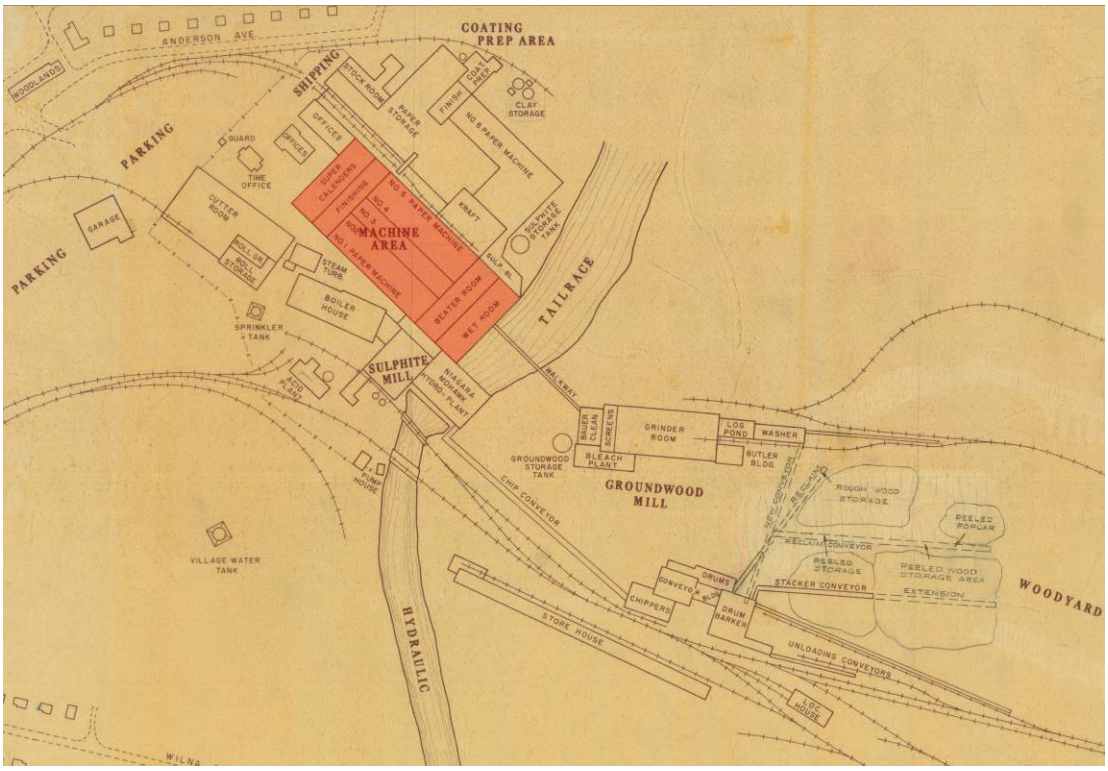


Figure 11. Mill Plot Plan with machine area highlighted in red (1964).

Originally, an electric lighting plant was part of the auxiliary equipment of the mills. There were three 500-light generating machines, with interchangeable power, being belted to run either by water power or steam. The power for the machine shop, elevators, and the ventilating fans was also located here. The entire plant was also provided with the most modern system (of that time) of heating and ventilation, installed by the Boston Blower Company, the same steam that provided power being used in heating in cold weather and the blower apparatus being used in hot weather to circulate cool air throughout the buildings.

Building Materials

The majority of the original mill construction was done out of structural concrete. However, the mill has continuously grown and evolved. As new processes were developed and needs identified, mill buildings were constructed and/or modified. The extant mill buildings are composed of a wide variety of materials including brick, concrete, concrete block, metal siding, stucco, and wood.

Paper Mill Buildings•

Sulfite Mill

The site is most advantageous for the operation of the group of mills in connection with each other. The sulfite mill (Figures 12–19) was set on the summit of a hill considerably above the level of the other buildings, rising like a tower, with its huge absorbing and storage tanks, its sulphur room and other equipment, all on an immense scale. The sulphur was dropped from the cars into the bins where it was stored. The drawings provided below are signed by Frank A. Hinds, C.E. No further information was found on him.

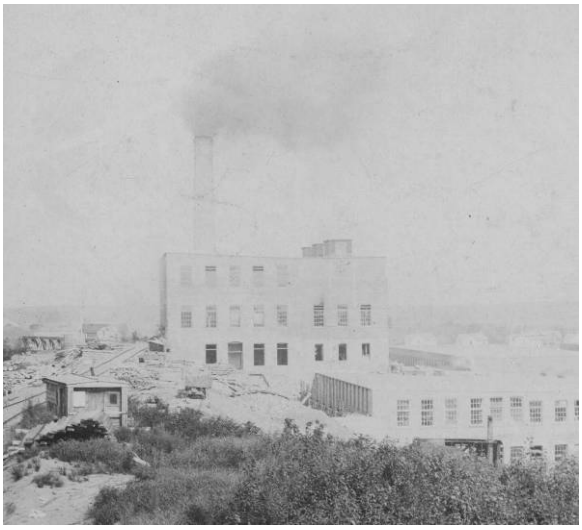


Figure 12. Photo zoom sulfite mill (undated, source: Watertown Daily Times).

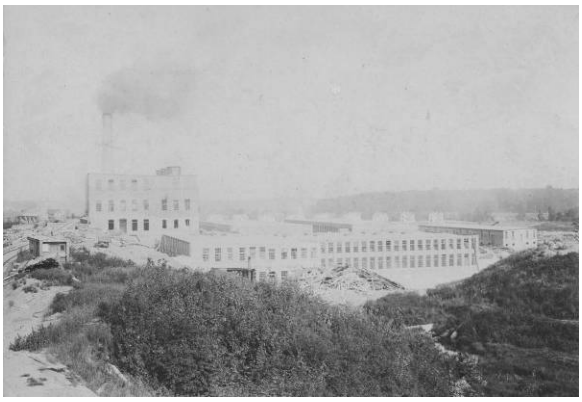


Figure 13. Photo birds eye view (undated, source: Watertown Daily Times).

• Adapted from the Watertown Daily Times, 1901.

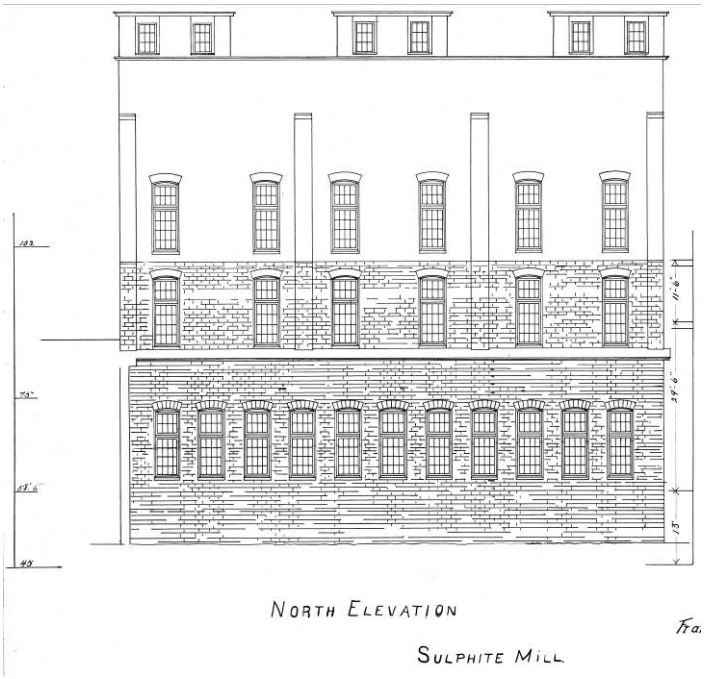


Figure 14. North elevation of the sulfite mill (undated).

Figure 15. South elevation of the sulfite mill (undated).

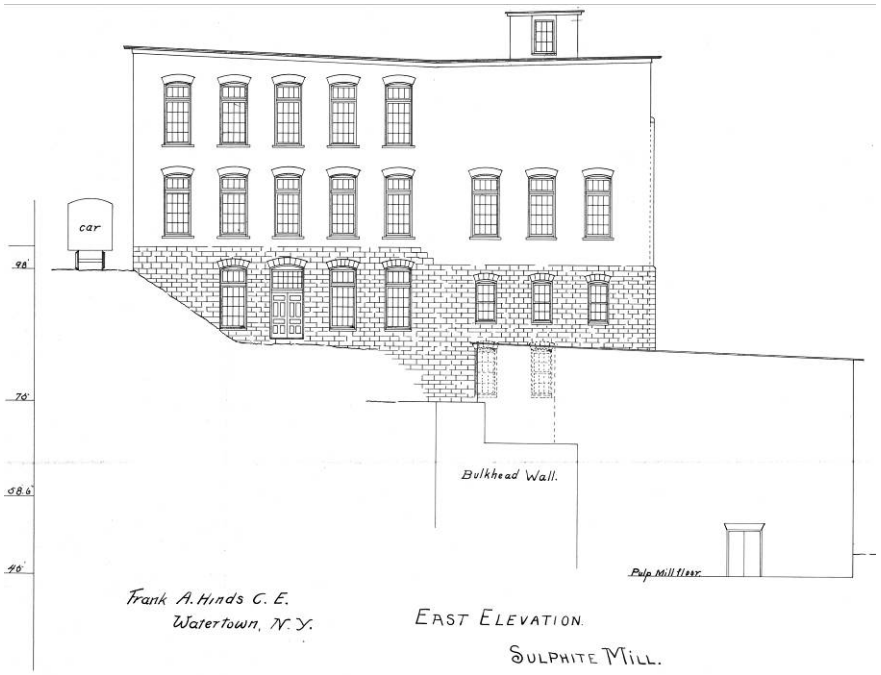


Figure 16. East elevation of the sulfite mill (undated).

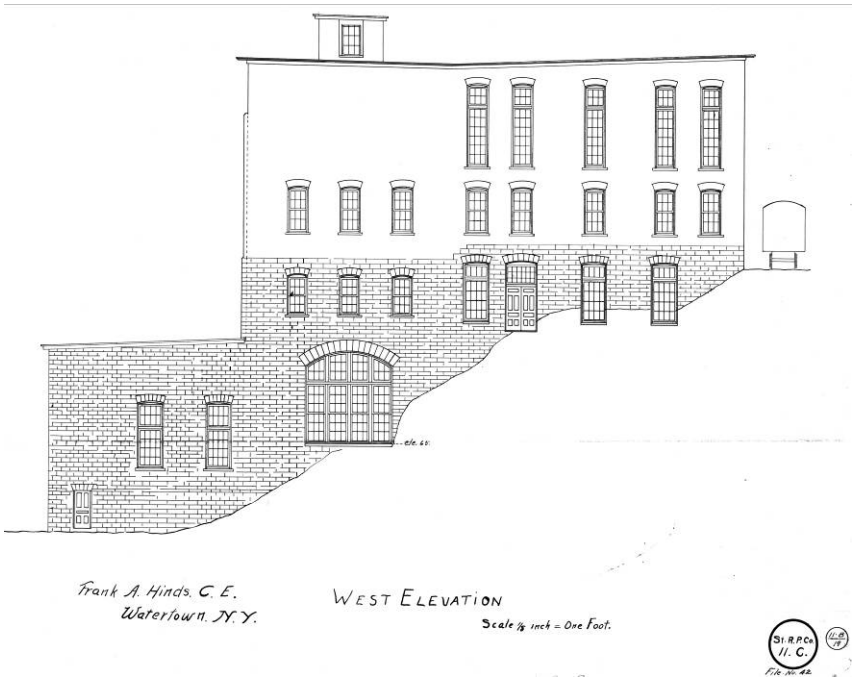


Figure 17. West elevation of sulfite mill (undated).

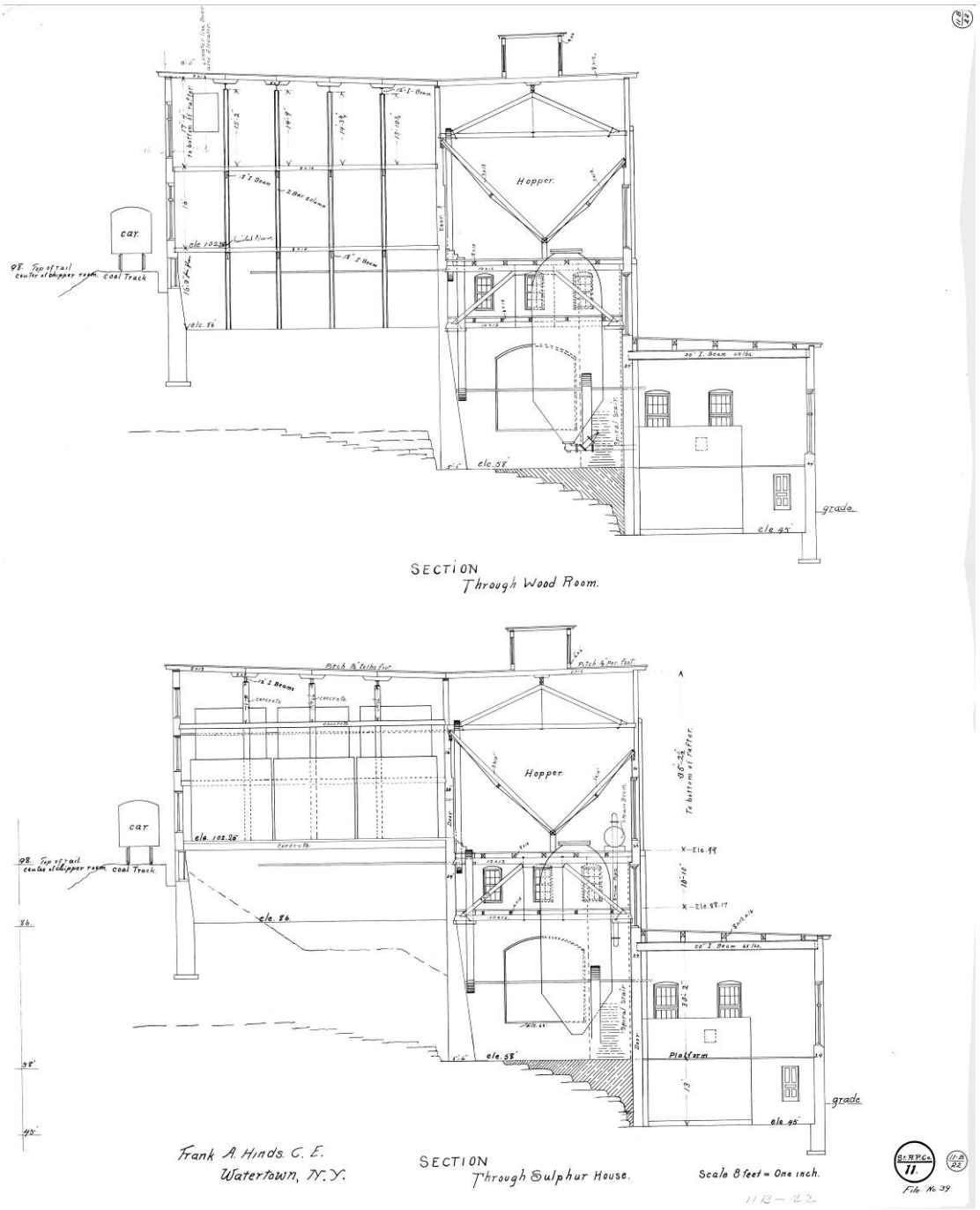


Figure 18. Sections through the wood room of the sulfite mill (undated).

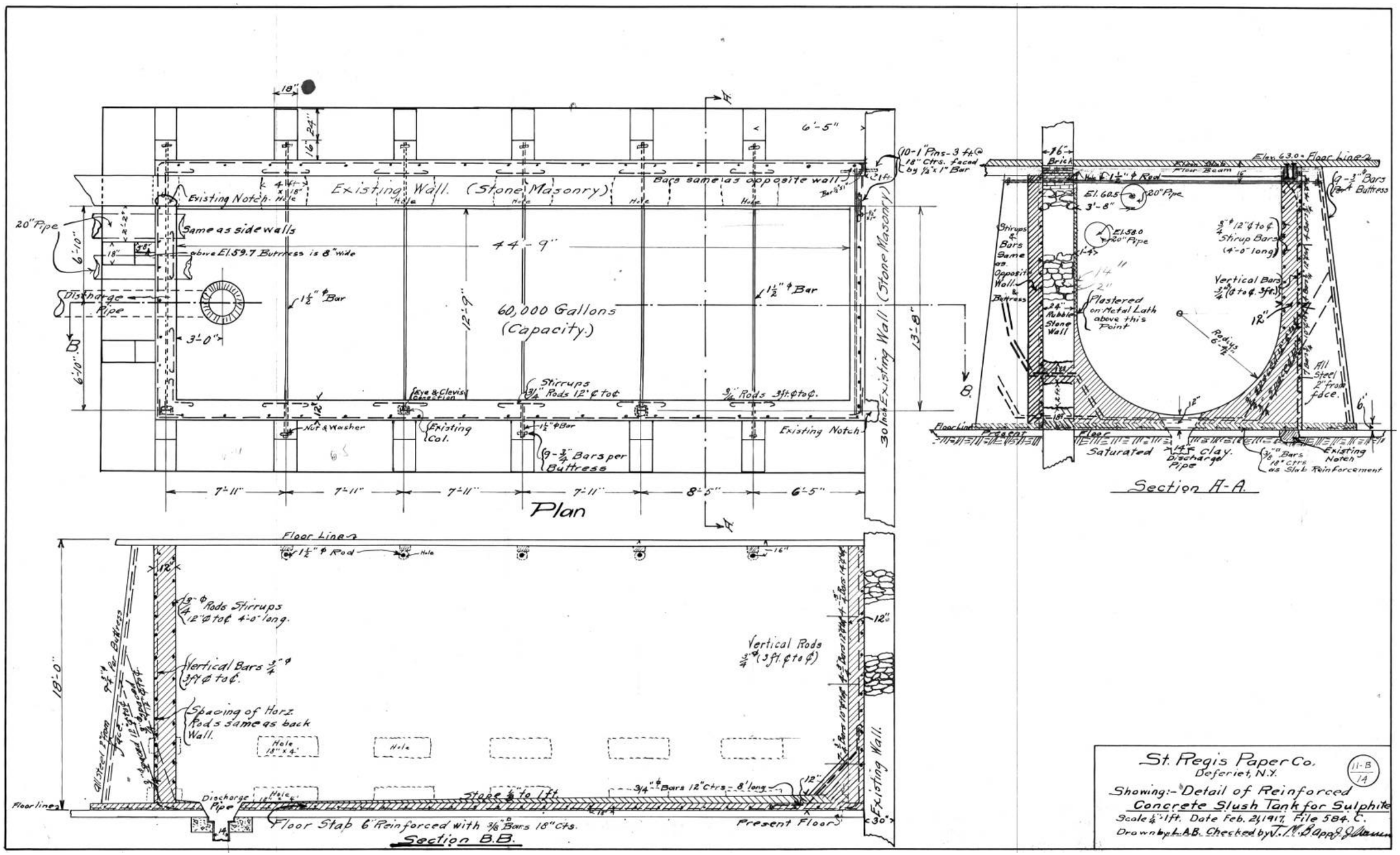


Figure 19. Plan and sections of the slush tank for the sulfite mill (undated).

The groundwood mill (Figures 20, 21, and 22) is located south of the sulfite mill. The logs would be brought by rail to the unloading conveyors. Here the wood would pass through the chipper and the screen, and another carrier would take it to the hopper, which was 75 ft long and 30 ft high. From the hopper, it would pass into the huge boilers, or digesters, 40 ft deep and 14 ft in diameter, which were lined with acid proof brick and lead. The sulphurous acid dissolved the wood into fiber and removed the impurities here.

There were 25 ponderous grinders manufactured and installed by the Bagley & Sewall Company in the machine area (Figure 23). Above each machine was a traveling crane capable of carrying over 5 tons. In the power house, in which the grinders were located, there were six pairs of 39-in. wheels, each pair developing 1800-hp under a 48-ft head.

In the screen room were long rows of screens, 75 in all, the product of the Brownville Iron Works.

Machine Area

In the wet machine room, there were 25 wet machines and eight Decker feltless machines. This room was equipped with the Hunt industrial railroad on which, by a system of switches, the trucks loaded with pulp were run to the machines in every direction without interfering with or delaying those returning for new loads. The tracks were sunk in the concrete and there are track scales on which the weight of the loads was ascertained.

The beater room (Figure 24) was also equipped with the industrial railroad and with eight mammoth beaters and four Jordan engines. In the basement under the wet machine room was a great chest, 36 x 60 ft and 12 ft in depth, which was used for the storage of the surplus pulp until it was needed later.

The basements under the paper machine rooms give an idea of the immensity and weight of the machines, and of that portion of the mill structure, as it was studded by massive concrete pillars 18 ft high. The pillars were set on the solid rock and supported the concrete floors, which held massive papermaking machines.

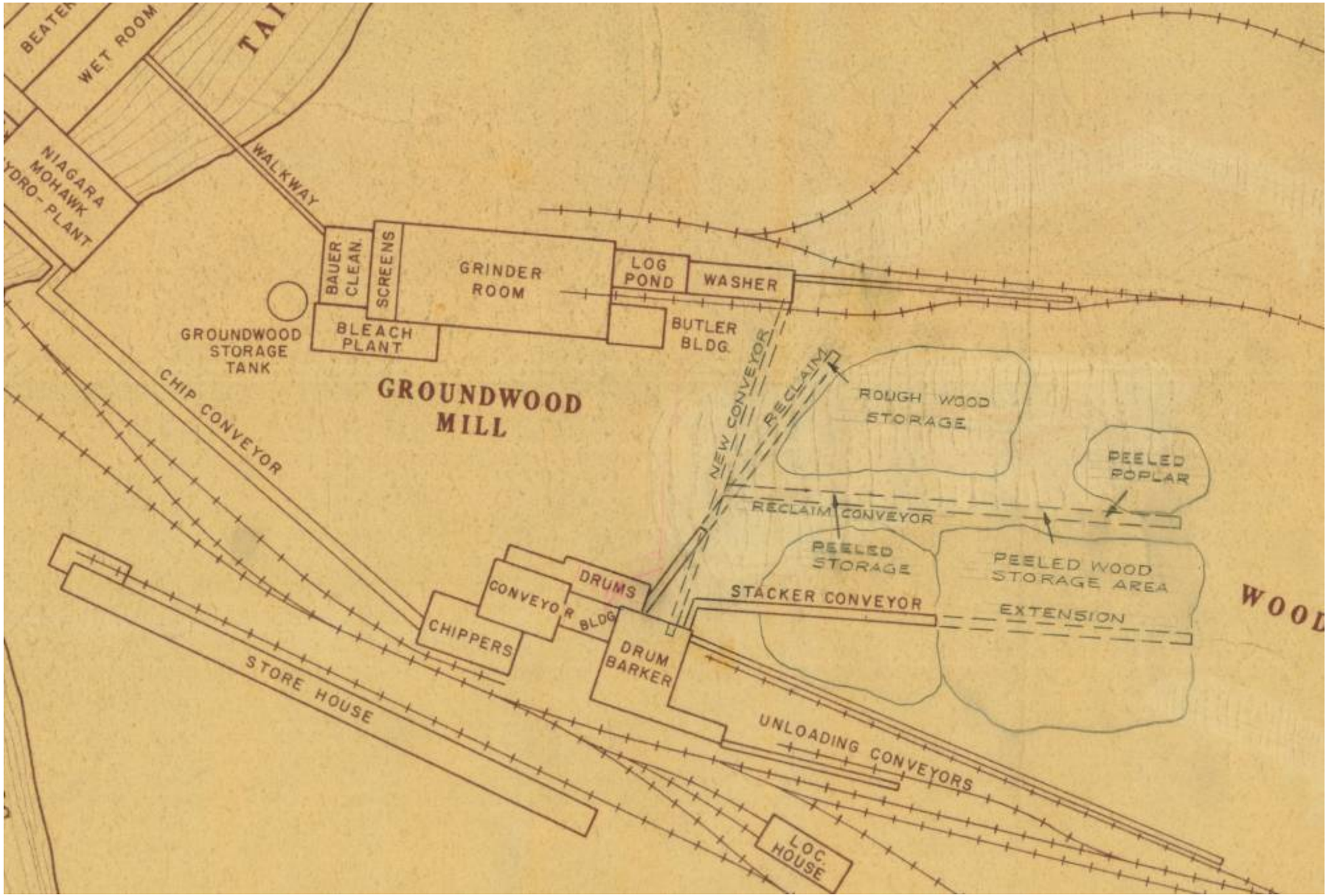


Figure 20. Enlarged view of the groundwood mill area and associated buildings (1964).

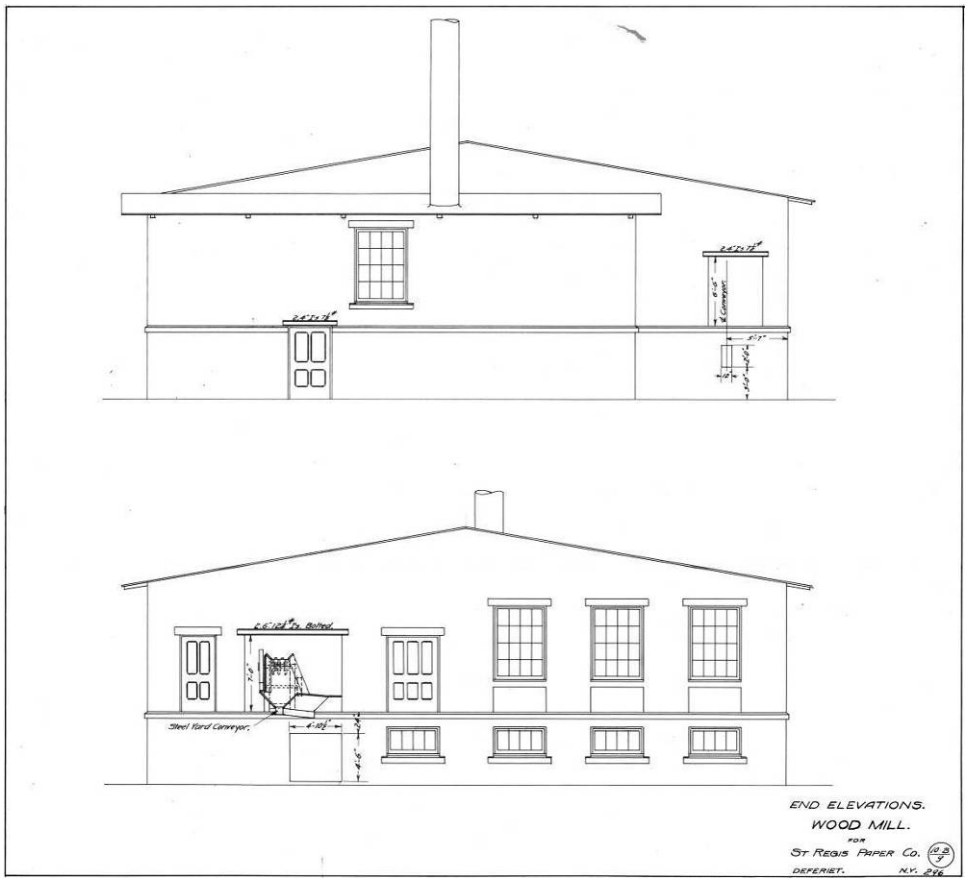


Figure 21. End elevations of the wood mill (undated).

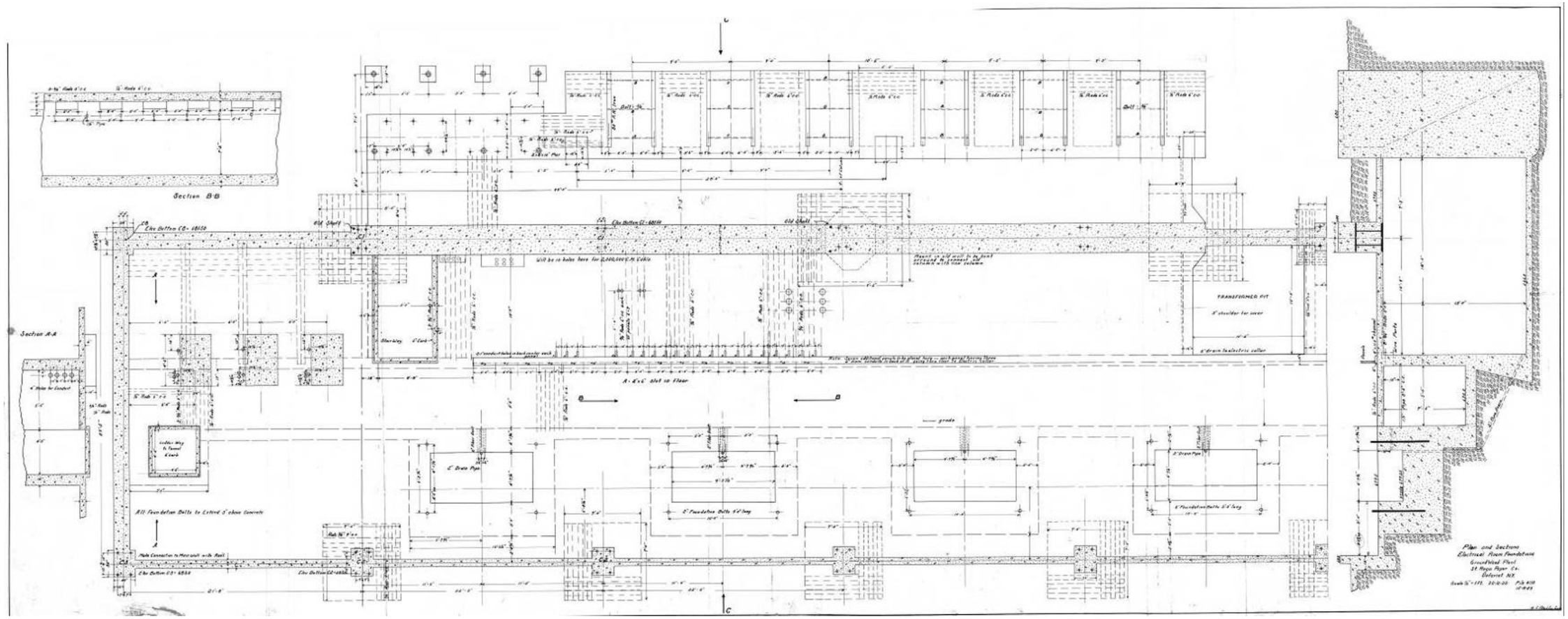


Figure 22. Section through the electrical room at the groundwood mill (undated).

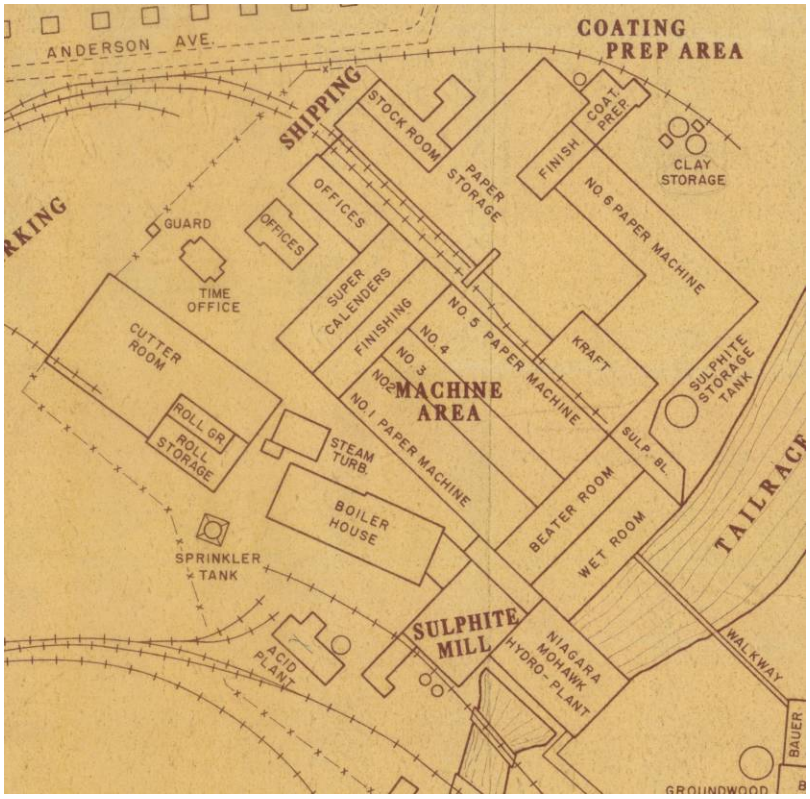


Figure 23. Enlarged view of the machine area and associated buildings (1964).

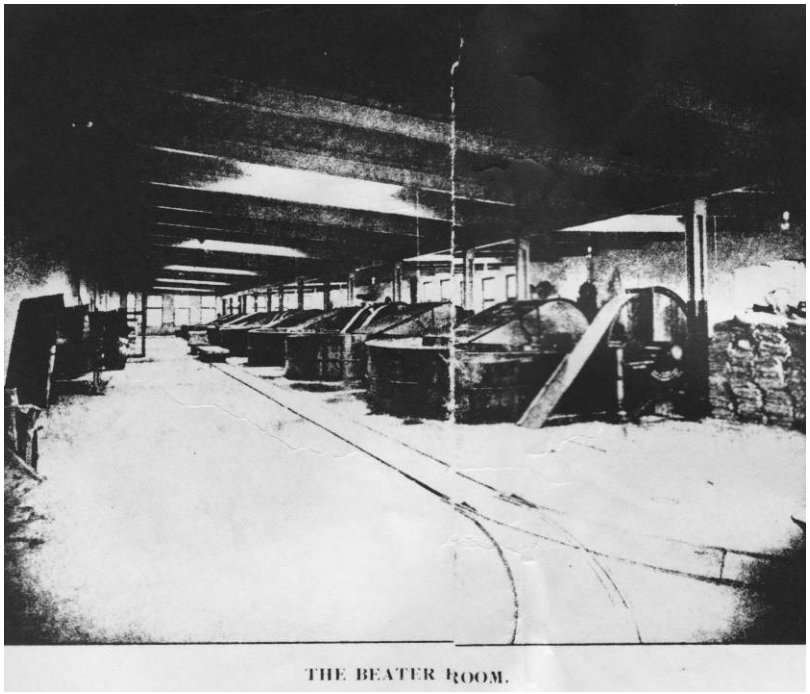


Figure 24. The beater room (1901, source: Watertown Daily Times).

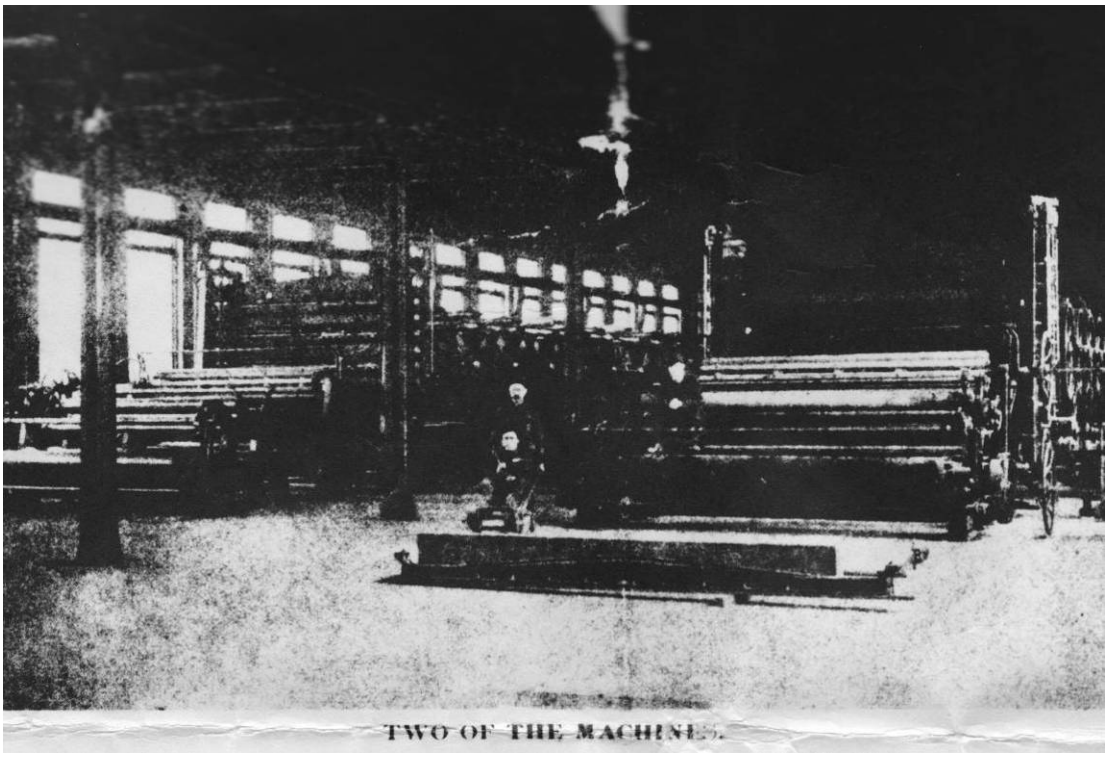


Figure 25. Two of the paper machines (1901, source: Watertown Daily Times).

Originally, there were two vast spaces called the north and south machine rooms. In the north room were two machines, on one of which a sheet of paper 145 in. wide could be made and on the other a 126-sheet. In the south room there were two more machines, one capable of making a 110-in. sheet and the other a 90-in. sheet. The paper machines (Figure 25) were originally a Watertown product, having been manufactured by the Bagley & Sewall Co. Over each machine was a hood designed by Superintendent Decker. There was also a crane over the machines, which was used for the erection of the machine and was made a permanent fixture for use in handling parts of the machinery when repairs were needed.

An excellent record was made by Superintendent Decker when the biggest machine was started. He made the first paper on it, a sheet 138- in. wide, at the rate of 350 feet per minute (fpm), a very unusual speed for starting a machine that size. Twelve years previously, the fastest run was 250 ft a minute.

A larger machine building was constructed shortly after World War II. This building housed a No. 6 paper machine. Also a supercalender department was added with two supercalenders.

The shipping room adjoined the machine room. There, the product was loaded directly into the cars, with a railroad track extending along each side of the building.

Boiler Building

The original boiler building stood (and still stands) north of the sulfite mill at the foot of the slope along the summit of which a railroad ran and from which point the coal cars dumped their loads into a chute. The coal slid down to 20 large boilers. The boilers were grouped into batteries of five, representing a capacity of 100-horse power each, or 2000 horse power altogether. The steam was carried to various locations of the mill through 12-in. pipes.

This building was designed by Engineer Frank A. Hinds and was a fine model for such a function of the time. The boilers themselves were manufactured by the Watertown Engine Company.

In the big engine room were four very large engines, each of 300-horse capacity, erected by the Watertown Engine Company.

The chimney was built of radial brick and was one of the first of this style of chimneys to be erected in this country as the builder had recently come from Germany and established a business in America.

The Village of Deferiet•

This Village of Deferiet (Figure 26) lies in the Town of Wilna in Jefferson County, NY. The area was first settled in 1806 and the village was named after Madam Deferiet, originally from France, who sold the land the village stands on to David Reynolds for his farm. Later it was sold to the St. Regis company when it planned on building a paper mill there. Previously there had been nothing on the property but the Reynolds farm and a bridge over the Black River.

• Adapted from www.usacitiesonline.com/nycountydeferiet.htm

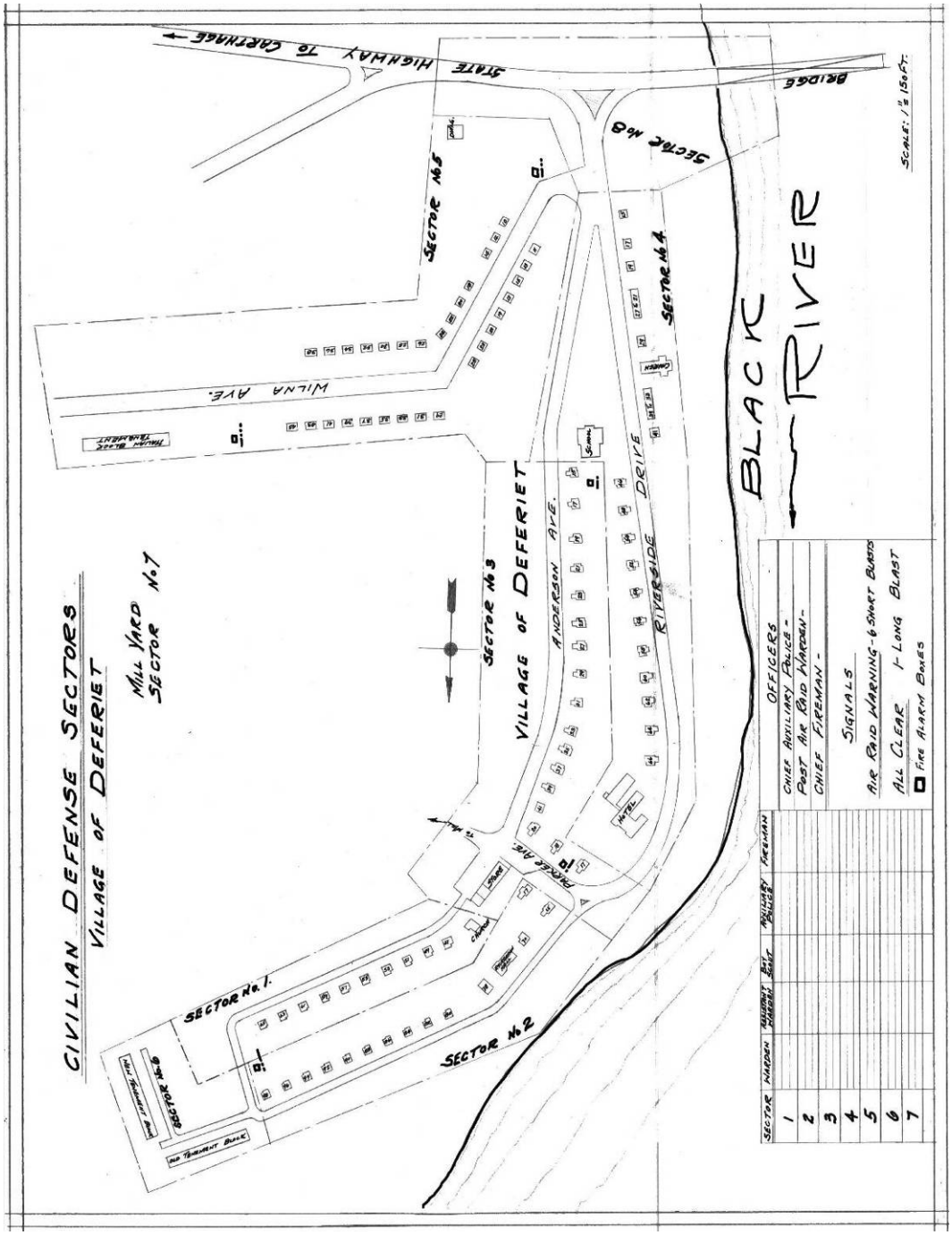


Figure 26. Village of Deferiet.

Most of the first residents however, were immigrants directly from Italy and Poland. The land and village were developed by a group of men from Watertown, NY who designed a village centered around a paper mill. This was the very first St. Regis Paper Mill.

The village is a man-made island, constructed with a canal connecting from and to the Black river. The canal was constructed by a dam, which would direct water to the canal and paper mill, which has a second dam with hydro electric generators that turned the rushing water into electricity. At the start-up of construction, two apartment buildings were built at separate ends of the village. One was inhabited by Italian families and the other primarily Polish. Every house in the village was built by the St. Regis Company and was leased to an employee at a moderate rental.

The crescent-shaped plot plan of the village is located just outside and to the south and west of the entrance into the paper mill. The manager's house was located at the southern point of the village. A large triangular-shaped public area was laid out in front of the two-story school house. Two rows of well built homes with their cozy rooms and all modern conveniences including electric lights, bath rooms, and a water supply are located north of the school. A large hotel and general store are located just outside of the main gates to the mill.

Ten houses were constructed south across the State highway 3A.

A Whole School District

A two-story spacious and attractive school building (Figure 27) was constructed by the St. Regis Company at a cost of $10,000 within the first few years of the mill opening. The large two-story school house was located near the entrance into the village. A triangular-shaped open lot allows the school has to be a prominent visual structure in the village (Figure 28). At an unknown date, a large addition was constructed on the back side of the school house (Figure 29).

Figure 27. Post card, school (undated).

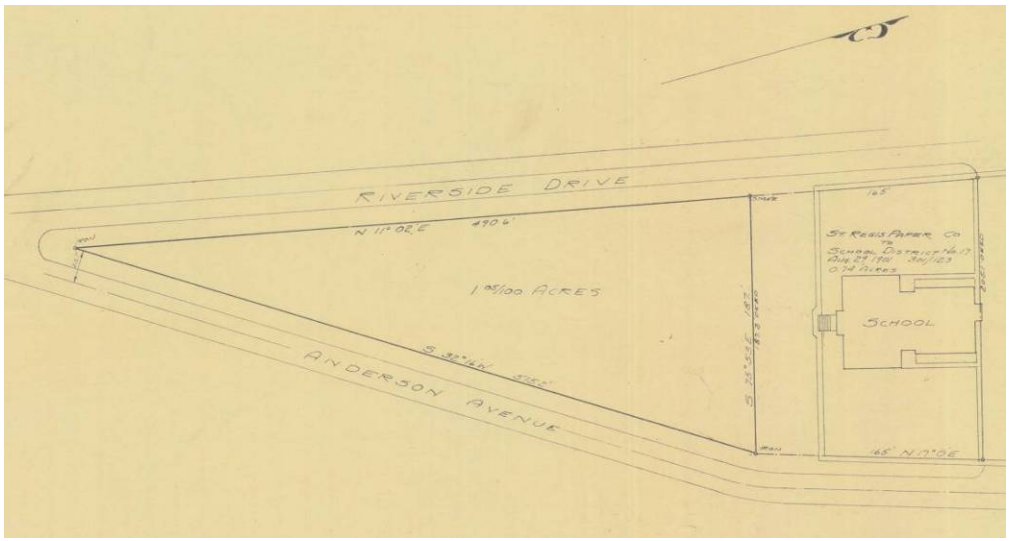


Figure 28. School Triangle (1954, cropped).

Figure 29. School house addition on the right side of the drawing (undated).

Figure 30. Postcard, store oblique (undated, source: Watertown Daily Times).

The Deferiet General Store

The village general store (Figures 30–32), which was really larger and more conveniently planned than many city stores of that time, was operated by the St. Regis Company. The first proprietor was M.M. Parker, a well-known and progressive merchant who had successfully conducted a store at Felts Mills for several years prior and was familiar with the requirements of such a place.

Development

The general store (Figure 31), constructed in 1922, supported the residents and the workers of both the Village and the Mill; however, the original size of the store was inadequate for the numerous functions the building held. In 1923, an addition, which was used as a general store, was constructed on the north elevation, nearly doubling its square footage (Figures 32–34). The original store portion was used as a community hall.

Figure 31. Postcard, store front facade (undated).

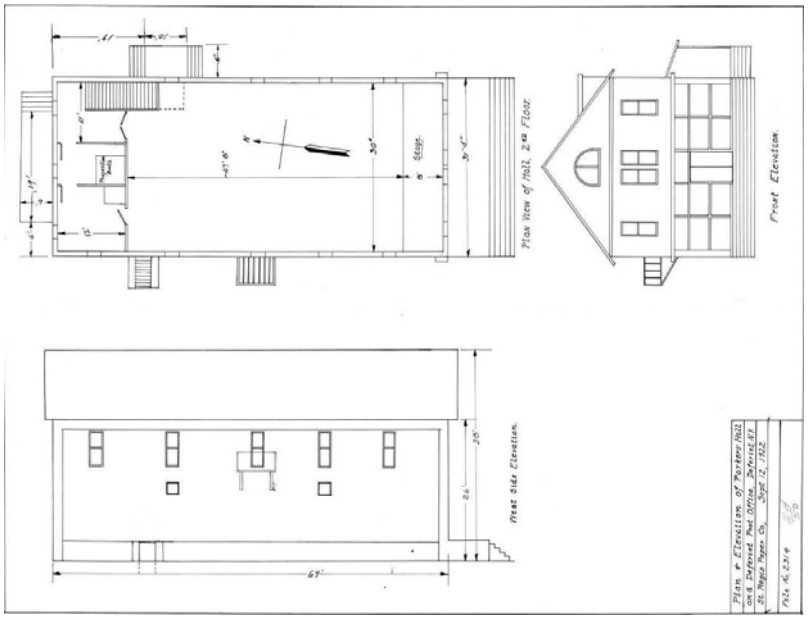


Figure 32. Original second floor plan and front and west elevations of Parker's Hall.

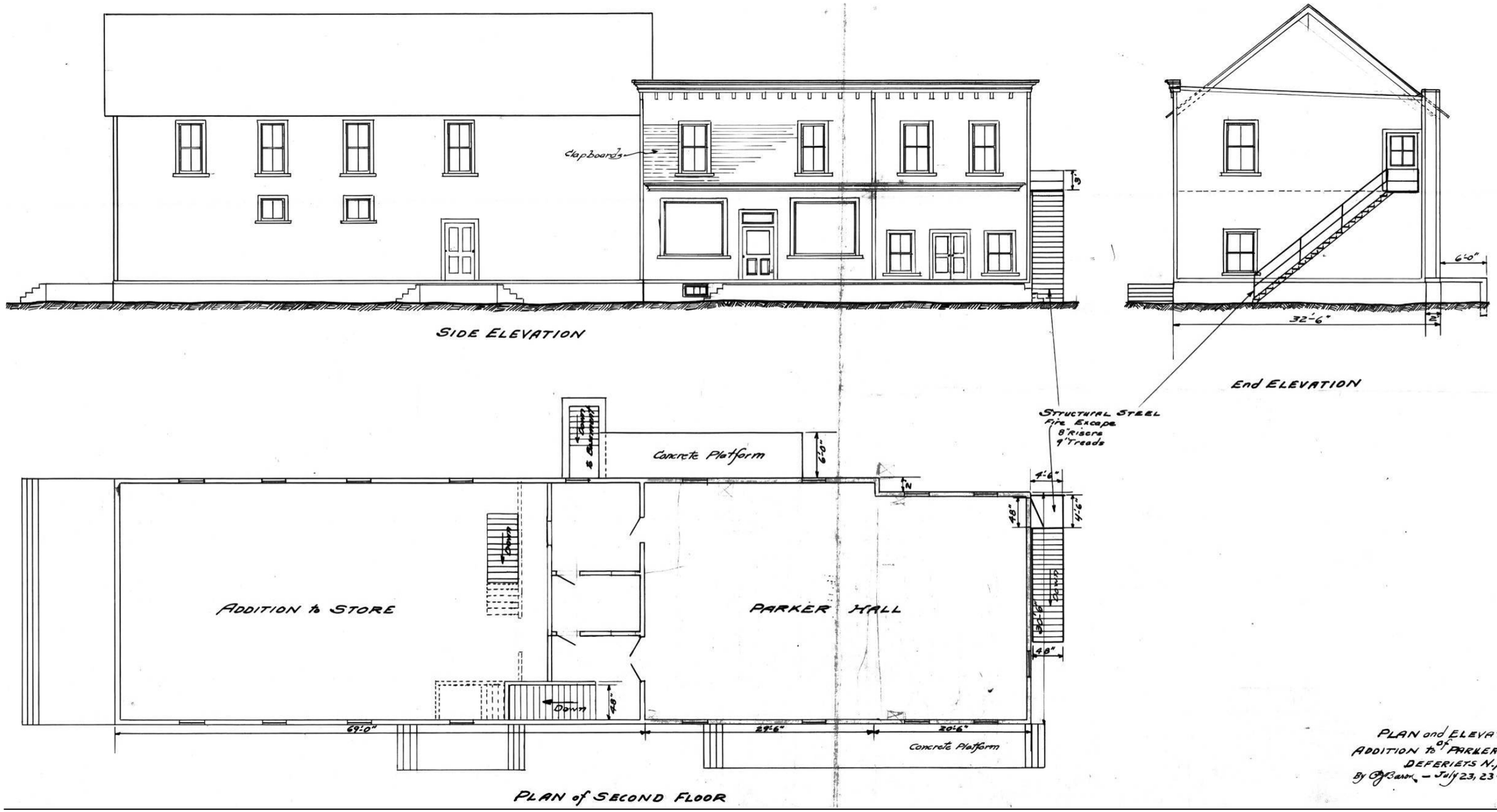


Figure 33. Addition floor plan and side and end elevations of Parker's Hall and store addition.

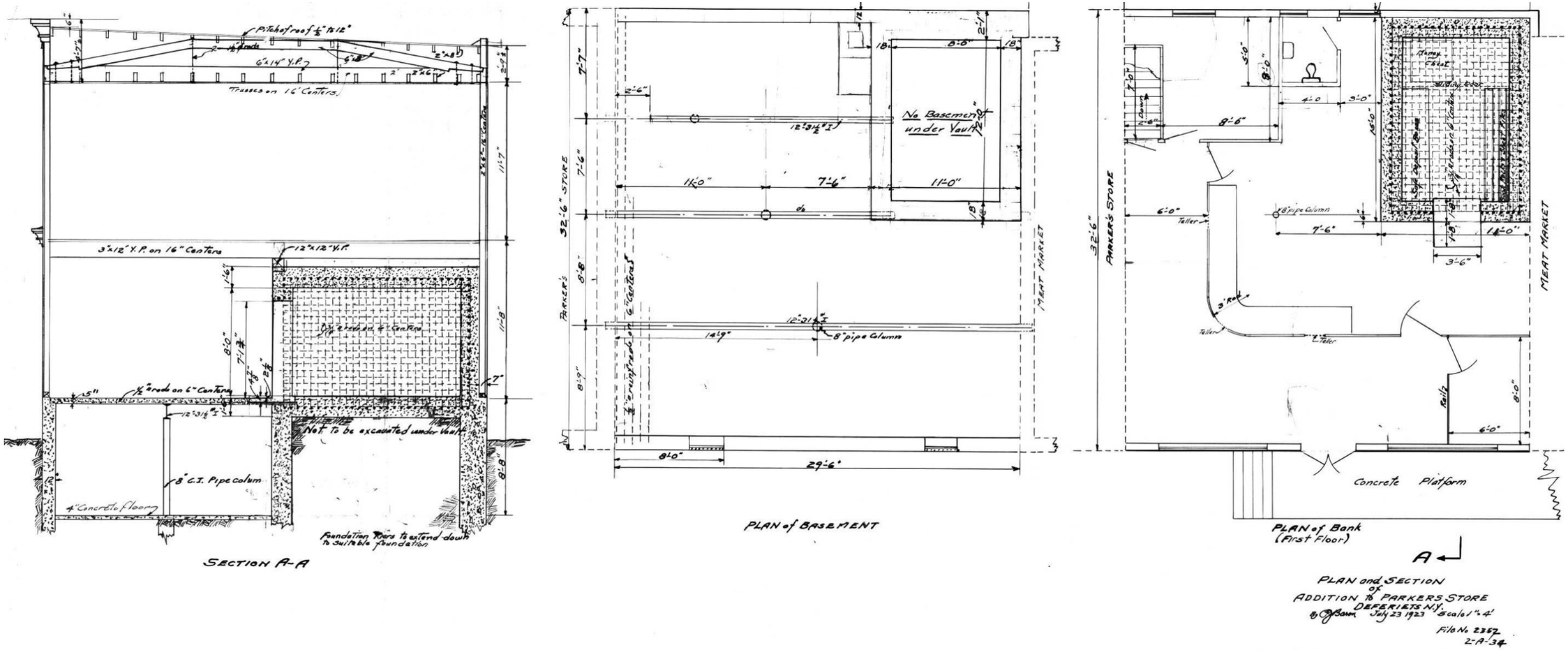


Figure 34. Basement floor plan, bank floor plan, and section through the Parker's Store addition.

Hotel – St. Regis Inn

The hotel (Figures 35–38) was a model structure of its kind at the time, with an attractive exterior and an appearance of cheerfulness and comfort within. It had a broad veranda on the front and street sides, and was set in a small park offering fine views, including an enticing glimpse of the river in the foreground.

The reading room within the hotel had a fireplace of generous dimensions and the office, dining room, billiard room, barber shop, and other apartments on the first floor were spacious, well-lighted, and most conveniently arranged. There were a total of 40 original sleeping rooms as well as a number of bath rooms and closets.

Figure 35. St. Regis Inn (1901).

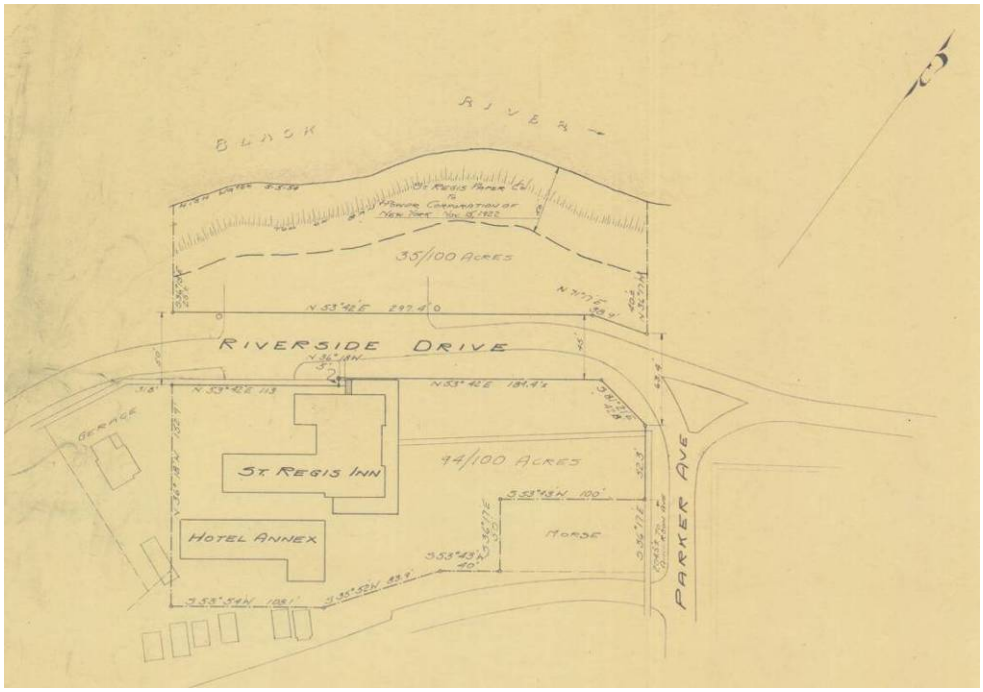


Figure 36. St. Regis Inn parcel (1954, cropped).

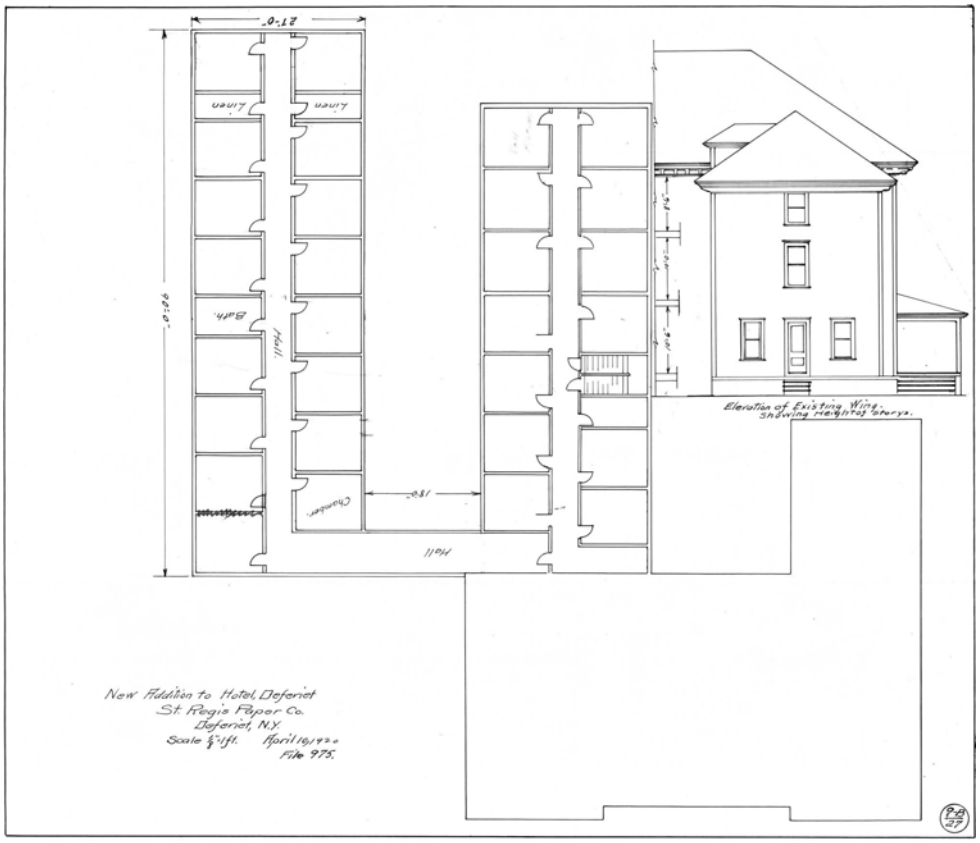


Figure 37. Addition floor plan and elevation of the hotel.

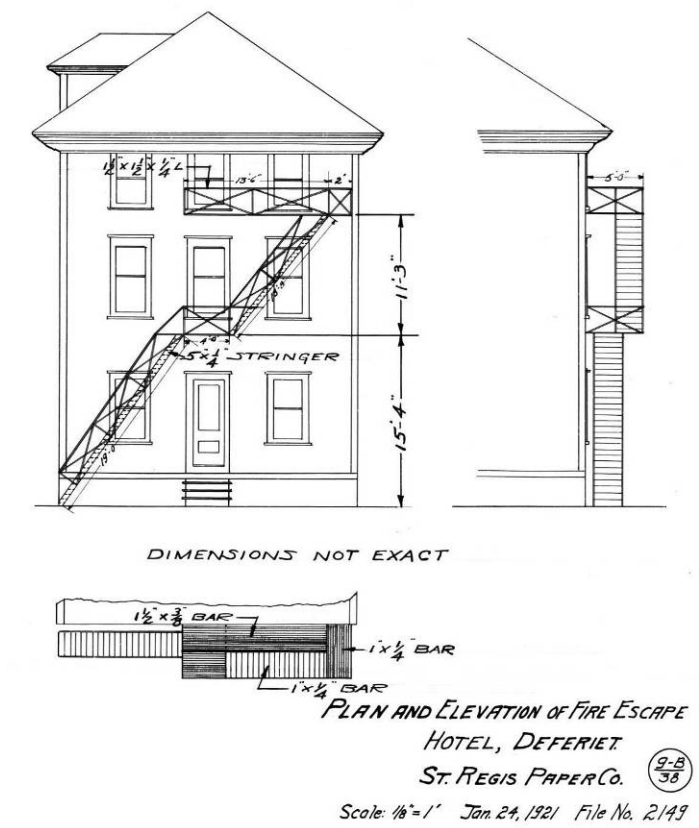
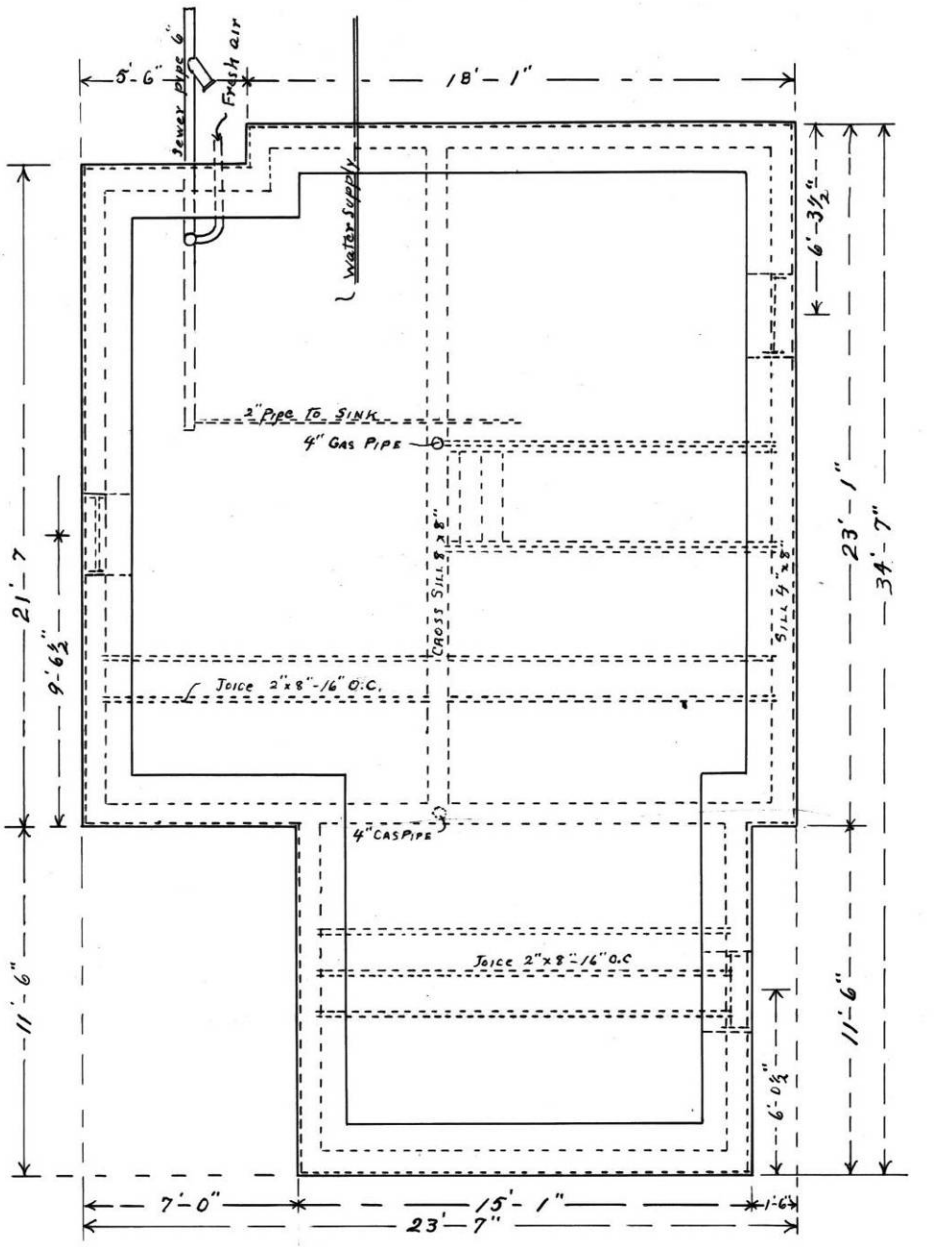


Figure 38. Plan and elevations of the fire escape for the hotel.

Dwellings

Figure 39. Postcard of houses in Deferiet (undated).



CELLAR PLAN
OF
DWELLING HOUSE
FOR
THE ST. REGIS PAPER Co
Scale ¼"=1'
J.W. GRIFFIN ARCH'T.
Watertown, N.Y.
JUNE 1900.

Figure 40. Floor plan of the cellar of a typical dwelling house.

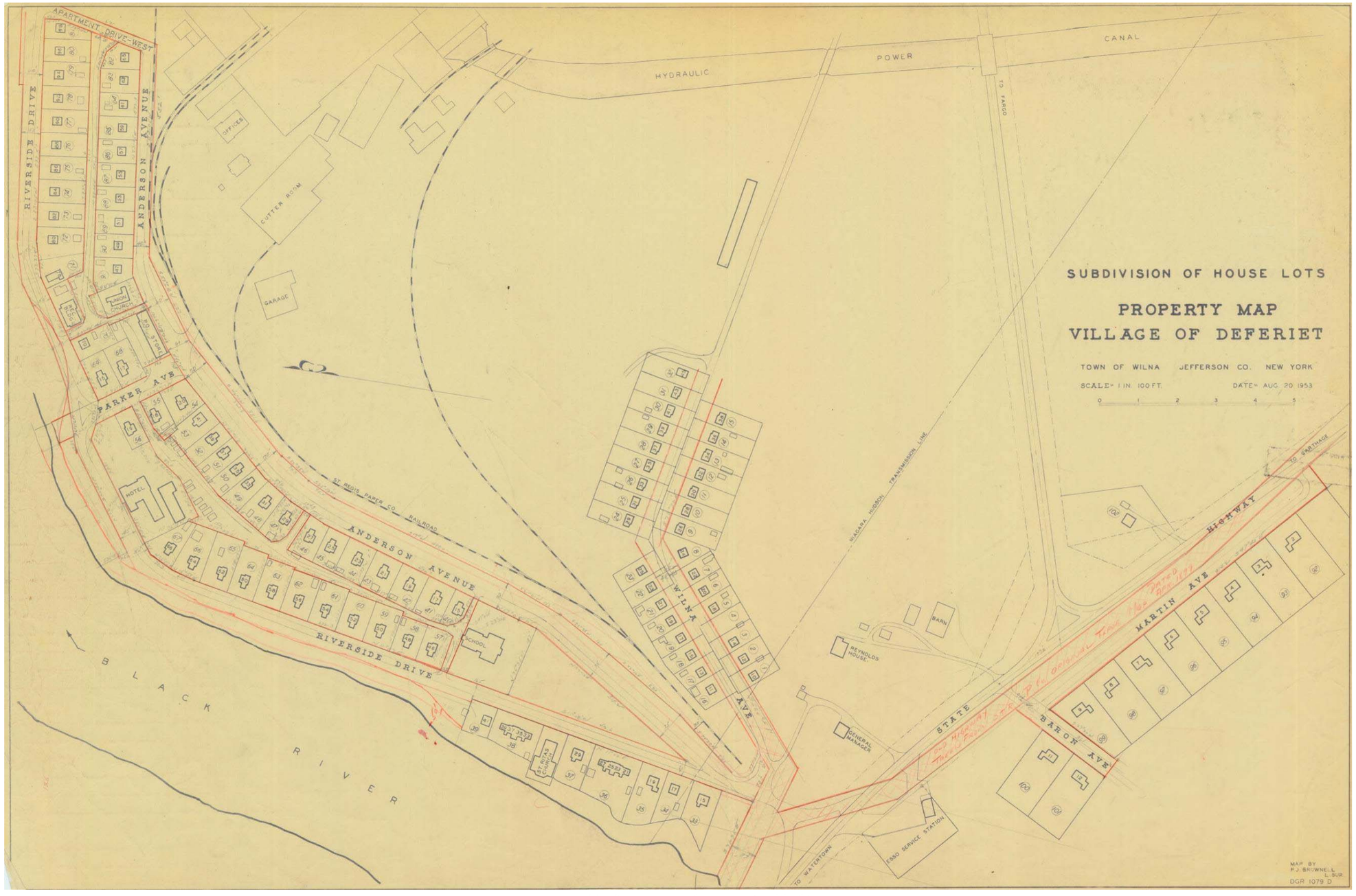


Figure 41. Subdivision of house lots (1953).

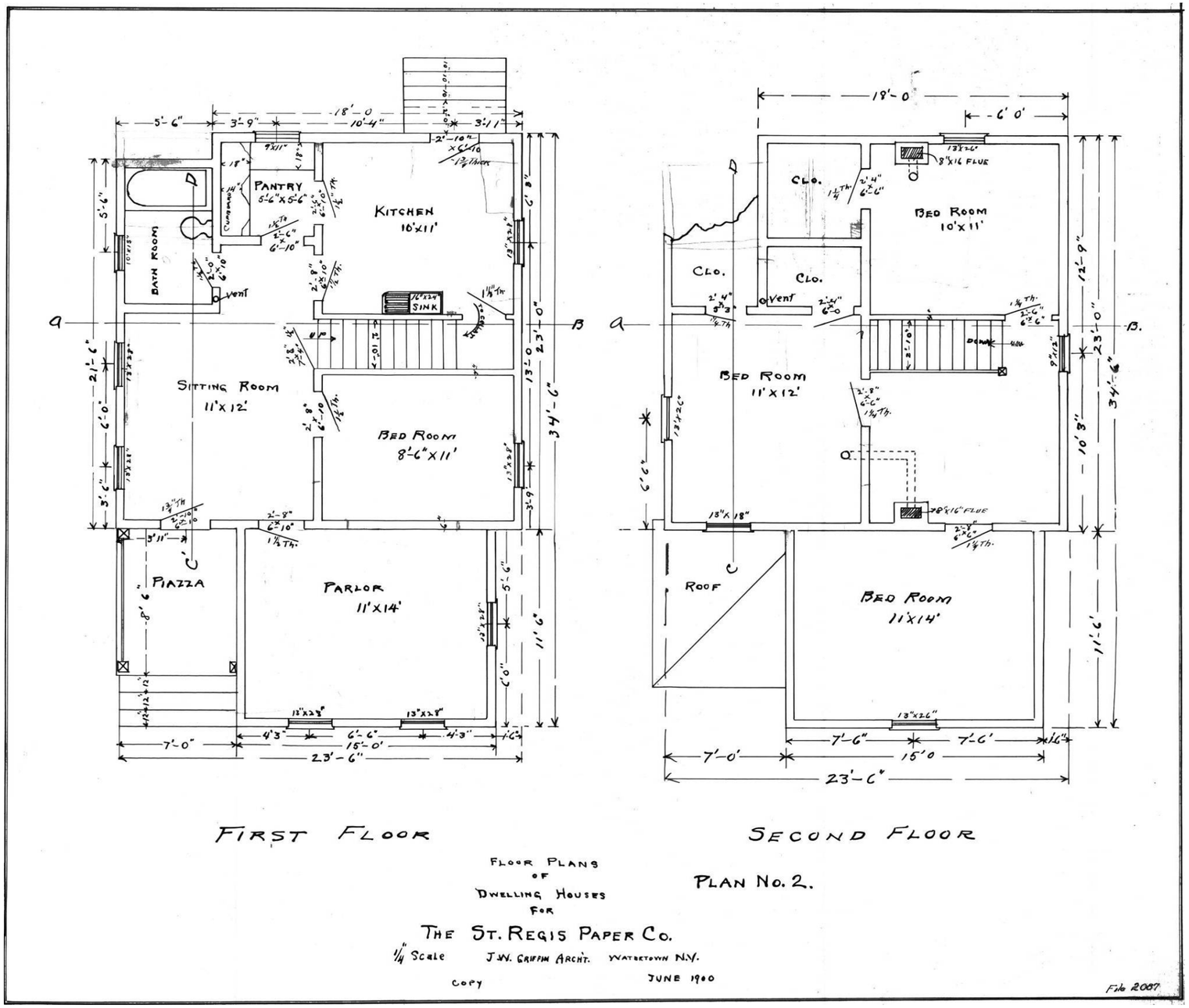


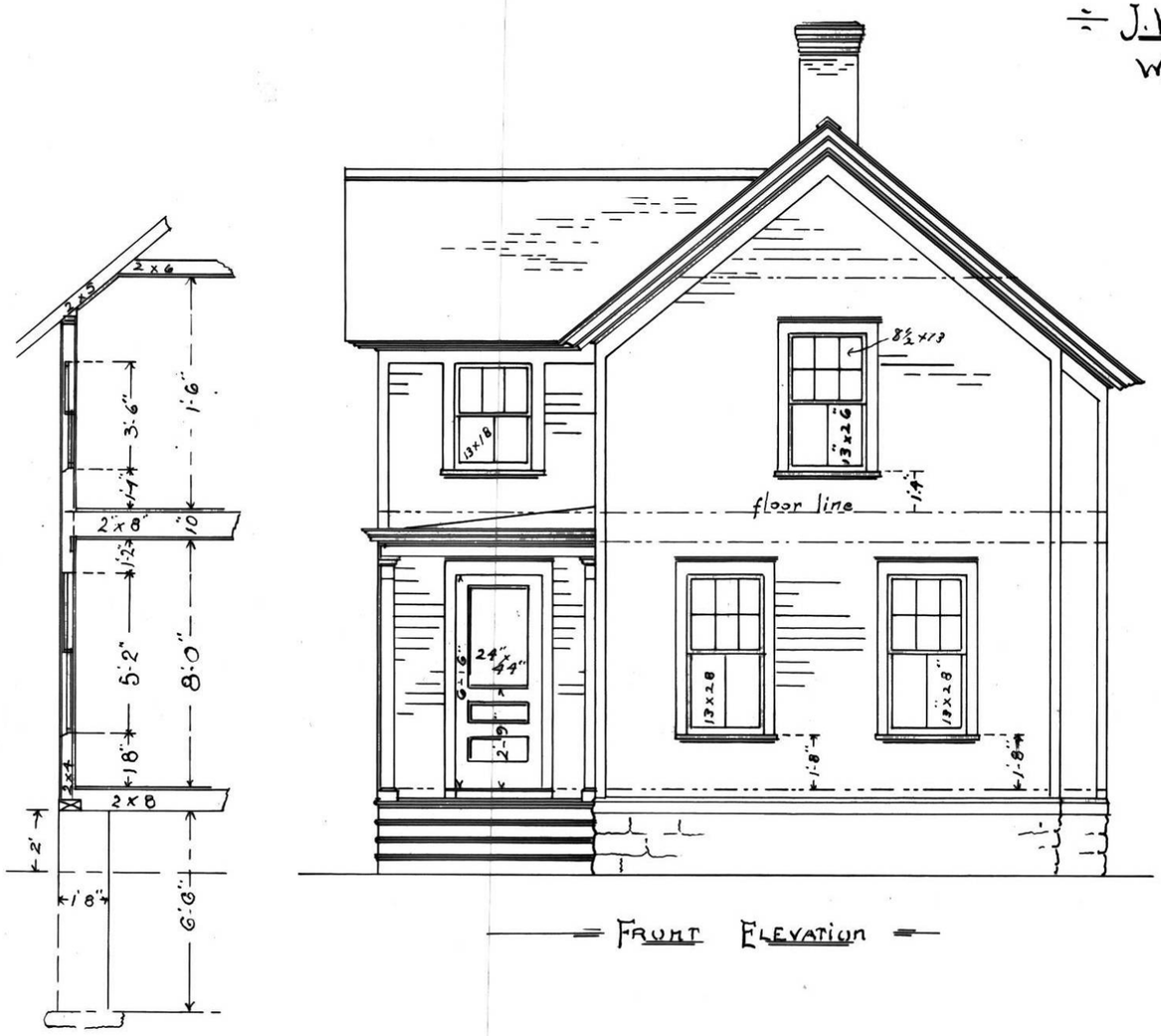
Figure 42. First and second floor plans of typical dwelling house.

Elevations of Dwelling Houses
for
THE ST. REGIS PAPER Co.

Scale 1" = 1'

J.W. Griffin. Archt
WATERTOWN, ~ N.Y.

File 2089.



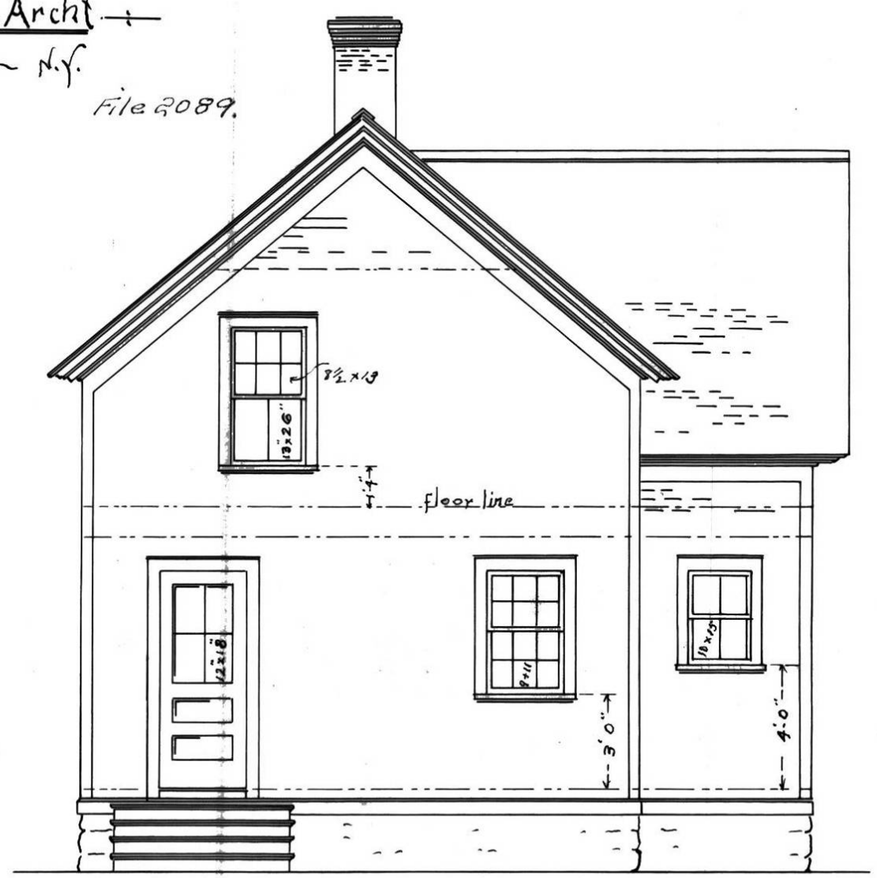


Figure 43. Front and rear elevations of a typical dwelling house.

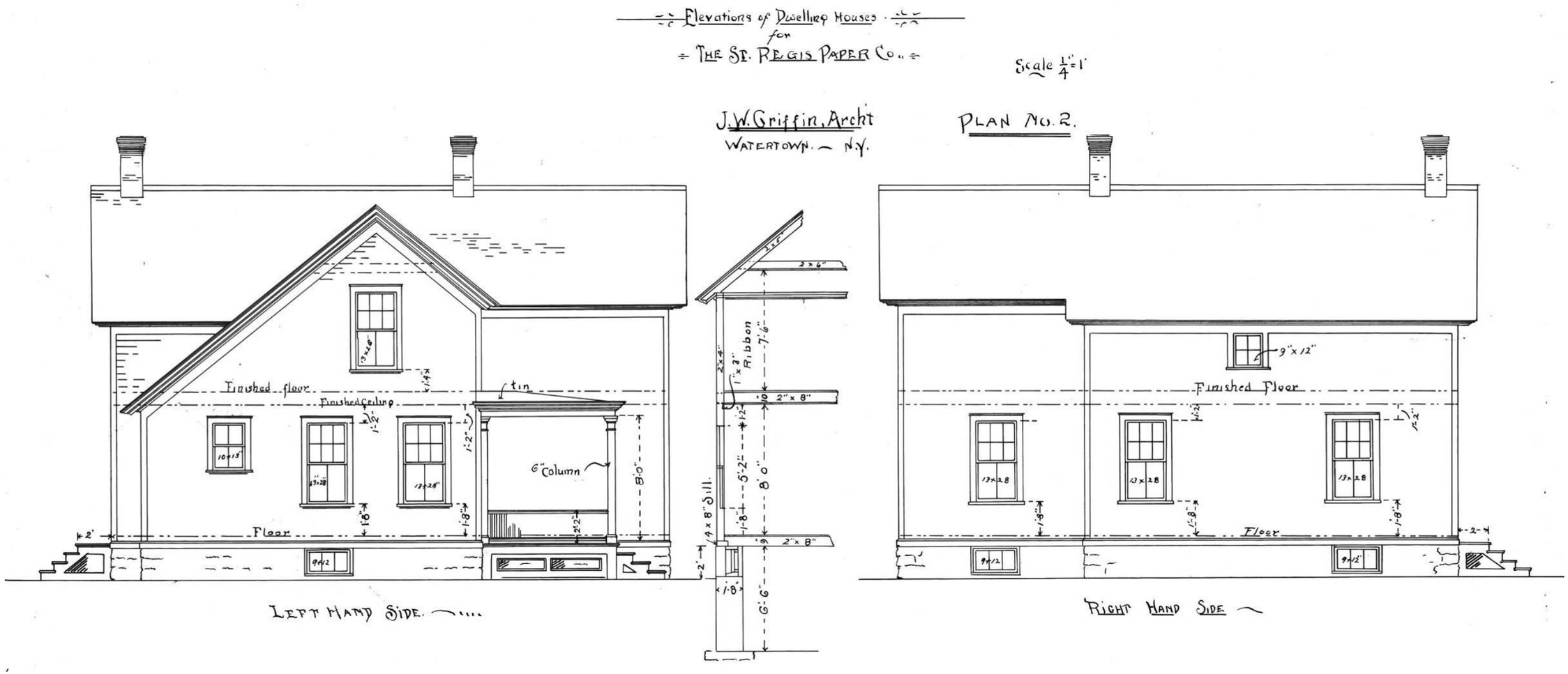


Figure 44. Left and right elevations of a typical dwelling house.

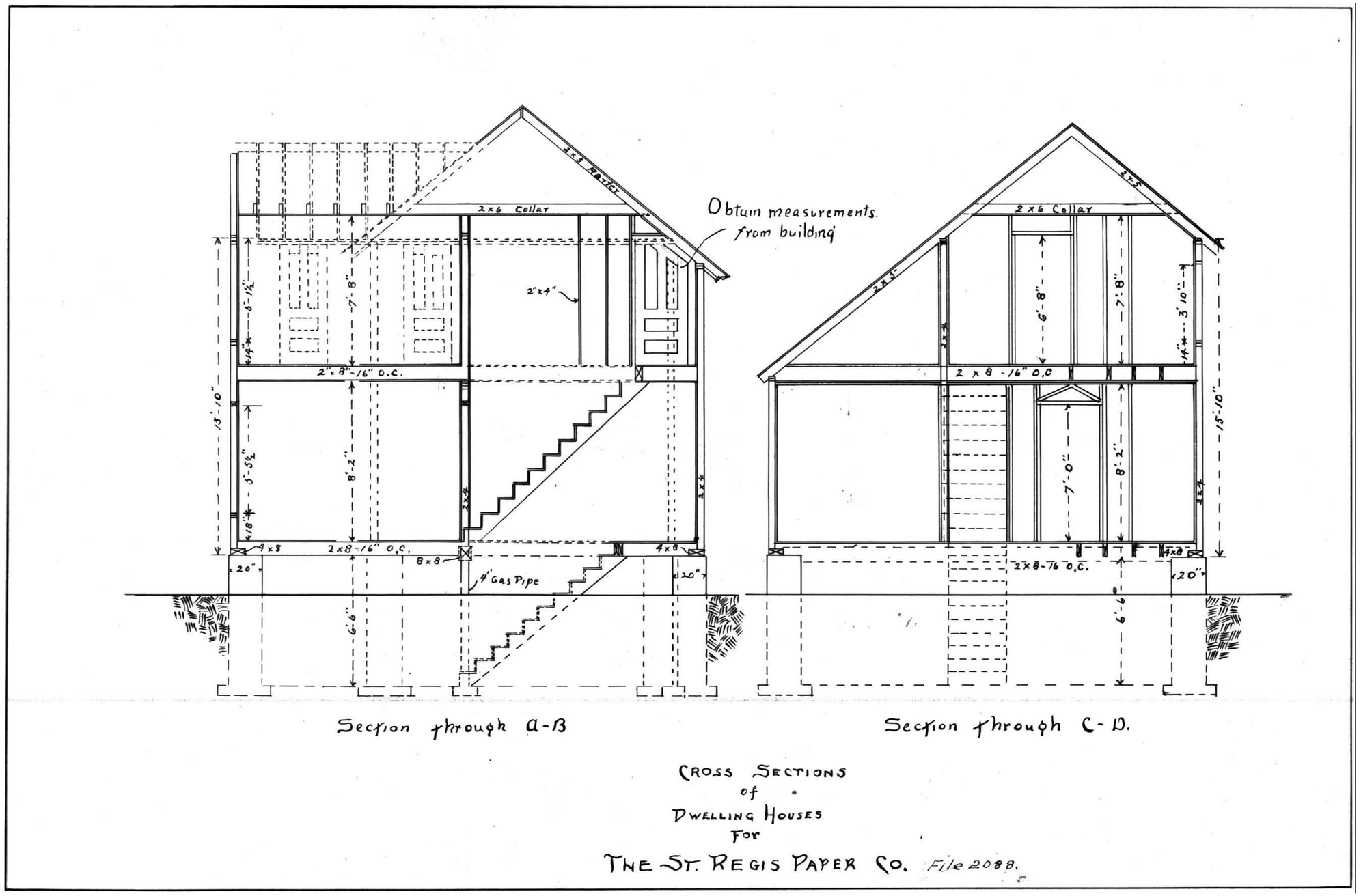


Figure 45. Sections through a typical dwelling house.

Overall Site

Figure 46. Exterior of intersection of Anderson Avenue (north/south) and Parker Avenue (east/west) facing southwest .

Figure 47. View of Deferiet, NY from across the Black River.

Figure 48. Exterior of dwellings.

Sulfite Mill

Figure 49. Exterior of southeast elevation of sulfite mill.

Figure 50. Exterior of south corner of sulfite mill.

Figure 51. Exterior of second level, southernmost corner of southwest elevation of sulfite mill.

Figure 52. Exterior of southwest elevation of sulfite mill.

Figure 53. Enlarged exterior of southwest elevation of sulfite mill.

Figure 54. Exterior of westernmost opening in southwest elevation of sulfite mill.

Figure 55. Exterior of southernmost opening in southwest elevation of sulfite mill.

Figure 56. Exterior of southwest corner of sulfite mill.

Figure 57. Exterior of second level corner of west corner and northwest elevation of sulfite mill.

Figure 58. Exterior of debris south of sulfite mill.

Figure 59. Exterior of debris south of sulfite mill.

Figure 60. Exterior of debris south of sulfite mill.

Figure 61. Exterior of lower level of northwest elevation of sulfite mill.

Figure 62. Exterior of southeast elevation of sulfite mill.

Figure 63. Exterior of south corner of sulfite mill.

Figure 64. Exterior of southeast elevation of sulfite mill.

Figure 65. Exterior of southeast elevation of sulfite mill.

Figure 66. Exterior of southeast elevation of sulfite mill.

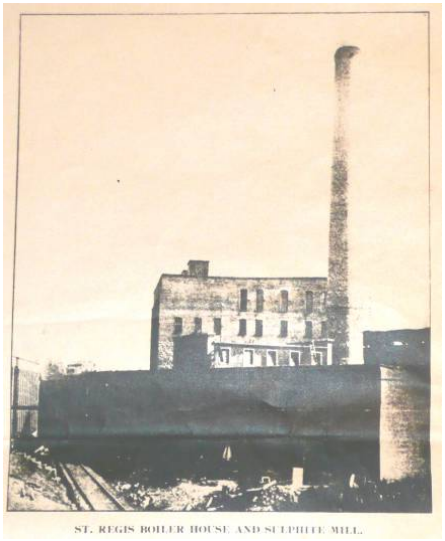


Figure 67. Exterior of original sulfite mill.

Figure 68. Exterior of southwest elevation of sulfite mill and new Boiler Bldg.

Figure 69. Exterior of northeast elevation of sulfite mill (center), with surrounding pump house (left center), hydraulic power plant (lower left), paper mill (lower right), and new boiler bldg (right center).

Figure 70. Exterior of northeast elevation of sulfite mill adjacent to paper mill.

Figure 71. Exterior of northwest elevation of sulfite mill.

Figure 72. Exterior of lower level window on northwest elevation of sulfite mill.

Figure 73. Exterior of lower level door on northwest elevation of sulfite mill.

Figure 74. Exterior of modified exterior wall and opening on northeast elevation of sulfite mill.

Figure 75. Exterior of northwest elevation of connection between sulfite mill (right) and paper mill (left).

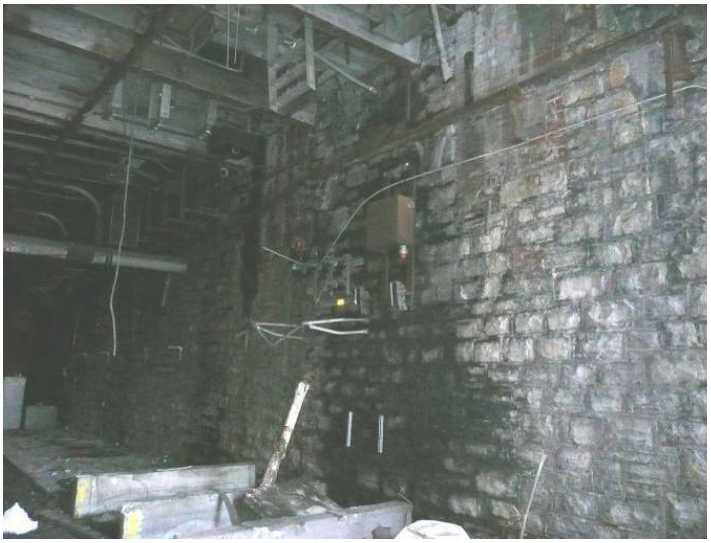


Figure 76. Interior of electrical system on northeast elevation of sulfite mill.

Figure 77. Interior of modified opening in sulfite mill.

Figure 78. Interior of modified exterior wall in sulfite mill.

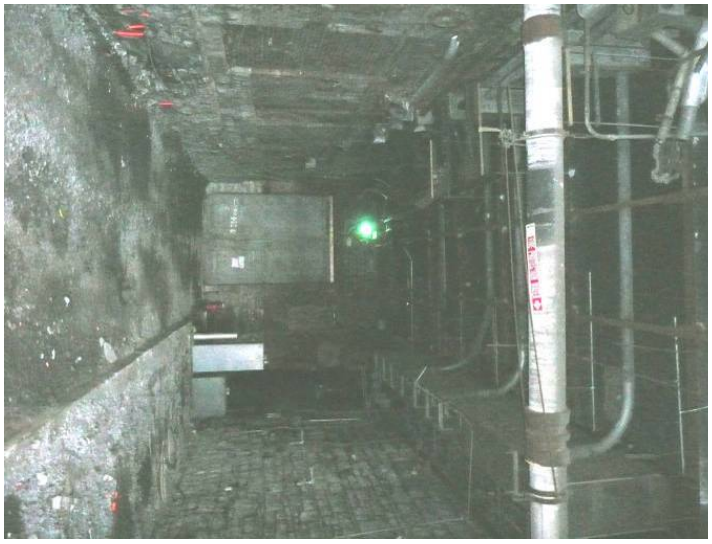


Figure 79. Interior of interior conditions of sulfite mill.

Figure 80. Interior of door in sulfite mill.

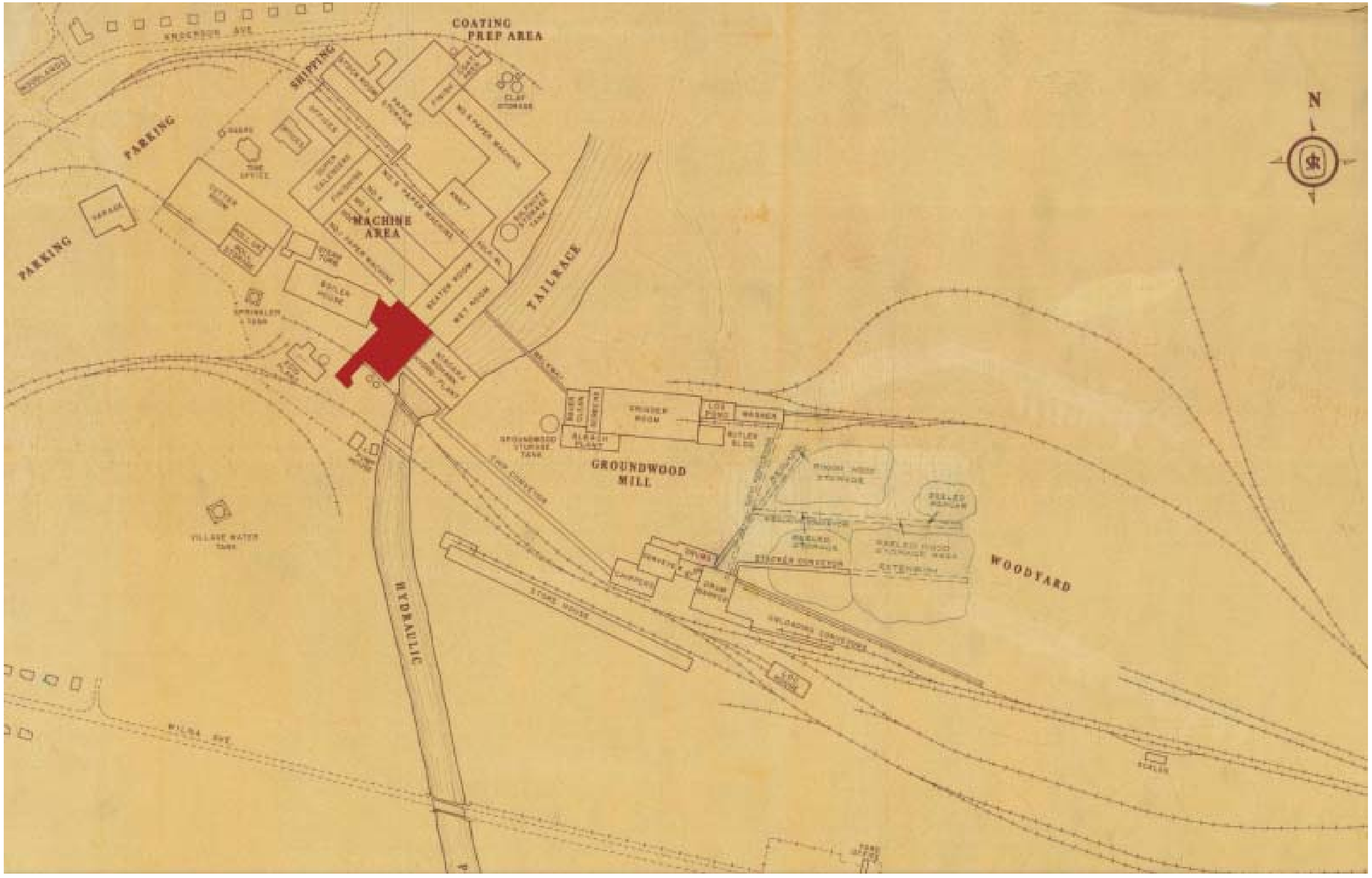


Figure 81. Map of sulfite mill (red) within arrangement of Deferiet mills properties.

Original Administration Building

Figure 82. Exterior of west corner of original Administration Bldg.

Figure 83. Exterior of northwest elevation (front entrance) of original Administration Bldg.

Figure 84. Exterior of front entrance doors on northwest elevation of original Administration Bldg.

Figure 85. Exterior of details above front entrance doors on northwest elevation of original Administration Bldg.

Figure 86. Exterior of east corner of original Administration Bldg.

Figure 87. Exterior of windows on northeast elevation of original Administration Bldg.

Figure 88. Exterior of south corner of original Administration Bldg.

Figure 89. Exterior of details above rear entrance door on southeast elevation of original Administration Bldg.

Figure 90. Exterior of rear entrance door on southeast elevation of original Administration Bldg.

Figure 91. Exterior of column capital detail on southeast elevation of original Administration Bldg.

Figure 92. Exterior of rear entrance door and façade on southeast elevation of original Administration Bldg.

Figure 93. Exterior of windows on northeast elevation of original Administration Bldg.

Figure 94. Interior of window on southwest elevation of original Administration Bldg.

Figure 95. Interior of windows on southeast elevation of original Administration Bldg.

Figure 96. Interior of systems above acoustic ceiling tile system of original Administration Bldg.

Figure 97. Interior of storage room door in original Administration Bldg.

Figure 98. Interior of electrical conduit in original Administration Bldg.

Figure 99. Interior of typical leftover equipment and supplies in original Administration Bldg.

Figure 100. Interior of mechanical room in original Administration Bldg.

Figure 101. Interior of lobby facing northwest of original Administration Bldg.

Figure 102. Exterior of northwest elevation of original Administration Bldg (center), with surrounding new Administration Bldg (left center), paper mill (left), and Cutter Bldg (right).

Figure 103. Map of original Administration Bldg (red) within overall Deferiet mills properties.

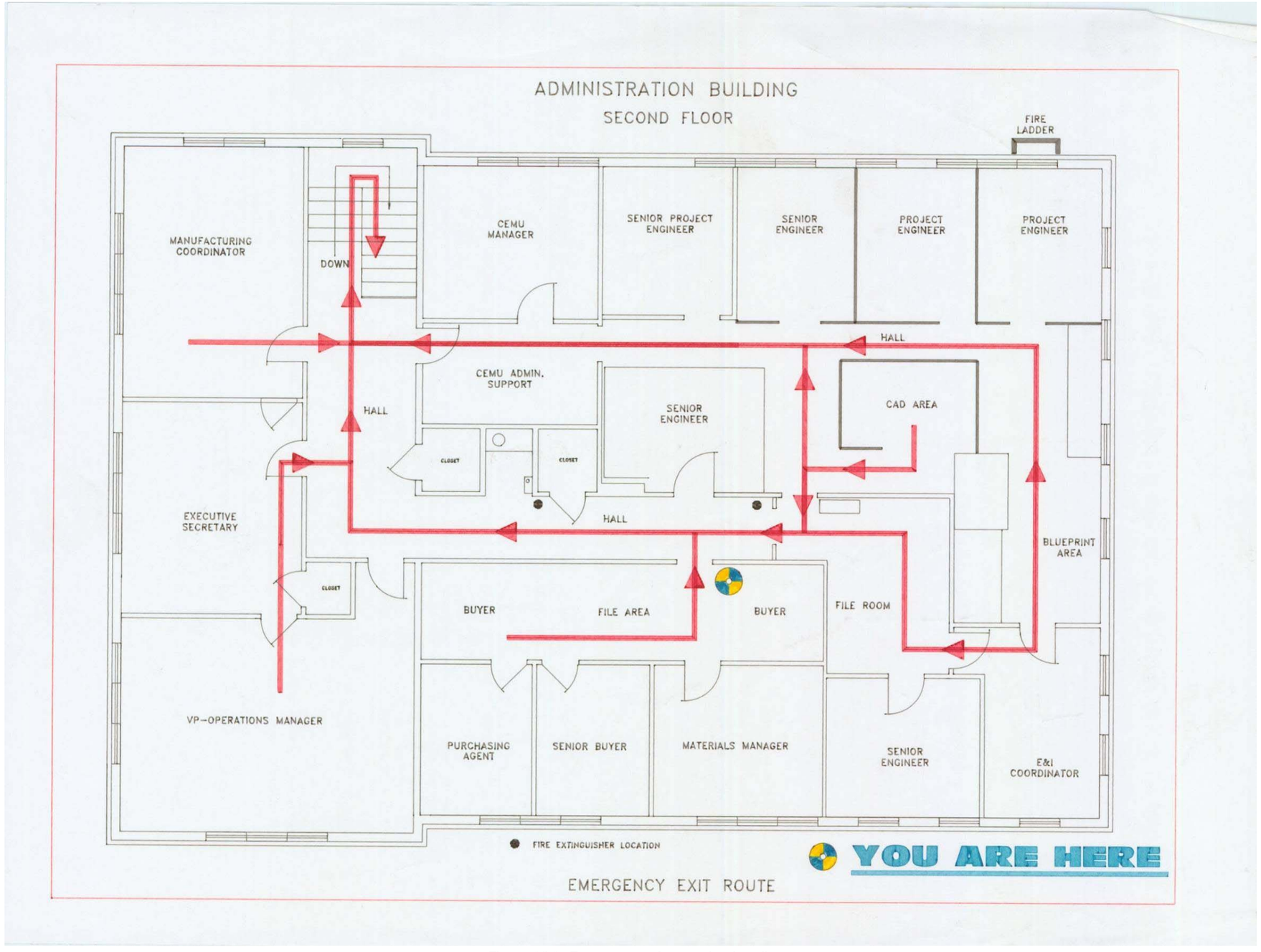


Figure 104. Emergency exit route (undated).

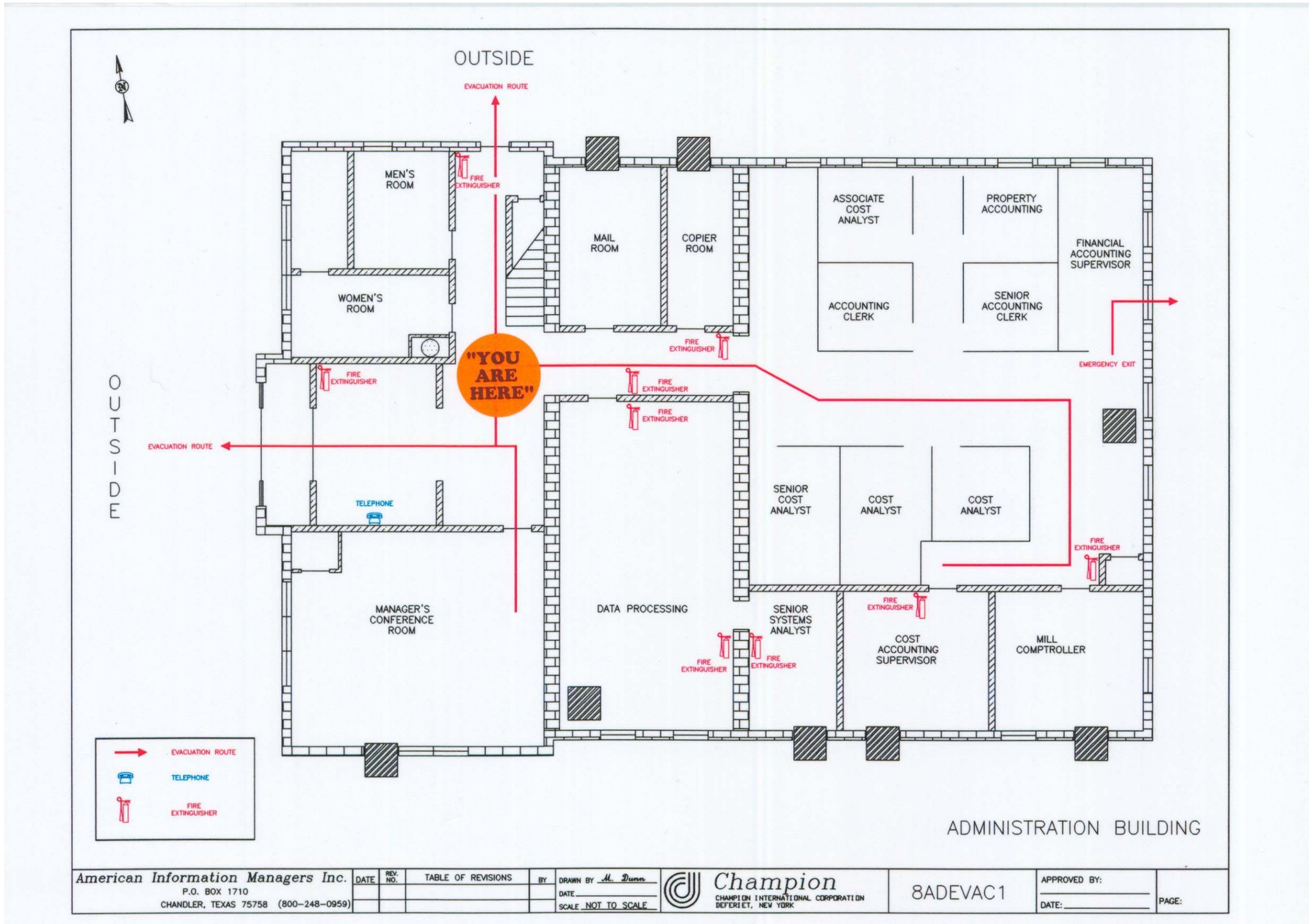


Figure 105. Emergency exit route for first level (undated).

New Administration Building

Figure 106. Exterior of west corner of new Administration Bldg.

Figure 107. Exterior of north corner of new Administration Bldg.

Figure 108. Exterior of original brick and windows and second level addition of brick and windows on southwest elevation of new Administration Bldg.

Figure 109. Exterior of southwest elevation of new Administration Bldg.

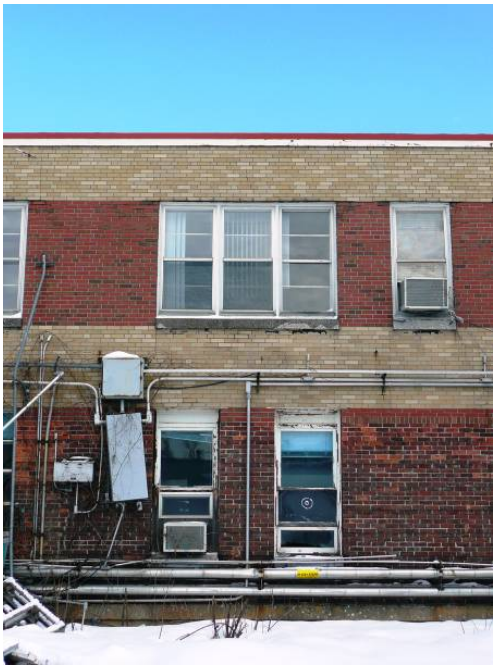


Figure 110. Exterior of original brick and windows and second level addition of brick and windows on southwest elevation of new Administration Bldg.

Figure 111. Exterior of southwest elevation/south corner of new Administration Bldg.

Figure 112. Exterior of original brick and windows on southwest elevation of new Administration Bldg.

Figure 113. Exterior of southeast elevation of new Administration Bldg, facing northeast, adjacent to paper mill.

Figure 114. Interior of lobby facing front entrance doors on northwest elevation of new Administration Bldg.

Figure 115. Interior of lobby from corridor, facing front entrance doors on northwest elevation of new Administration Bldg.

Figure 116. Interior of lobby entrance windows on the northwest elevation of new Administration Bldg.

Figure 117. Interior of staircase addition in new Administration Bldg.

Figure 118. Interior of corridor facing northeast in new Administration Bldg.

Figure 119. Interior of windows in new Administration Bldg.

Figure 120. Interior of Controller's Office in new Administration Bldg.

Figure 121. Interior in new Administration Bldg.

Figure 122. Exterior of northwest elevation of new Administration Bldg (left center), with surrounding paper mill (left), original Administration Bldg (center), and Cutter Bldg (right).

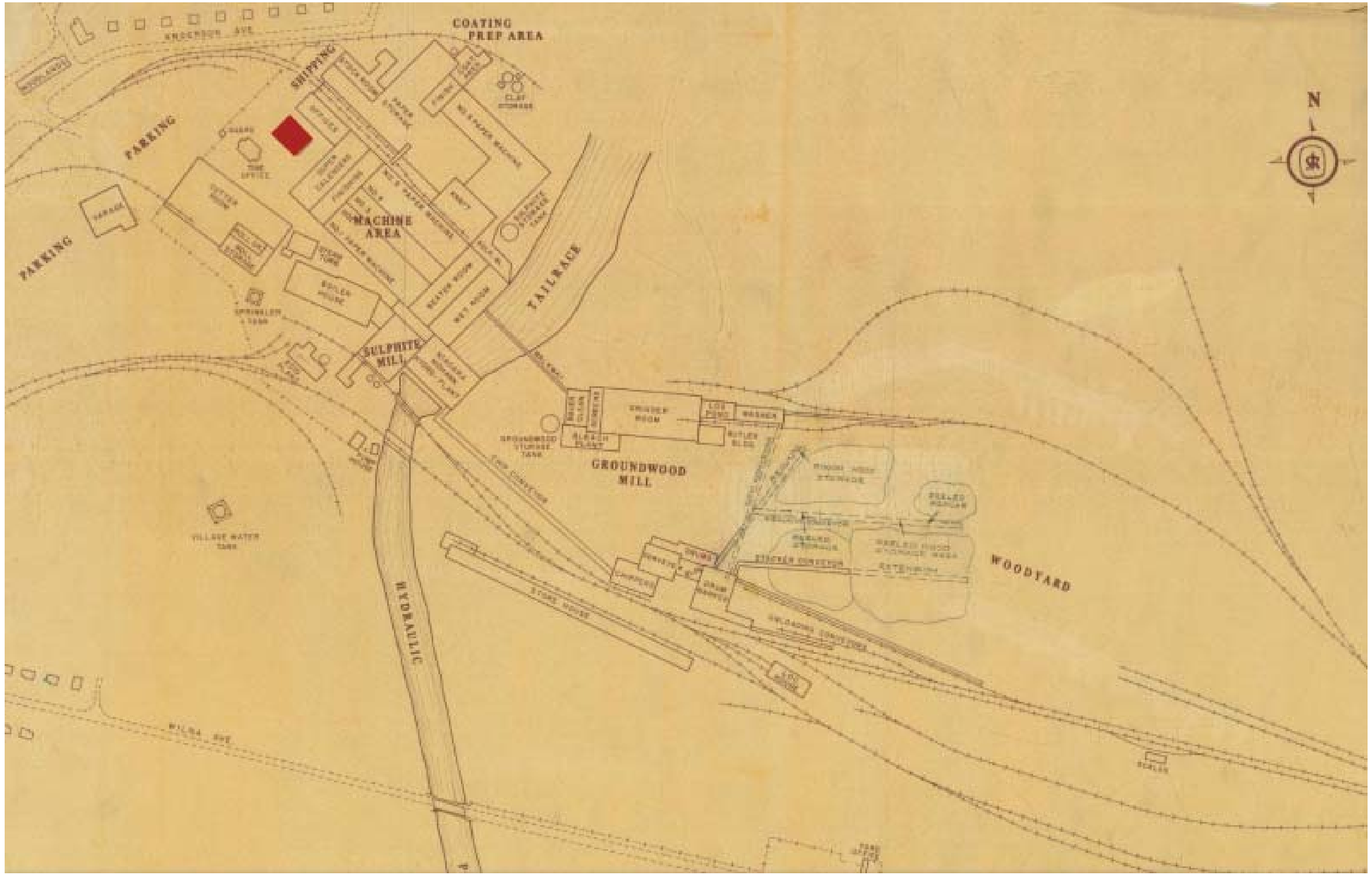


Figure 123. Map of new Administration Bldg (red) within overall Deferiet Mills properties.

Paper Mill and Machines Area

Figure 124. Exterior of southwest elevation/west corner of paper mill adjacent to new Administration Bldg.

Figure 125. Exterior of northwest elevation/west corner of paper mill adjacent to new Administration Bldg.

Figure 126. Exterior facing east of northwest elevation/west corner of paper mill adjacent to new Administration Bldg.

Figure 127. Exterior of opening in northwest elevation of paper mill.

Figure 128. Exterior of entrance door to paper mill.

Figure 129. Interior of corridor in paper mill.

Figure 130. Interior of laptop and furniture abandoned in paper mill.

Figure 131. Exterior of southwest elevation of paper mill (left/center), with surrounding sulfite mill (center), new and original Boiler Bldgs (right center), Cutter Bldg (right of Boilers), and original Administration Bldg (right).

Figure 132. Exterior of southwest elevation of paper mill (left) adjacent to sulfite mill (center) and new Boiler Bldg (right).

Figure 133. Exterior of southwest elevation/south corner of paper mill.

Figure 134. Exterior of southwest elevation of paper mill.

Figure 135. Exterior of southwest elevation of paper mill.

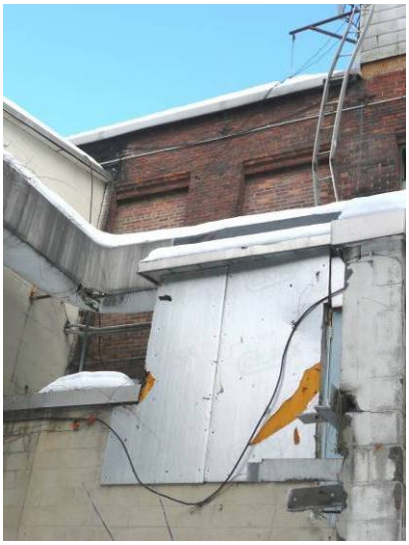


Figure 136. Exterior of southwest elevation of paper mill.

Figure 137. Exterior of foundation conditions on southwest elevation of paper mill.

Figure 138. Exterior of modified opening on southwest elevation of paper mill.

Figure 139. Exterior of modified opening on southwest elevation of paper mill.

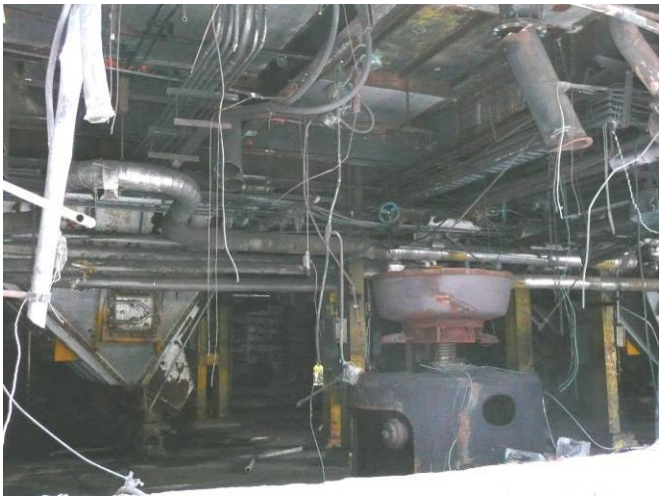


Figure 140. Interior of systems within the paper mill.

Figure 141. Exterior of southwest elevation of paper mill.

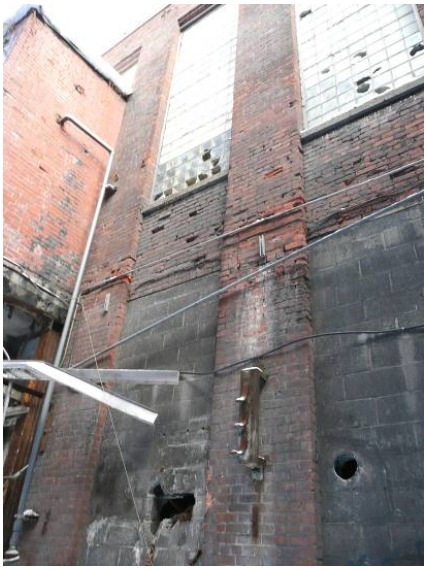


Figure 142. Exterior of southwest elevation of paper mill.

Figure 143. Exterior of foundation condition on southwest elevation of paper mill.

Figure 144. Exterior of north corner/northeast elevation of paper mill .

Figure 145. Exterior of southwest (left) and northwest (center) elevations of paper mill storage area.

Figure 146. Exterior of northwest elevation of paper mill storage area.

Figure 147. Exterior of northwest elevation (right) and southwest elevation (left) of paper mill storage area.

Figure 148. Exterior of northwest elevation of paper mill storage area.

Figure 149. Exterior of southwest elevation of paper mill storage area.

Figure 150. Exterior of northwest elevation of paper mill (left), with surrounding new Administration Bldg (right center), original Administration Bldg (center), and Cutter Bldg (right).

Figure 151. Exterior of east corner and northeast and southeast elevations of paper mill (lower right), with surrounding Hydraulic Power Plant (lower left), Pump House (left center), sulfite mill (center), and new Boiler Bldg (right).

Figure 152. Exterior of northeast elevation of paper mill storage area.

Figure 153. Exterior of Clay Storage Bldgs located just north of paper mill storage area (far left).

Figure 154. Exterior of northwest elevation of Clay Storage Bldgs (left) and paper mill storage area (right).

Figure 155. Exterior of southeast elevation of paper mill.

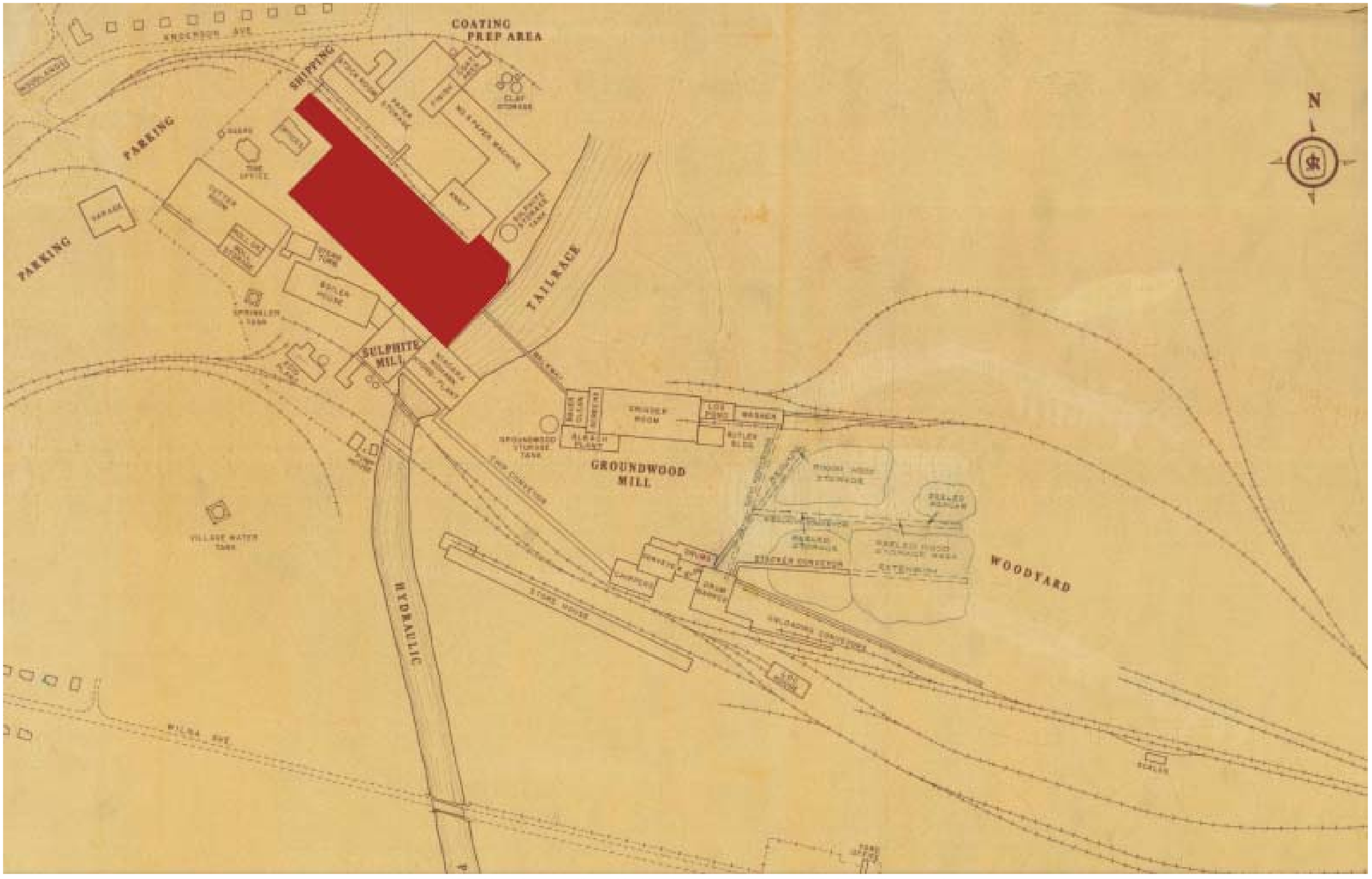


Figure 156. Map of paper mill and Machine Areas (red) within overall Deferiet Mills properties.

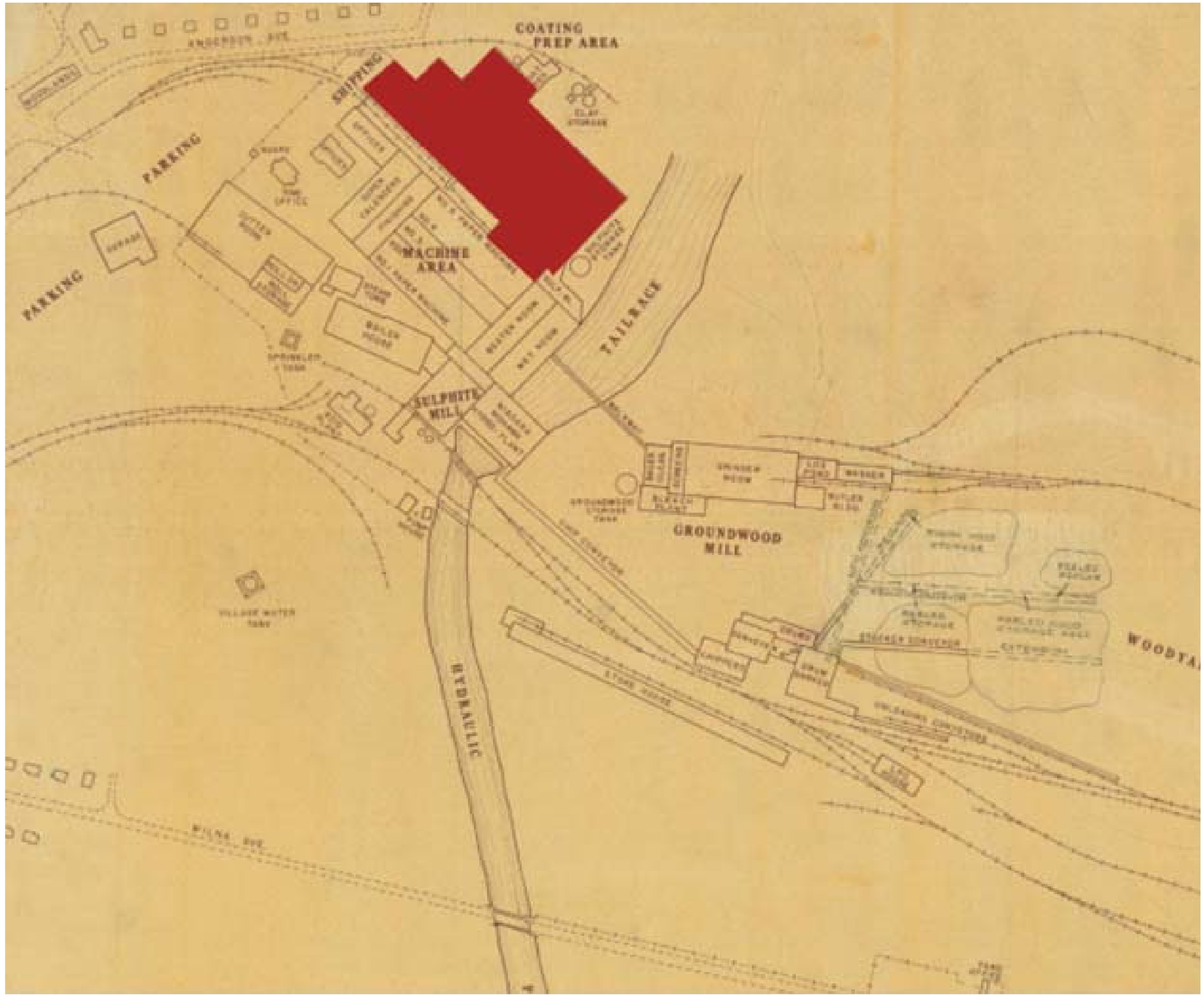


Figure 157. Map of paper mill Storage Areas (red) within overall Deferiet Mills properties.

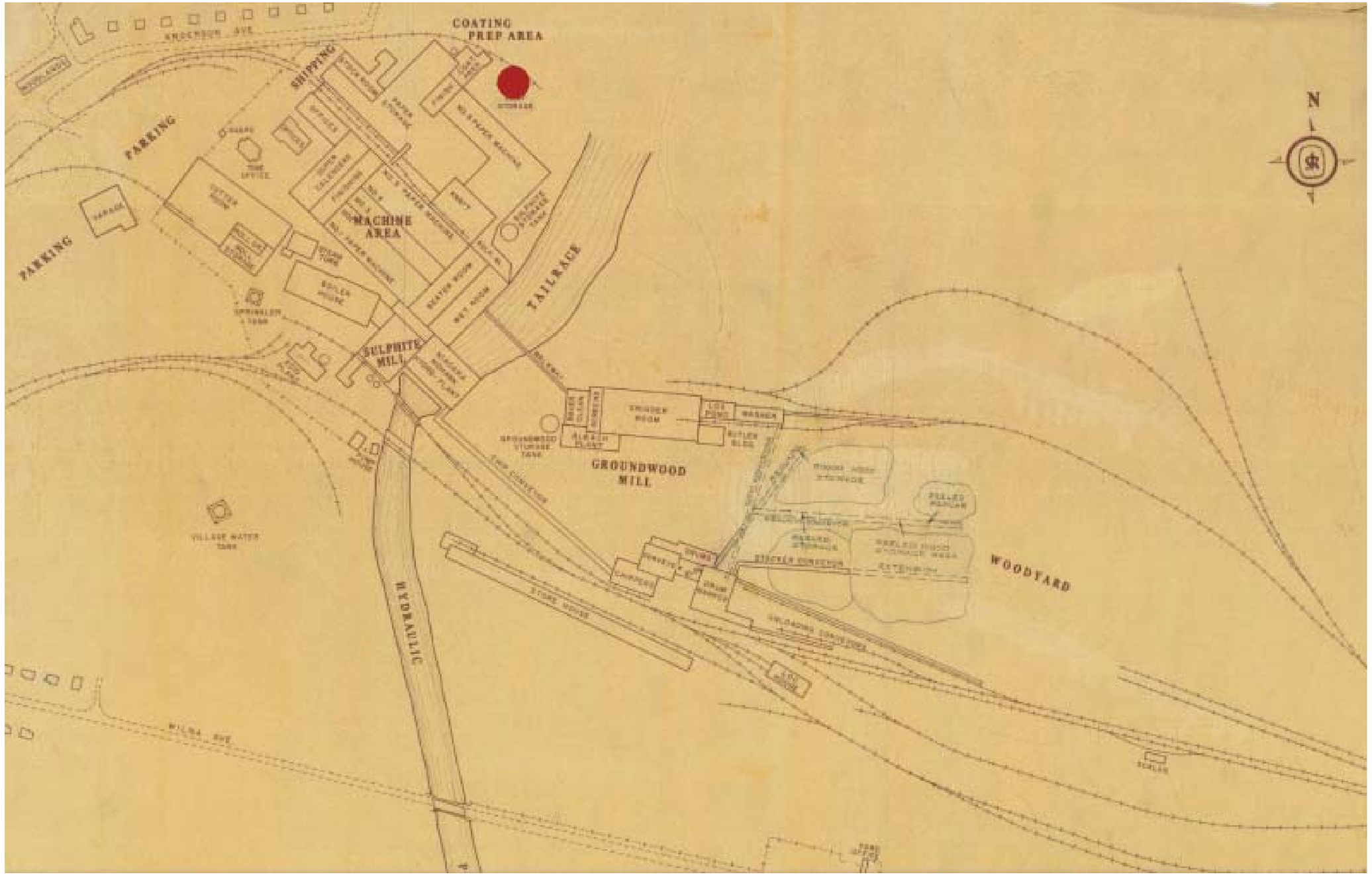


Figure 158. Map of Clay Storage Areas (red) within overall Deferiet Mills properties.

Boiler Buildings

Figure 159. Exterior of southwest elevation/west corner of original Boiler Bldg.

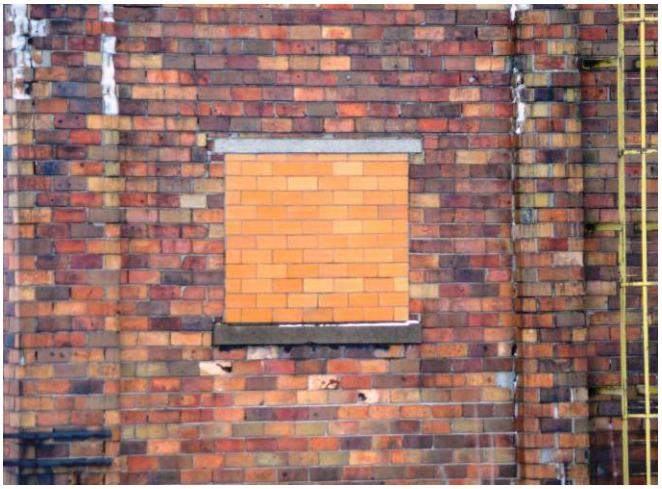


Figure 160. Exterior of modified window on the southwest elevation of original Boiler Bldg.

Figure 161. Exterior of northeast elevation/north corner of original (right center) and new (center) Boiler Bldgs.

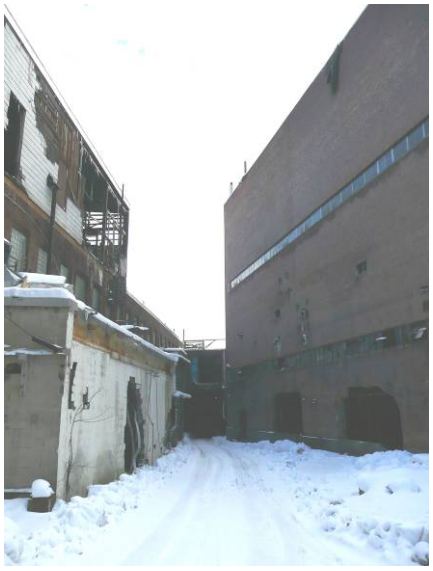


Figure 162. Exterior of northeast elevation of new Boiler Bldg (right), adjacent to sulfite mill (center) and paper mill (left).

Figure 163. Exterior of opening in northeast elevation of new Boiler Bldg.

Figure 164. Exterior of modified opening in northeast elevation of new Boiler Bldg.

Figure 165. Exterior of northeast elevation/north corner of original Boiler Bldg (left center) adjacent to Cutter Bldg (right).

Figure 166. Exterior of southwest elevation of original Boiler Bldg (center) adjacent to new Boiler Bldg (right) and Cutter Bldg (left).

Figure 167. Exterior of southwest elevation of original Boiler Bldg.

Figure 168. Modified window opening on southwest elevation of original Boiler Bldg.

Figure 169. Exterior of door openings on northeast elevation of original Boiler Bldg.

Figure 170. Exterior of southwest elevation of new Boiler Bldg adjacent to sulfite mill (beyond right).

Figure 171. Exterior of southwest elevation of new Boiler Bldg adjacent to original Boiler Bldg (far left)

Figure 172. Exterior of southwest elevation of new Boiler Bldg adjacent to sulfite mill.

Figure 173. Exterior of northeast elevation of new Boiler Bldg (right center), with surrounding sulfite mill (center), Pump House (left center), Hydraulic Power Plant (lower left), and paper mill (lower right).

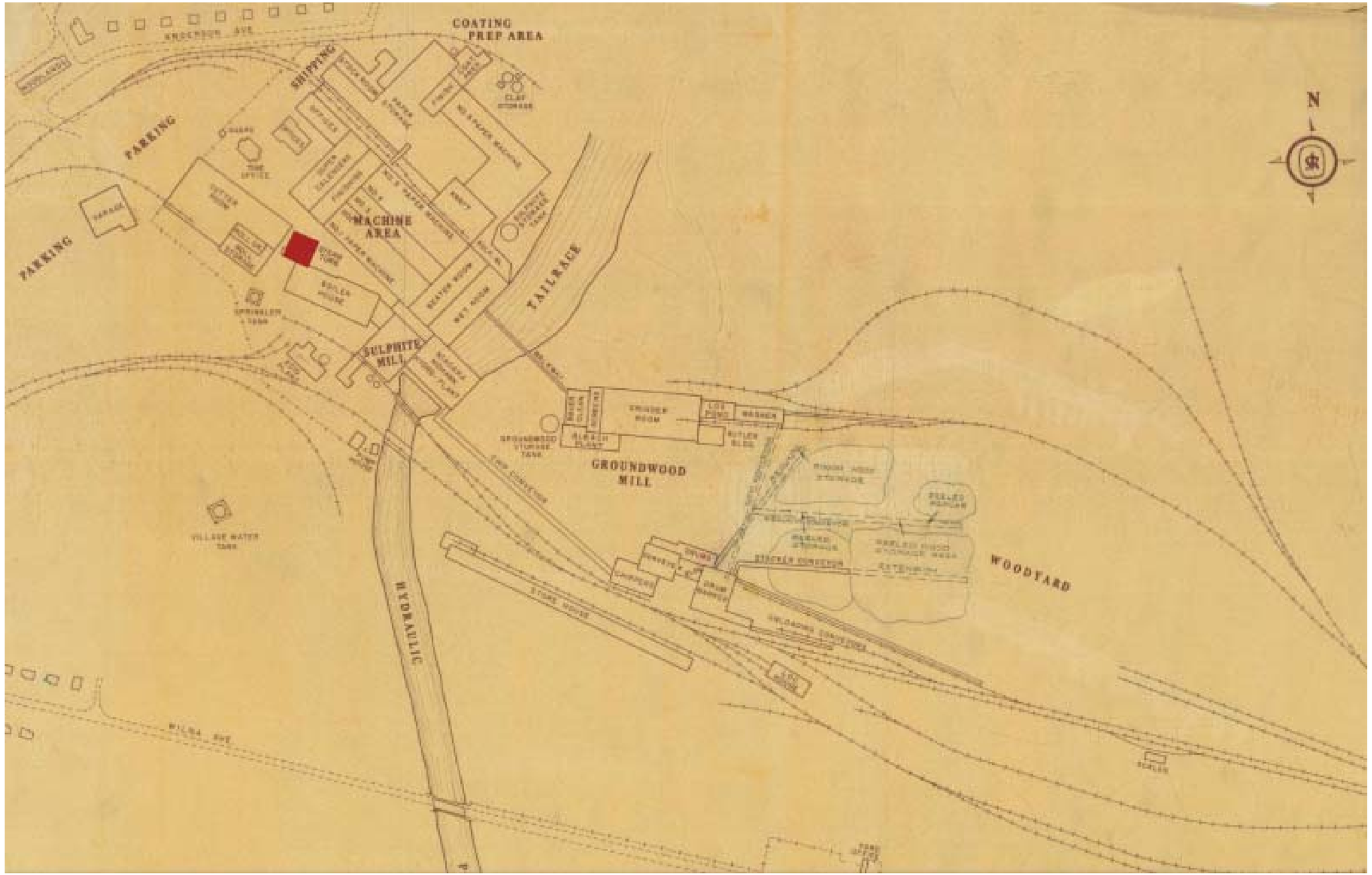


Figure 174. Map of Original Boiler Bldg (red) within overall Deferiet Mills properties.

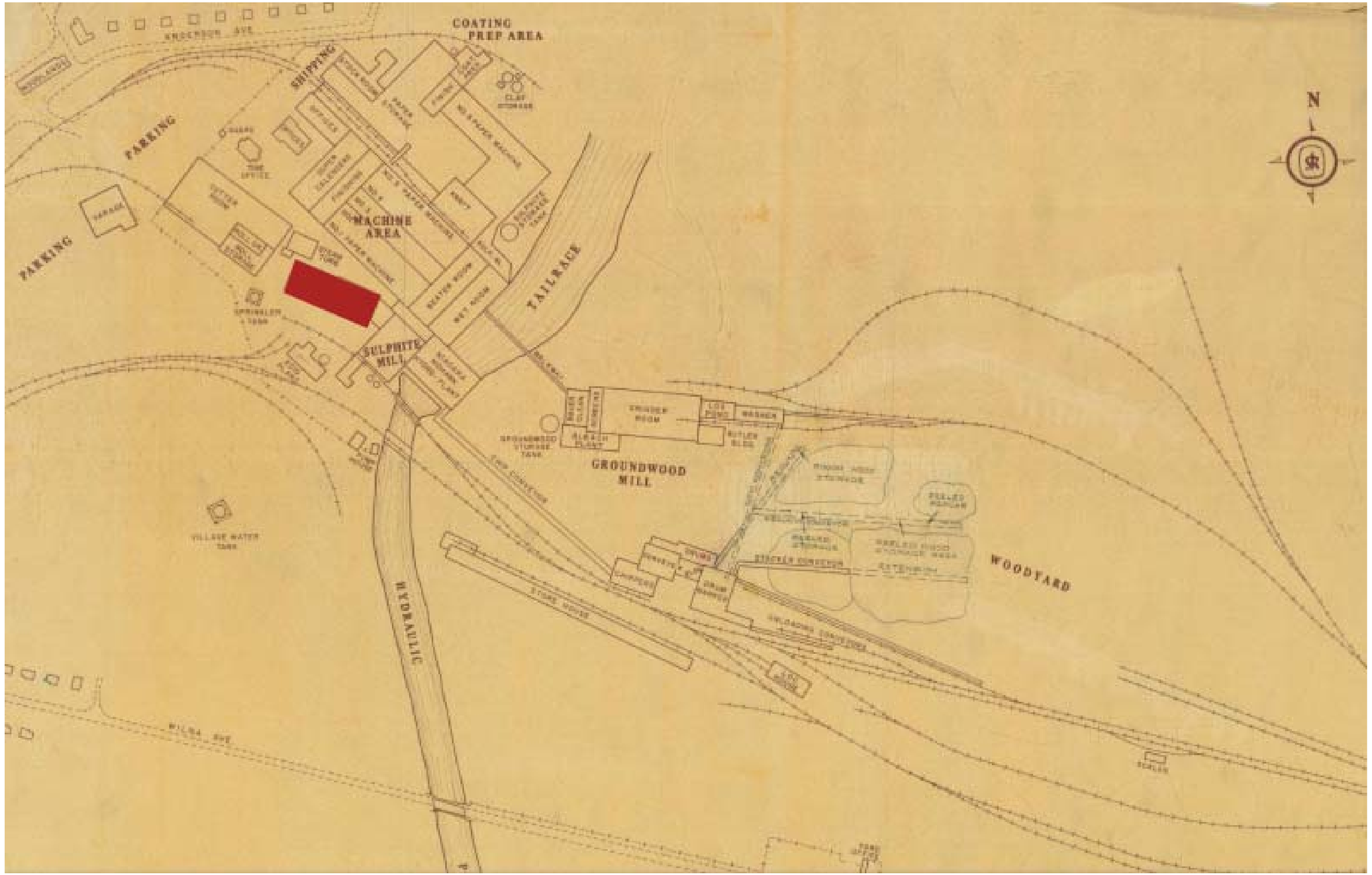


Figure 175. Map of New Boiler Bldg (red) within overall Deferiet Mills properties.

Cutter Building

Figure 176. Exterior of northeast elevation of Cutter Bldg (white and lower red brick on right).

Figure 177. Exterior of modified window openings on southeast elevation of Cutter Bldg.

Figure 178. Exterior of modified opening in northeast elevation of Cutter Bldg.

Figure 179. Exterior of northwest elevation of Cutter Bldg (right) adjacent to original Administration Bldg (center), new Administration Bldg (left center), and paper mill (far left).

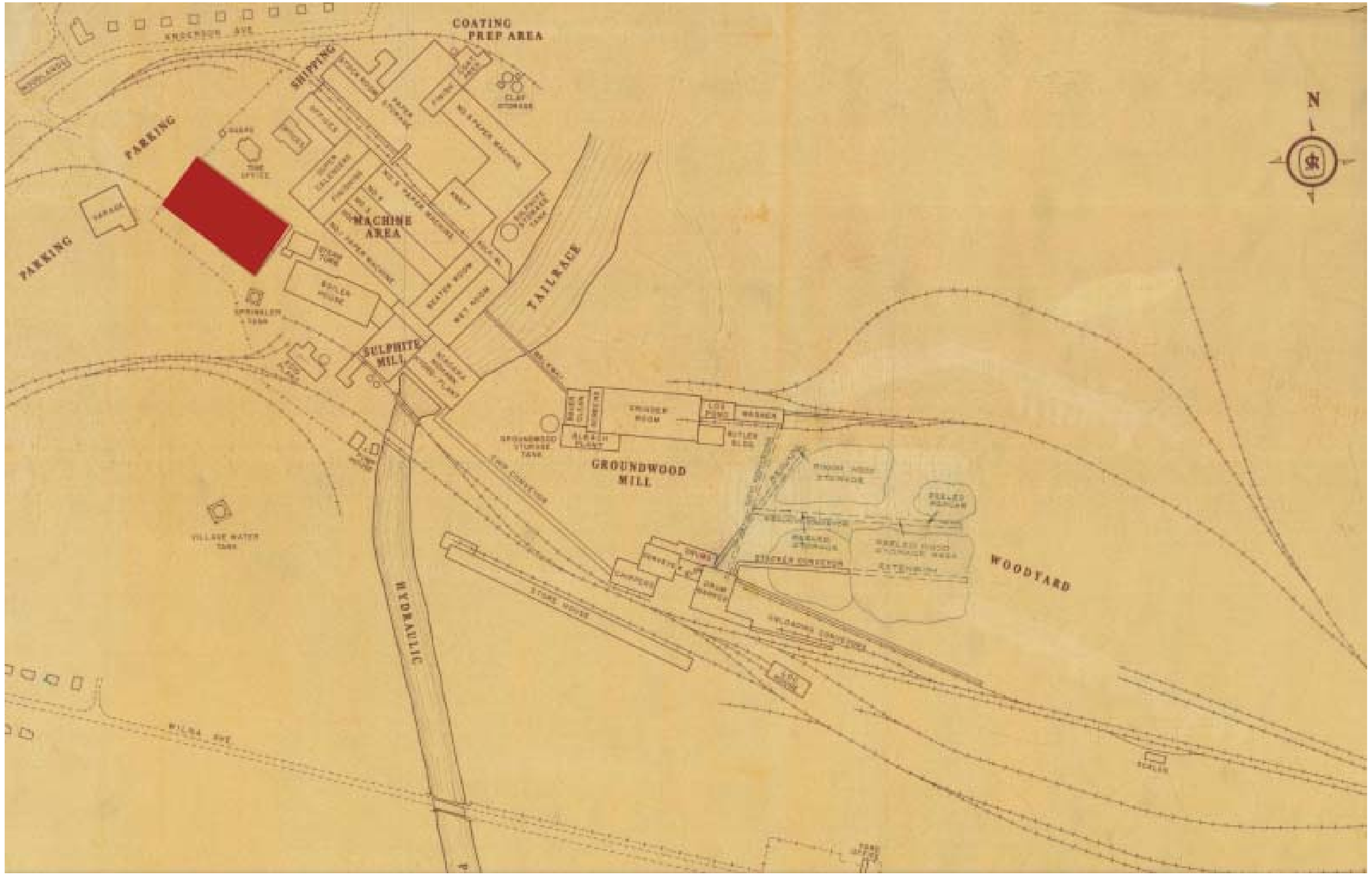


Figure 180. Map of Cutter Bldg (red) within overall Deferiet Mills properties.

Power Plant

Figure 181. Exterior of northeast elevation of Hydraulic Power Plant (lower left), with surrounding Pump House (left center), sulfite mill (center), new Boiler Bldg (right center), and paper mill (lower right).

Figure 182. Exterior of southwest elevation of Hydraulic Power Plant.

Figure 183. Exterior of southwest elevation of Hydraulic Power Plant (beyond), with small Rail Road Bridge (foreground).

Figure 184. Exterior of southwest elevation of Hydraulic Power Plant (beyond), with small rail road bridge and foundation (foreground).

Figure 185. Exterior of south corner/southwest elevation of Hydraulic Power Plant.

Figure 186. Exterior of easternmost portion of southwest elevation of Hydraulic Power Plant (lower left), with Wood Mill beyond (right).

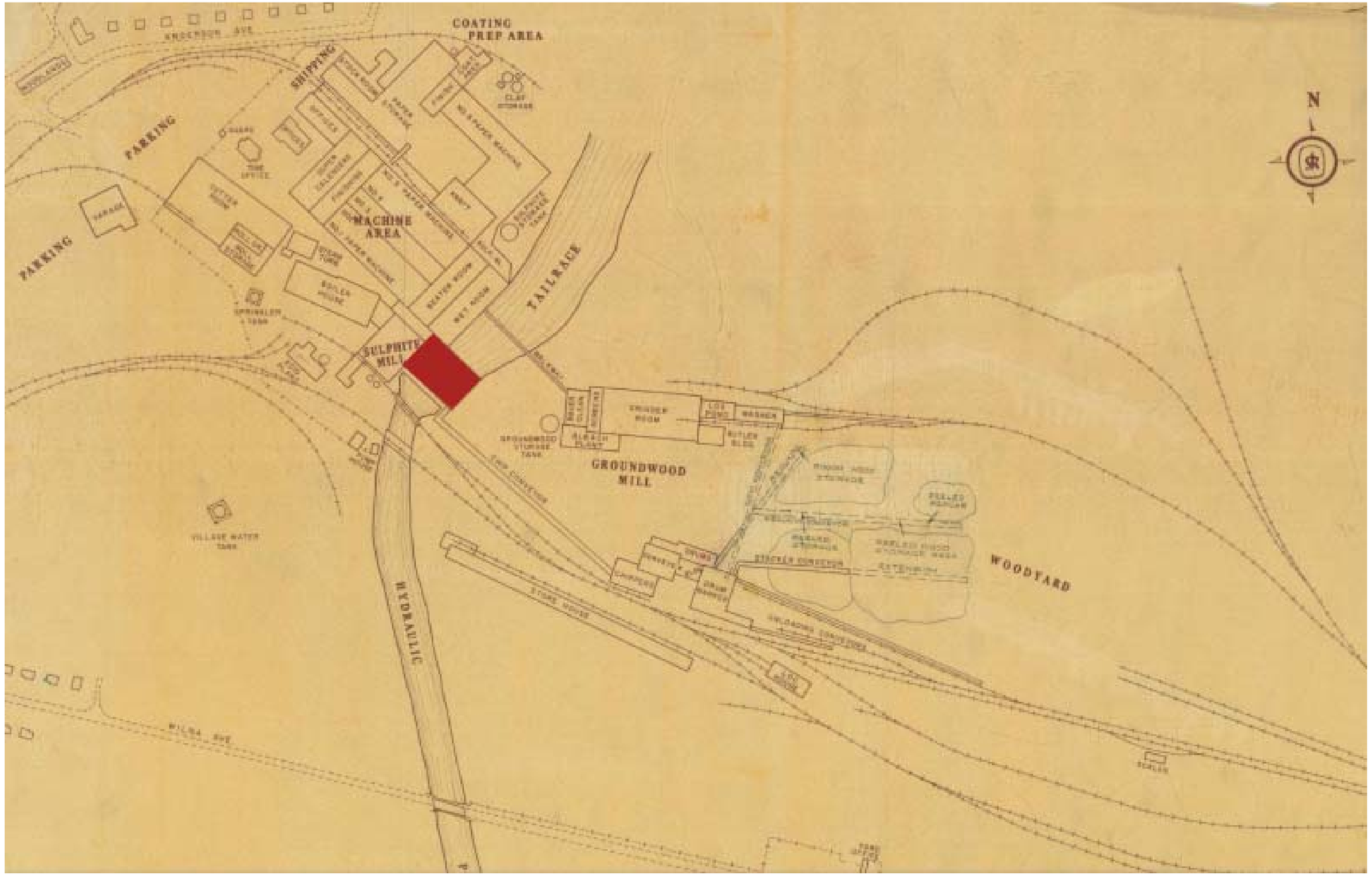


Figure 187. Map of Hydraulic Power Plant (red) within overall Deferiet Mills properties.

Wood Mill

Figure 188. Exterior of south elevation of Wood Mill

Figure 189. Exterior of south elevation of Wood Mill.

Figure 190. Exterior of easternmost portion of south elevation of Wood Mill.

Figure 191. Exterior of south elevation of Wood Mill.

Figure 192. Exterior of south elevation of Wood Mill.

Figure 193. Exterior of opening in south elevation of Wood Mill.

Figure 194. Exterior of opening and modified openings in south elevation of Wood Mill.

Figure 195. Exterior of modified openings and additions of Wood Mill.

Figure 196. Exterior of west elevation of Wood Mill (right).

Figure 197. Exterior of west elevation of Wood Mill.

Figure 198. Exterior of modified opening in west elevation of Wood Mill.

Figure 199. Exterior of easternmost portion of south elevation of Wood Mill.

Figure 200. Exterior of north elevation of Wood Mill.

Figure 201. Exterior of westernmost portion of north elevation of Wood Mill storage area.

Figure 202. Exterior of failing structure on north elevation of Wood Mill storage area.

Figure 203. Exterior of north elevation of Wood Mill storage area.

Figure 204. Exterior of easternmost portion of north elevation of Wood Mill storage area.

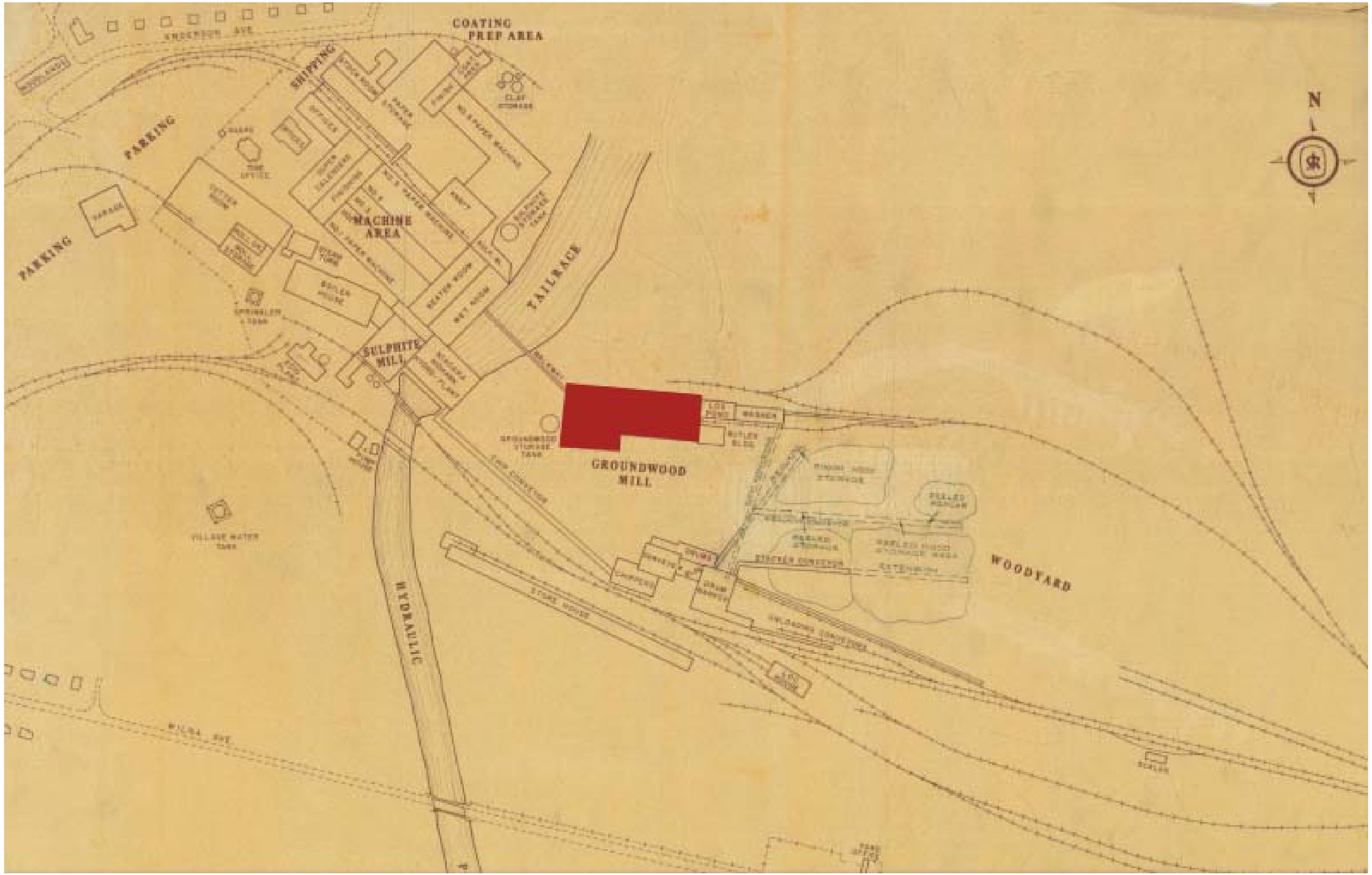


Figure 205. Map of Wood Mill (red) within overall Deferiet Mills properties.

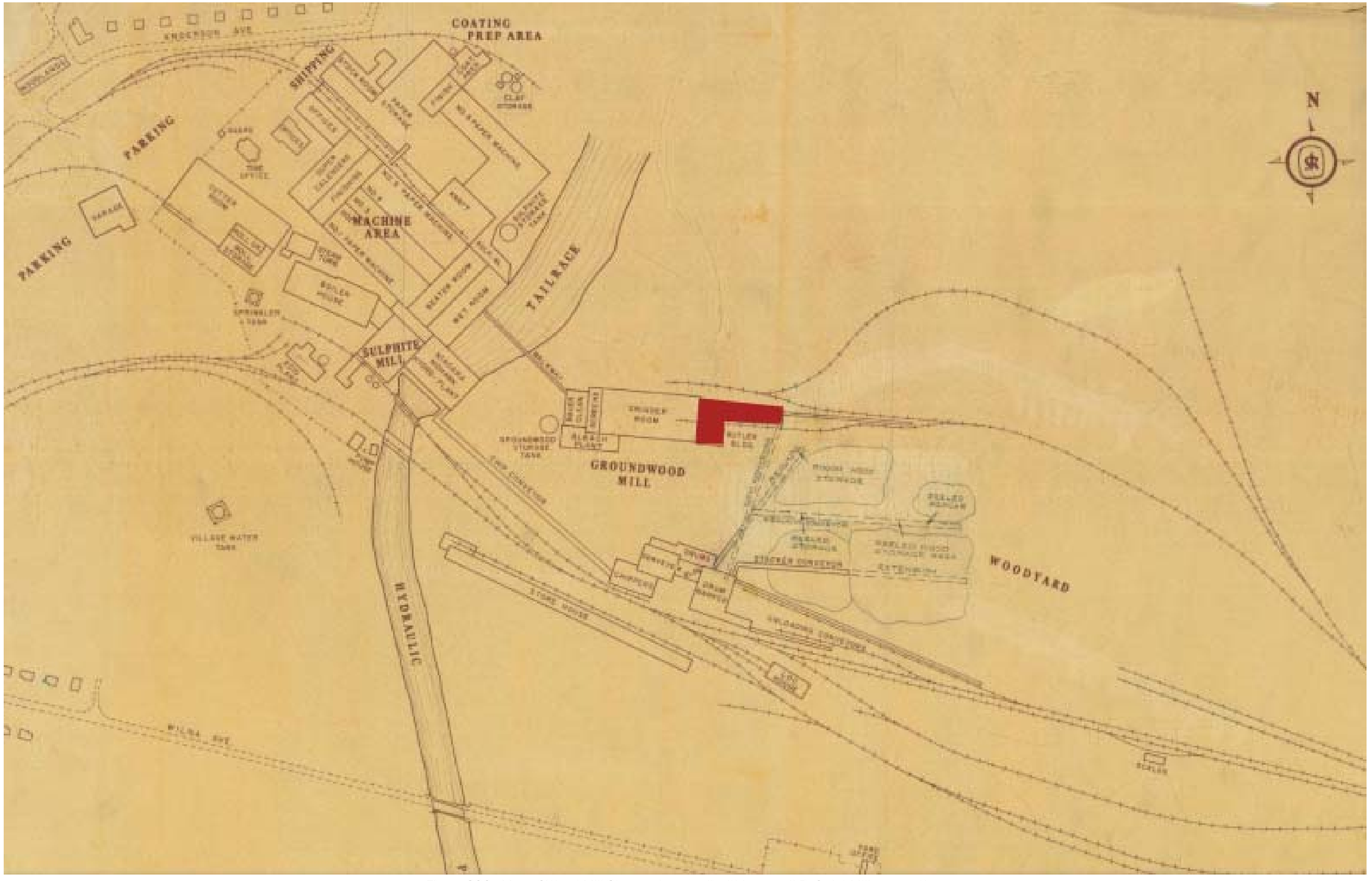


Figure 206. Map of Wood Mill Storage Area (red) within overall Deferiet Mills properties.

Pump House

Figure 207. Exterior of southeast elevation of Pump House from large Rail Road Bridge.

Figure 208. Exterior of east corner, northeast elevation, and southeast elevation of Pump House.

Figure 209. Exterior of northwest elevation of Pump House.

Figure 210. Exterior of northeast elevation of Pump House (left center), with surrounding sulfite mill (center), new Boiler Bldg (right center), paper mill (lower right), and Hydraulic Power Plant (lower left).

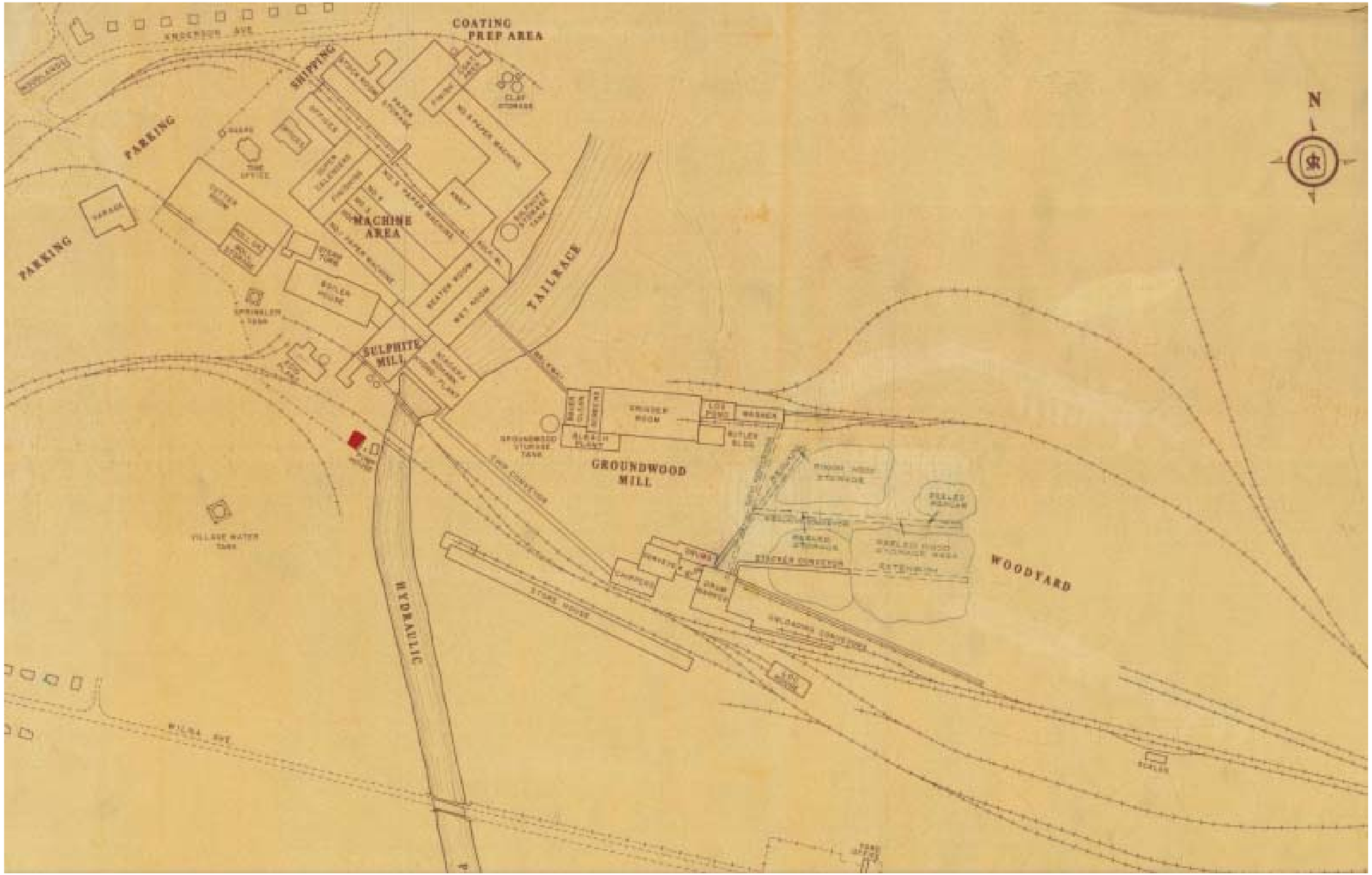


Figure 211. Map of Pump House (red) within overall Deferiet Mills properties.

Storage and Other Buildings near Mills

Figure 212. Exterior of south elevation of steel framed storage building.

Figure 213. Exterior of west elevation of steel framed storage building from large Rail Road Bridge.

Figure 214. Exterior of light fixture and structure of steel framed storage building.

Figure 215. Exterior facing east of Water Retention Tanks.

Figure 216. Exterior facing east of Water Retention Tanks.

Figure 217. Exterior of southwest corner of ruins.

Figure 218. Exterior of west side of ruins.

Figure 219. Exterior of ruins.

Figure 220. Exterior of ruins.

Figure 221. Exterior of abandoned Service Station.

Figure 222. Exterior of abandoned Service Station.

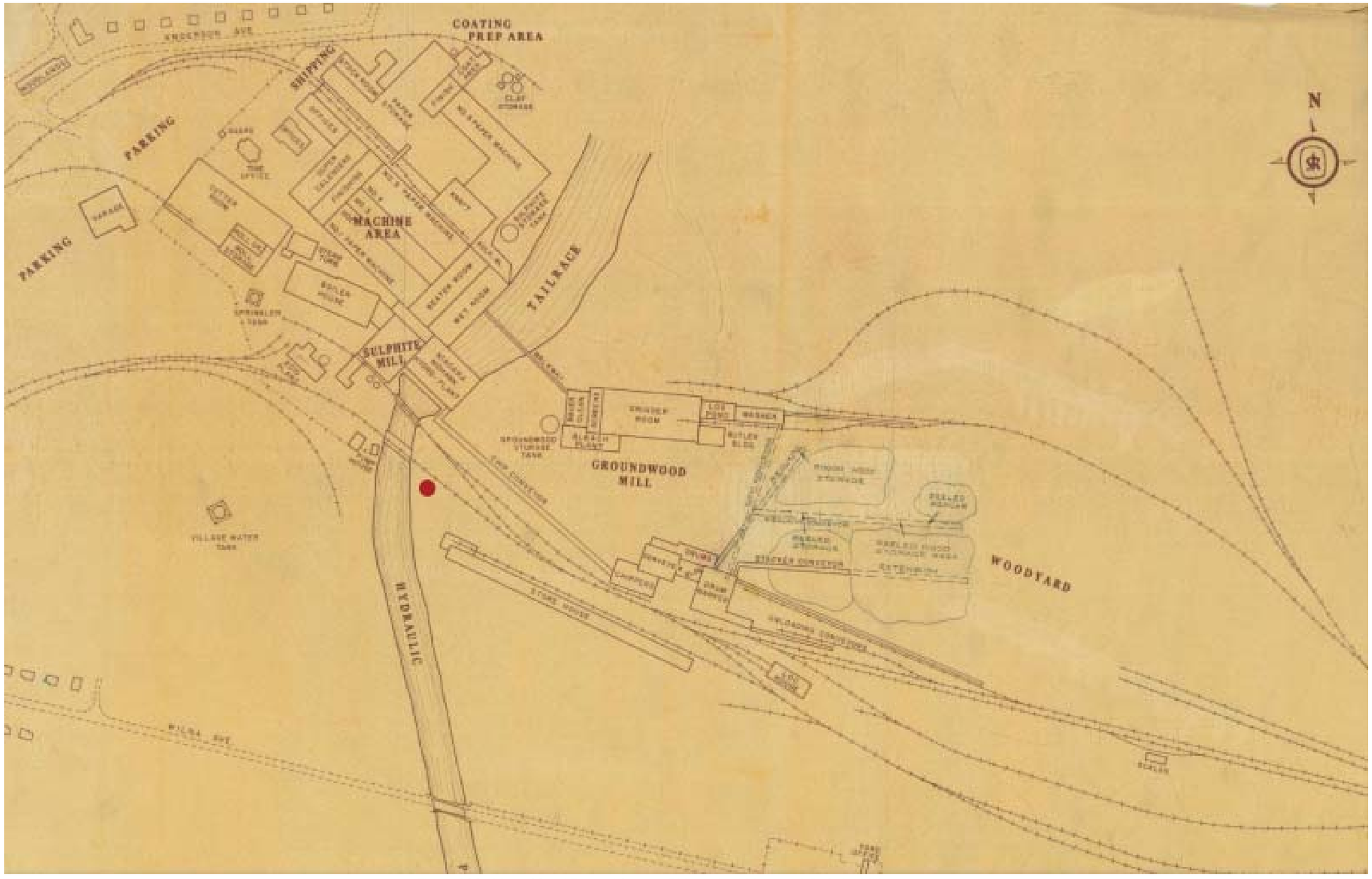


Figure 223. Map of Steel Framed Storage Bldg (red) within overall Deferiet Mills properties.

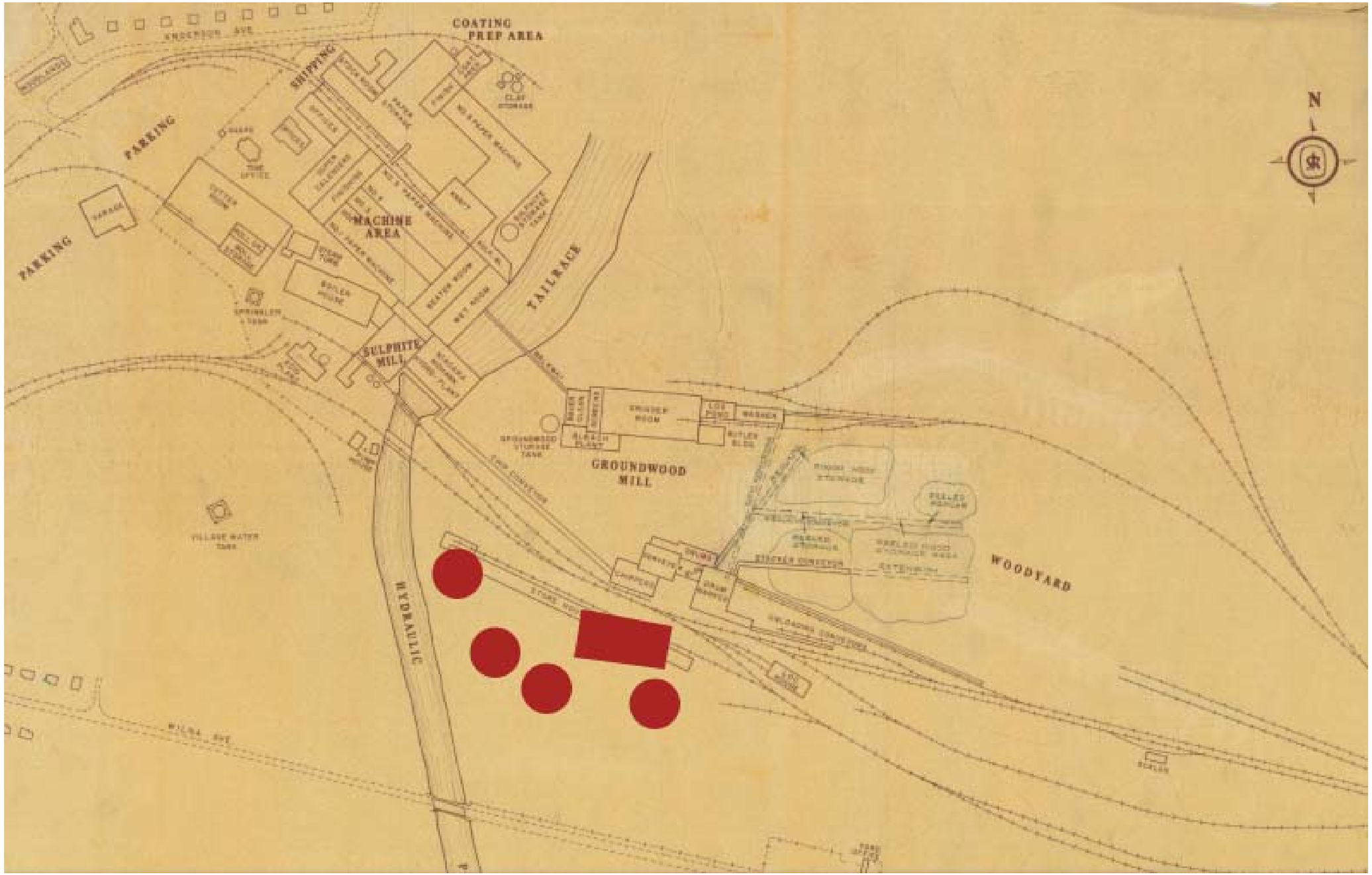


Figure 224. Map of Water Retention Tanks (red) within overall Deferiet Mills properties.

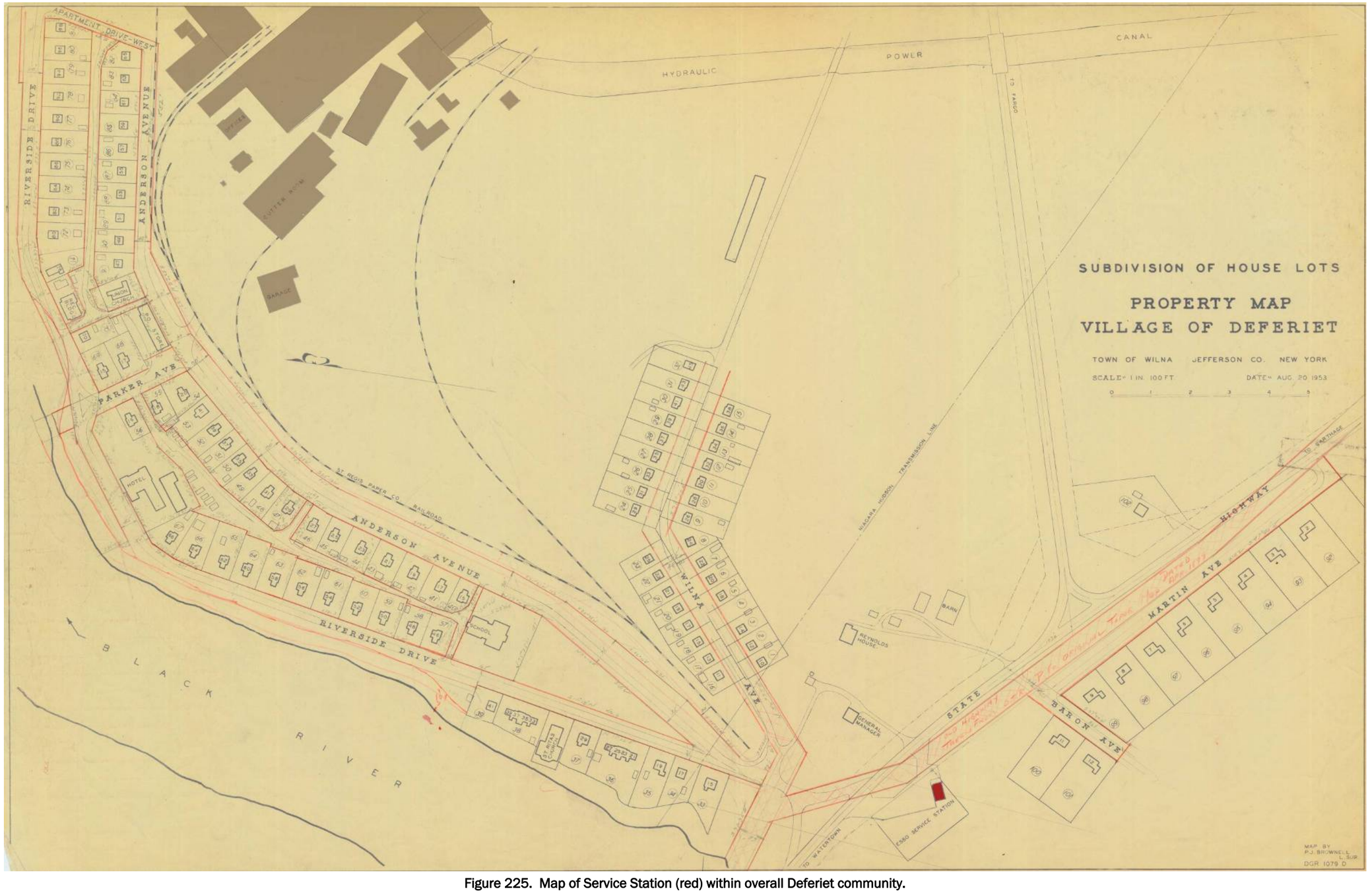


Figure 225. Map of Service Station (red) within overall Deferiet community.

Roads and Bridges

Figure 226. Exterior facing south from large Rail Road Bridge.

Figure 227. Exterior facing southeast from large Rail Road Bridge.

Figure 228. Exterior of small Rail Road Bridge and foundation (right, with Hydraulic Power Plant beyond) facing northeast from large Rail Road Bridge.

Figure 229. Exterior of small Rail Road Bridge (with Hydraulic Power Plant beyond) facing northeast.

Figure 230. Exterior of northeast elevation of Cutter Bldg (left), southwest elevation of paper mill (right), and southwest elevation of original Administration Bldg (right center), facing northwest.

School House

Figure 231. Exterior of south elevation of School House building.

Figure 232. Exterior of south elevation of School House building with adjacent Multi-Family Dwellings (left).

Figure 233. Exterior of south elevation of School House building.

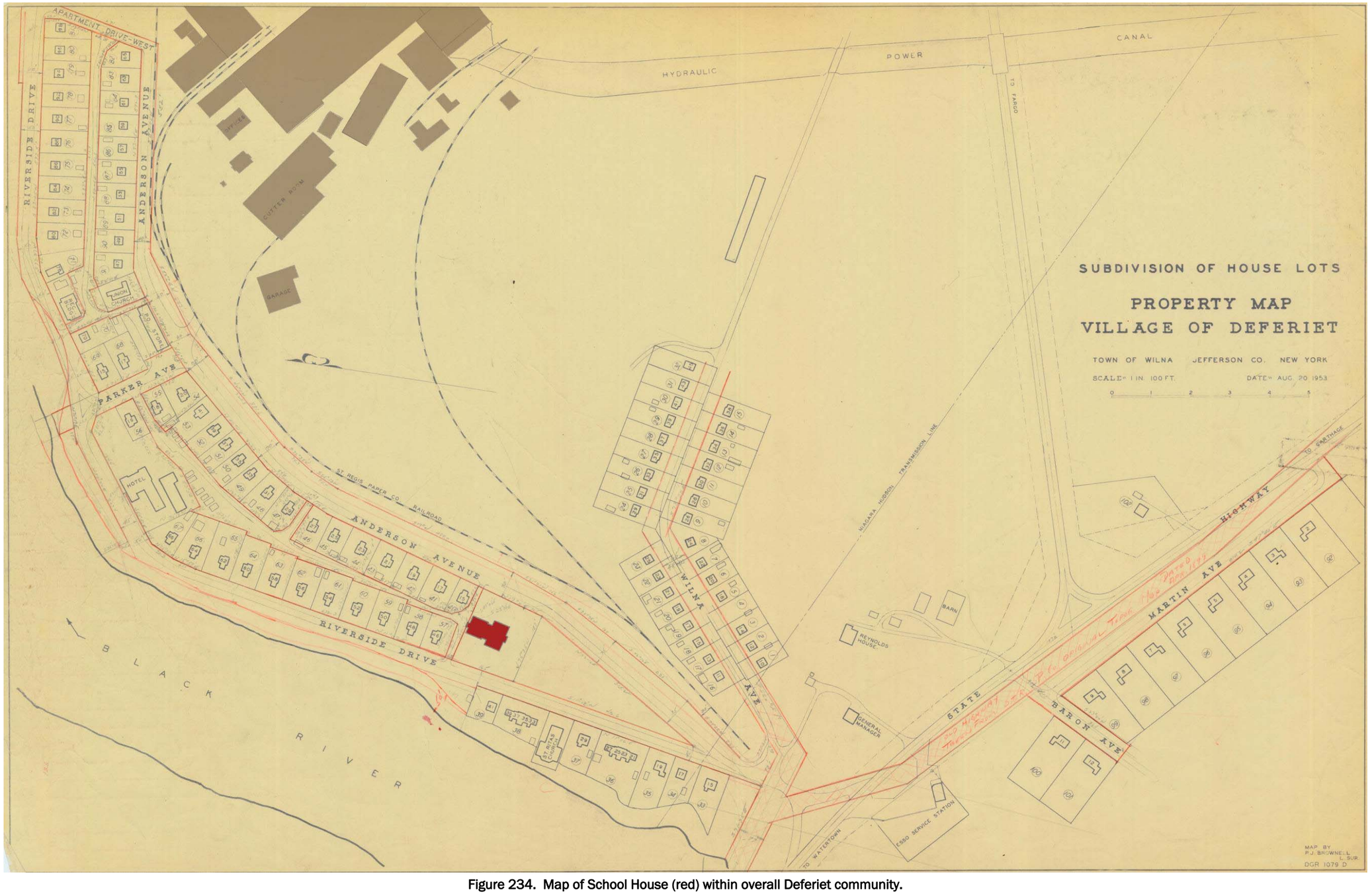


Figure 234. Map of School House (red) within overall Deferiet community.

General Store

Figure 235. Exterior of south corner of General Store.

Figure 236. Exterior of southwest elevation of General Store.

Figure 237. Exterior of southeast elevation of General Store.

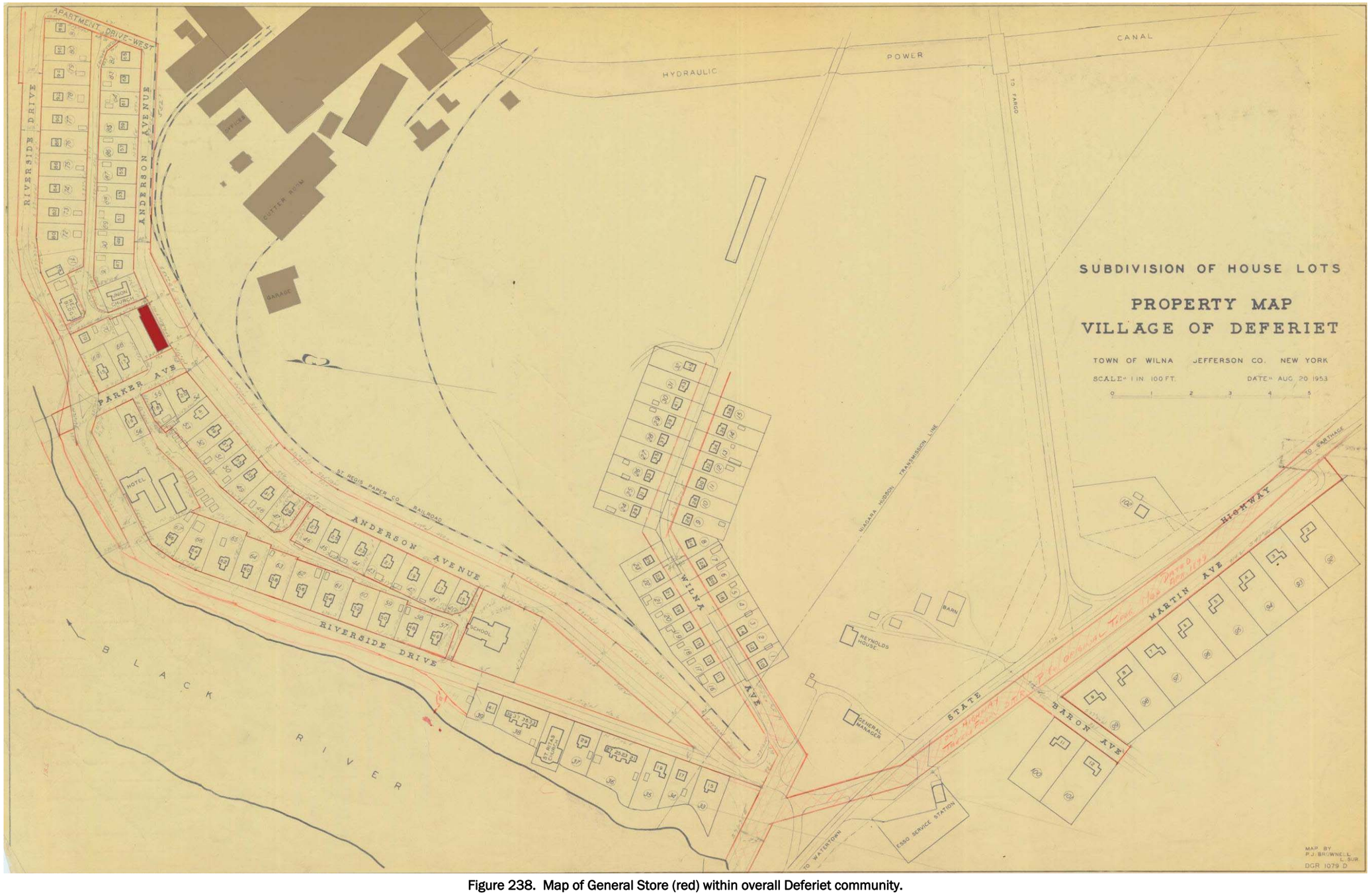


Figure 238. Map of General Store (red) within overall Deferiet community.

Hotel – St. Regis Inn

Figure 239. Exterior of elevation of new City Bldg/Fire Department, previously St. Regis Inn.

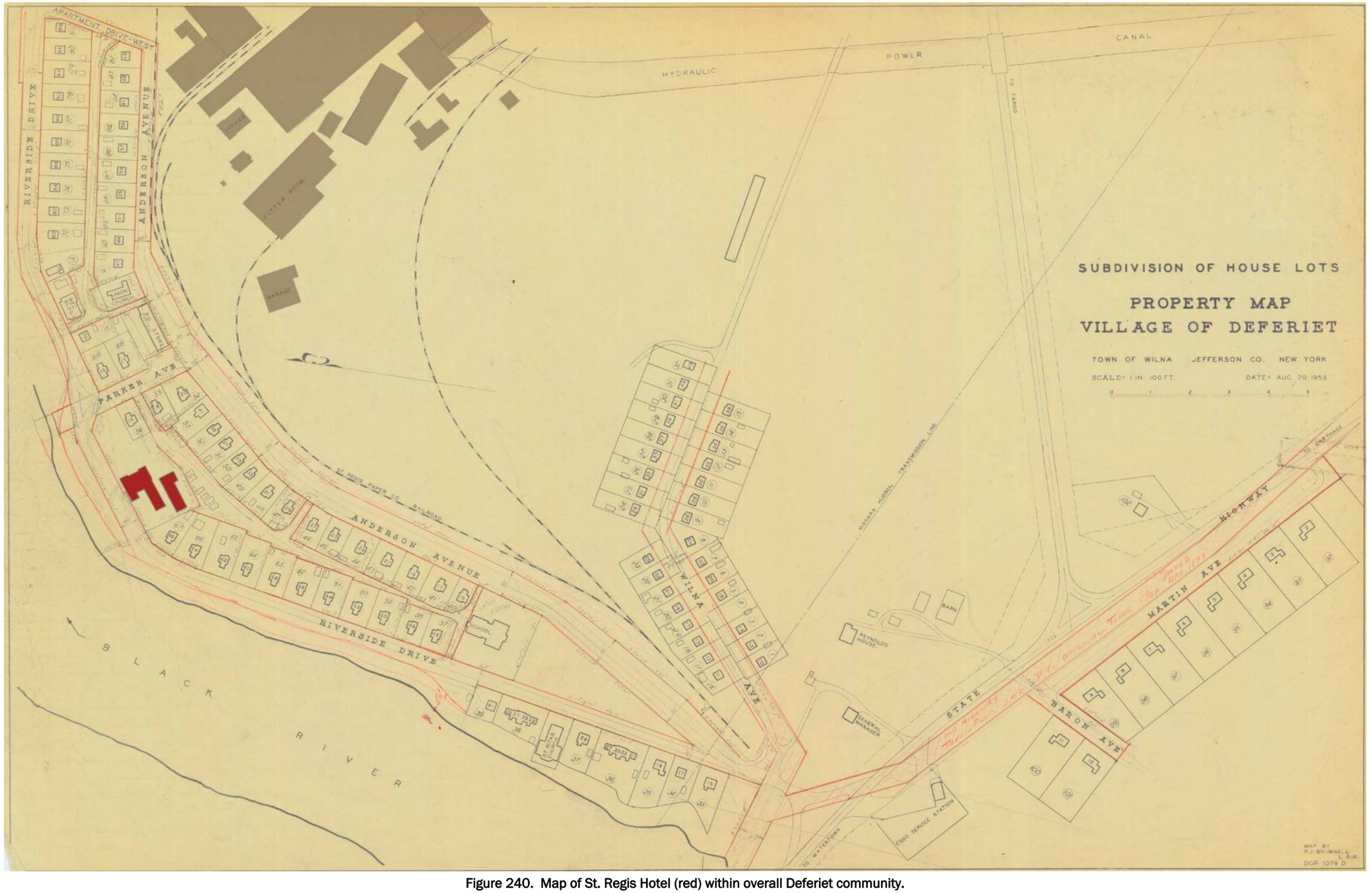


Figure 240. Map of St. Regis Hotel (red) within overall Deferiet community.

Recreation Center

Figure 241. Exterior of west corner (north and west elevations) of Recreation Center along east/south side of Riverside Drive.

Figure 242. Exterior of northwest elevation of Recreation Center along east/south side of Riverside Drive.

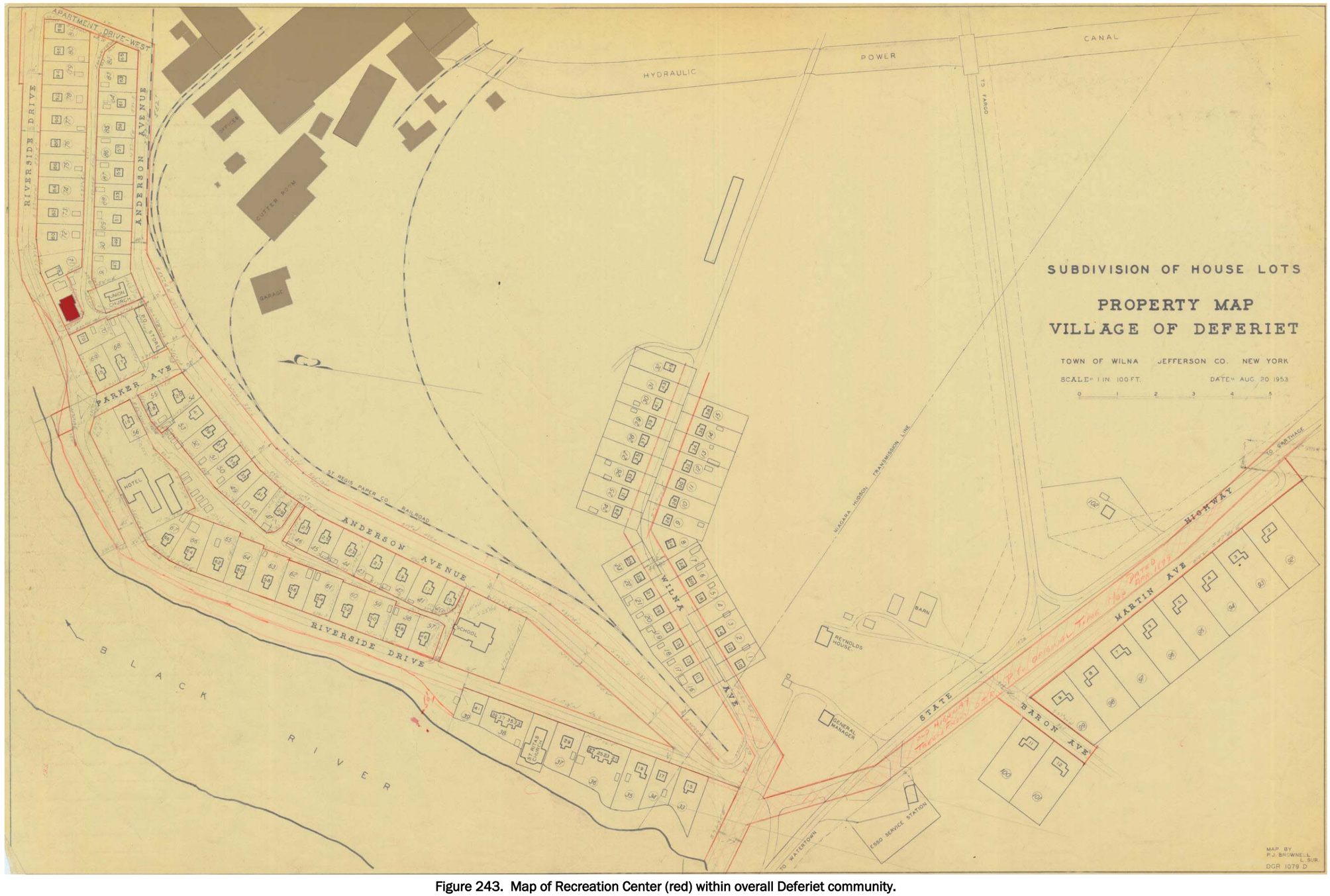


Figure 243. Map of Recreation Center (red) within overall Deferiet community.

Dwellings

Multi-Family Housing

Figure 244. Exterior of southeast corner of Multi-Family Dwellings (center), Church (left), and School House (right).

Figure 245. Exterior of southeast corner of Multi-Family Dwellings north of Church on Riverside Drive.

Figure 246. Exterior of northeast corner of Multi-Family Dwellings north of Church on Riverside Drive.

Figure 247. Exterior of east elevation of Multi-Family Dwellings north of Church on Riverside Drive.

Figure 248. Exterior of east elevation of Multi-Family Dwellings just south of Church on Riverside Drive.

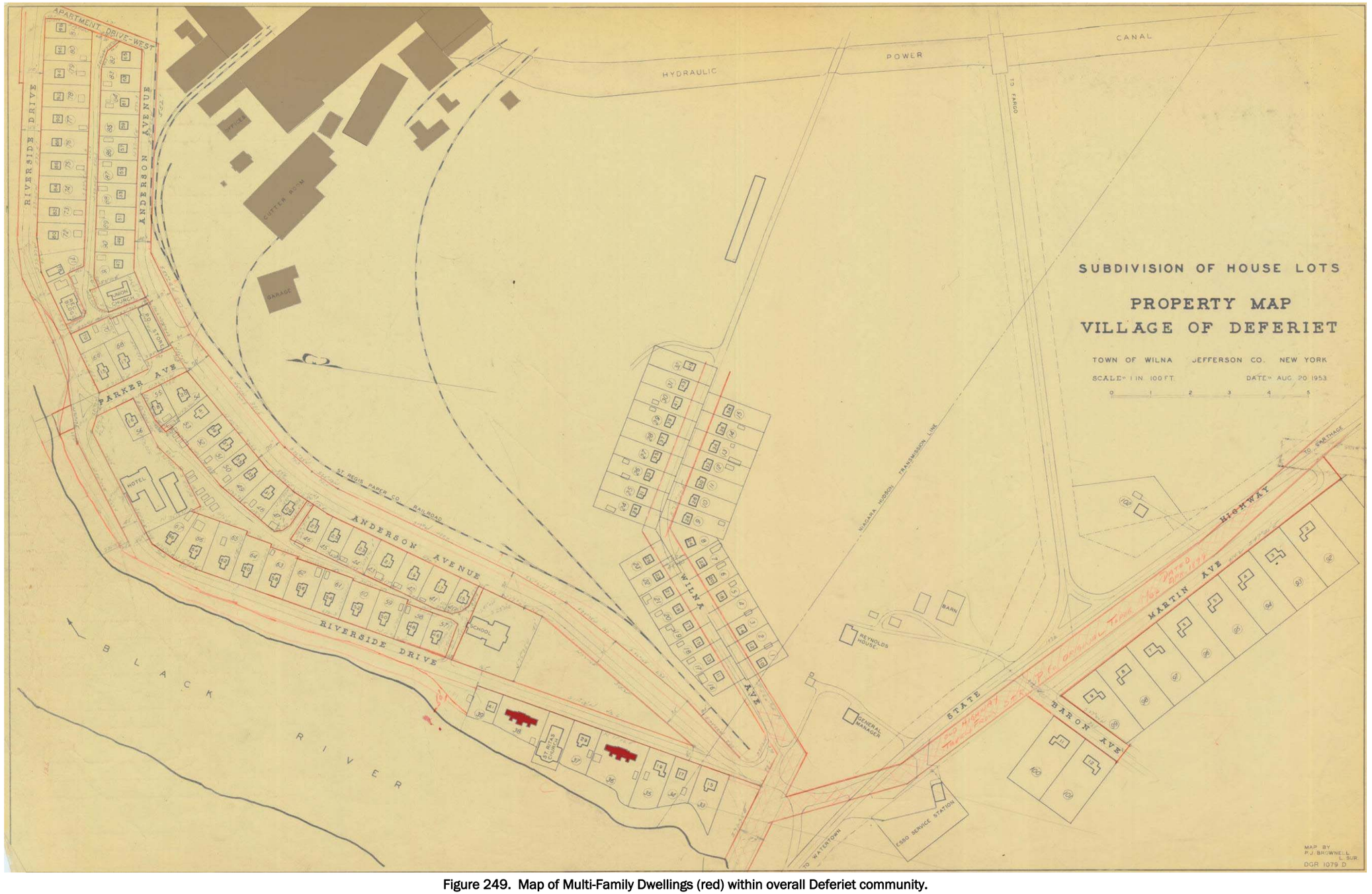


Figure 249. Map of Multi-Family Dwellings (red) within overall Deferiet community.

Single-Family Housing

Figure 250. Exterior of east elevation of Single-Family Dwelling adjacent (south) to Church on Riverside Drive (Fig. A on map).

Figure 251. Exterior of east elevation of Single-Family Dwelling at the intersection of Riverside Drive and Anderson Avenue (Fig. B on map).

Figure 252. Exterior of east elevation of Single-Family Dwelling north of Church on Riverside Drive (Fig. C on map).

Figure 253. Exterior (facing northwest) of Single-Family Dwellings along Anderson Avenue, north of School House (see Fig. D on map).

Figure 254. Exterior (facing southeast) of Single-Family Dwellings along Riverside Drive, south of City Bldg (see Fig. F on map).

Figure 255. Original exterior (facing southeast) of Single-Family Dwellings along Riverside Drive, south of Hotel.

Figure 256. Exterior (facing west across Anderson Avenue) of Single-Family Dwellings along Anderson Avenue, north of School House (see Fig. G on map).

Figure 257. Exterior of Single-Family Dwelling.

Figure 258. Exterior of Single-Family Dwelling.

Figure 259. Exterior (facing southeast) of northwest elevation of Single-Family Dwelling along the south/east side of Wilna Avenue (see Fig. H on map).

Figure 260. Exterior (facing southeast) of northwest elevation of Single-Family Dwelling along east/south side of Wilna Avenue (see Fig. K on map).

Figure 261. Exterior (facing northeast) of Small Single-Family Dwellings along north side of Wilna Avenue (see Fig. J on map).

Figure 262. Exterior of Small Single-Family Dwellings along Wilna Avenue.

Figure 263. Exterior of Large Single-Family Dwellings along south side of Martin Avenue/Rte 3 (see Fig. E on map).

Figure 264. Exterior (facing southwest) of Single-Family Dwellings on the northwest side of Anderson Avenue, at the intersection of Anderson Avenue (north/south) and Parker Avenue (east/west) (see Fig. L on map).

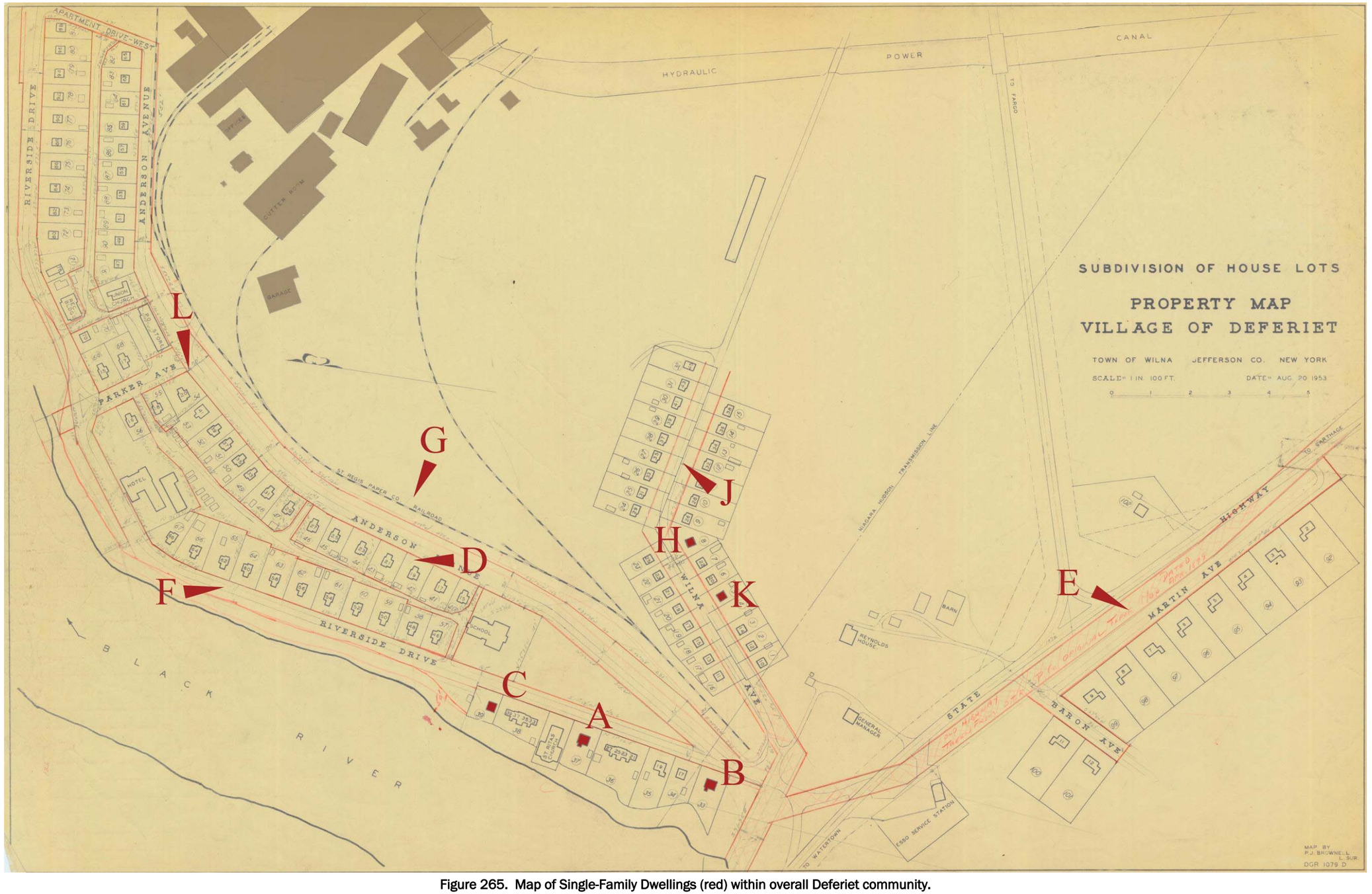


Figure 265. Map of Single-Family Dwellings (red) within overall Deferiet community.

Manager's House

Figure 266. Exterior of east elevation of Manager's House along Rte 3.

Figure 267. Exterior of northeast corner (north and east elevations) of Manager's House along Rte 3.

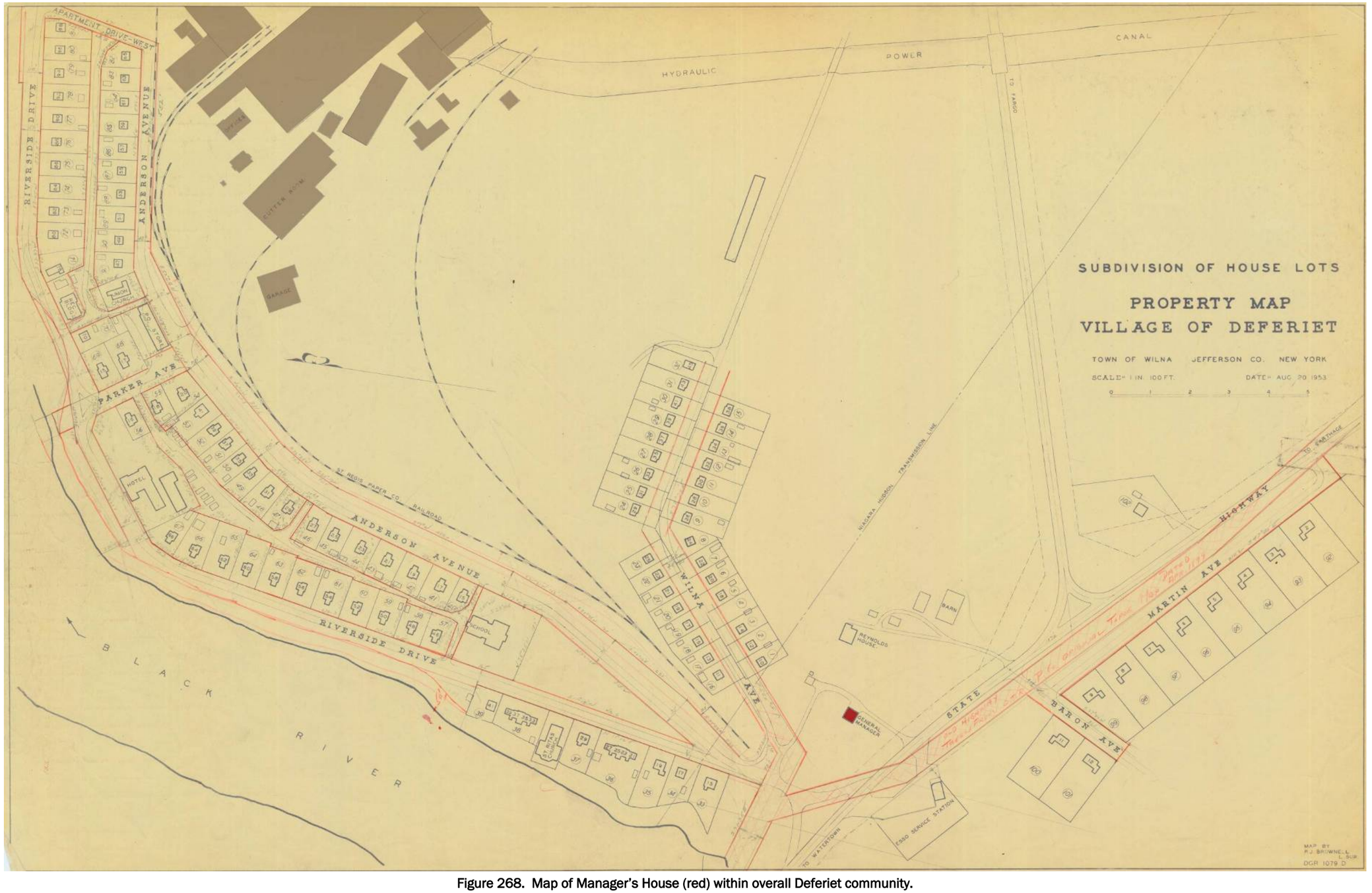


Figure 268. Map of Manager's House (red) within overall Deferiet community.

4 Environmental Survey Findings and Recommendations

Findings

Future Environmental Compliance

Under a lease agreement or property purchase, the Army will have to conduct its training operations following the same environmental compliance guidance that currently applies to the Fort Drum ranges and Cantonment Area, including (but not limited to) the control of hazardous materials, and the disposal of hazardous and nonhazardous wastes. The Fort Drum Public Works Environmental Division will be required to prepare (or modify existing) a storm water pollution prevention plan, spill control and prevention plans, and other documents required by State and Federal agencies for the site. If the property is purchased, potential subsurface contamination (discussed later in this report) will have to be mitigated prior to the purchase or addressed by the Army following purchase.

The primary concern for purchasing the property is the strong potential for existing subsurface contamination. A thorough environmental site assessment should be conducted to determine the existence and extent of such contamination. Any contamination that was found should be mitigated according to ASTM remediation standards. The following paragraphs list possible sources/locations of contamination.

The paper mill had been in operation for 100 years prior to its closure. During most of that period there were few environmental laws regulating the disposal of hazardous wastes. It is possible that wastes have been buried on the site and are a source of contamination of groundwater. Further, hazardous chemicals would have been stored by various means, and spill cleanup would have been unregulated thoughout much of the history of the mill. Note that in the early years, industrial wastewater, and perhaps other wastes would likely have been dumped directly into the millrace or adjacent Black River. While this practice would be clearly unacceptable today, it does reduce the possibility of wastes stored on site.

The vast majority of chemicals and waste products generated while the mill was operational were caustics for pulping and bleaching, wastewater from the paper process, and sludge from the wastewater treatment plant (WWTP). All of these elements were either dumped into the river long ago, or treated under permit at the WWTP. Over the years, the paper chemistry used by the mill became less aggressive, using hydrogen peroxide bleaching in the last few years of production. While there is always the possibility of small quantities of hazardous materials used in maintenance operations, for example, there is a low probability of large scale contamination with very dangerous materials. To illustrate, while there were polychlorinated biphenyl (PCB) transformers used at the mill, the environmental footprint from them is much smaller than if this site was a factory producing transformers.

Most of the chemical storage tanks have been cut open and cleaned out. However, one should always suspect residue remains (Figure 269), and take appropriate personal protective equipment (PPE) precautions based on the particular substance.

Figure 269. Caustic residue at the chemical storage building.

Figure 270. Ash pond overflow.

The ash pond that received wastes from the boiler plant is not lined, and is likely to be a source of contamination to underlying soil and groundwater. The New York State Department of Environmental Conservation required that the Site develop a plan for a hydrogeological investigation, and submit it to the State for approval. CERL was told that this plan was completed. However, CERL found no evidence of groundwater monitoring wells during the site visit, so it is unlikely that the plan has been implemented.

The coal pile site also has no barrier underneath, and is likely to be a source of contamination to underlying soil and groundwater. The paper mill owner was also required to develop a hydrogeological investigation plan for this site, but it was not known whether the plan was completed. CERL found no evidence of any monitoring or remediation activity.

Both the ash pond and coal storage areas directed excess rainwater runoff to the industrial WWTP through an overflow structure and pump while the mill was operational (Figure 270). As those systems are now shut down, it is assumed that stormwater makes its way to the Black River. Depending on environmental sampling and hydrogeological information, this might be a significant future compliance issue.

The original site had numerous liquid storage tanks, other metal structures, and wood structures that would have required painting. Considering the age of the facility, lead based paint was undoubtedly used, and residuals of that paint probably remain in the soil. A large above ground fuel oil tank was located to the south of the boiler house. The steel tank is gone, the concrete pad remains, and one would suspect soil contamination in the area (Figure 271).

A fire-fighter training area had been located in the eastern portion of the nonindustrial area. Extinguishing Petroleum, Oil, and Lubricants (POL) fires was part of the training, and could have caused POL contamination of the site. There was once a metal trough for this purpose. Currently, a large tank and truck box are at this location (Figure 272). Industrial wastewater piping was often metal, and corrosion damage was caused by the chemicals in the process wastewater. Leakage of process wastewater into the sub-surface undoubtedly occurred. Also, leakage could have occurred from the numerous pits, sumps, and trenches thoughout the paper mill.

PCB transformers and capacitors have been used on the paper mill site. Mr. Mike Zecher, a former mill electrician, stated that all PCBs have been removed from the site, and that any contamination from leaks or spills has been mitigated. However, sampling to verify that PCB contamination does not exist is recommended. In particular, there is a scrap yard area to the east of the mill where excess equipment (including transformers) was stored before scrapping or cannibalizing (Figure 273). Existing substations are under the control of Brookfield Power, and should be strictly off-limits.

Two maintenance facilities were in use on the property. One is the “roundhouse” where locomotives were maintained (Figure 274). Soil around the perimeter of this building could be contaminated by solvents, POL, etc. According to the former Industrial Wastewater Treatment Plant operator (current Village DPW Superintendent) Mr. Mike Bigness, the interior drains in this building discharged to a sump from which the wastewater was pumped to the treatment plant. This could not be verified as the area where the sump is supposed to be is now covered with several feet of excavated soil. The second is the “garage,” where presumably cars and trucks owned by the paper mill were maintained. According to Mr. Bigness, the drains in this building flowed to the sanitary sewer.

Figure 271. Foundation of fuel oil tank.

Figure 272. Location of fire training area and scrap yard.

Figure 273. Debris at the scrap yard.

Figure 274. Maintenance trench in "roundhouse."

Safety and Health

Utilities

There is not an operational sanitary sewer or water service on the site. Unless the existing abandoned systems are restored and reconnected to the Village systems, the Army will have to provide potable water and portable latrines for civilian and military personnel assigned to the site. Any other wastewater generated by the Army on the site would have to be collected and disposed off-site at a location permitted to receive transported wastewater. There is no electric service, currently. The lack of lighting is a safety concern. The interiors of many of the buildings are quite dark. Should an accident occur, there must be a method of providing adequate lighting so that rescuers can quickly find and assist the victim.

Hazardous Materials

Friable asbestos still exists within the industrial buildings, though most of the original asbestos has been removed. The 2007 asbestos survey report noted that friable asbestos was present in the debris covering the floors of the wood grinding area. Movement of soldiers through this area could resuspend settled asbestos fibers. The Army should make the wood grinding area off limits to soldiers until the area is cleared of asbestos. All flooring should be cleaned to remove dust containing asbestos fibers that settled

during demolition. Table 1 summarizes the findings in the 20 08 report (refer to figures in the 2007 Asbestos report showing the site layout for Locations and Areas).

Because of the age of buildings on the site, any paint is likely to contain lead, or possibly other hazardous constituents. The Army should refrain from training activities that would tend to abrade painted surfaces, or cause lead paint particles to become airborne.

Sediment in the ash pond and the coal storage site may contain heavy metals, and perhaps other contaminants. Surface samples should be taken to determine if the materials are hazardous. Unless there is a compelling training rationale, these areas should be off limits to soldiers until the areas are proven to be nonhazardous, or have been remediated. The concern is less about soldier health than a desire to not complicate clean-up responsibility.

Table 1. Locations of friable asbestos.

LOCATION	AREA	ASBESTOS TYPE
Super Calendar Room	A-2 Heat exhaust fan room at south end	Asbestos paper wrapped duct insulation over nonasbestos fiberglass
Paper Machine Bays 1 and 2	Old steam line – mid section of north wall	White fibrous pipe insulation
Cutter Room Bldg	Areas 1-6, 1-7, 1-12, 1-13, and 1-19	Mudded fittings to pipes
Cutter Room Bldg	Area 1-4	White paper insulation under black paper coating
Ground Wood Complex, Cleaner and Screen Rooms	Area 1-37	Asbestos white paper insulation under black paper, and mudded fittings
Bleach Plant	Areas 1-34 and 1-35, lower levels of partially demolished bleach plant	Asbestos white paper insulation under black paper, and mudded fittings; asbestos containing materials (ACM) are mixed in with piles of debris
Grinder and Turbine Rooms	Area 1-30, along east wall and NW	White paper insulation and mudded fittings; and ACM mixed in debris on floor
Log Pond and Debarking Room	Areas 1-10 and 2-1	White pipe insulation under black paper, and mudded fittings
Log Pond and Debarking Room	Area 1-39	Transite, roofing material, and pipe insulation in piles of debris on floor and on dangling pipes
Dewatering Building	Area 1-14	White pipe insulation under black paper, and mudded fittings
Dewatering Building	Area 1-12 and 1-14	Mudded pipe fittings

There is considerable water damage in the northern-most Mill Office Building (just south of the rail head), causing extensive growth of mold and decay of materials left in the building. It is recommended that the Army not use this building until leaks and structural damage has been repaired, and a thorough cleanup of the mold has been completed.

Physical Environments

The interior of most of the buildings are filled with trip and fall hazards, including debris throughout the buildings and gaping holes in the floors of the paper machine rooms due to removal of paper machines, tanks, and other equipment (Figures 275 and 276). Fall hazards are clearly the most serious and immediate safety hazard. However, these dangers can be mitigated by soldier awareness, and may be viewed as enhancing training rather than as hazards. The Fort Drum Safety Office should develop a safety plan for operations at the site. One option to mitigate fall hazards would be to restrict activity to the basement level of the paper machine buildings (Figure 277).

Figure 275. Hole in floor from removal of paper machine.

Figure 276. Hole in floor from removal of tank.

Figure 277. Basement.

Several exterior walls have been damaged during scavenging operations, leaving unsupported masonry (Figure 278). This structural danger cannot be mitigated by soldier awareness. These openings should be repaired or made off limits.

Fall hazards are greatly exacerbated by the removal of safety railings, apparently by the owner for scrap value. At the WWTP, most of the equipment, metal superstructure, and safety railings have been removed (note the yellow stubs in Figure 279). Also, due to salvage and demolition activities, any metal staircase throughout the mill should be assumed unsafe unless inspected. The Black River, millrace, cross-race utilities, and hydro plant pose obvious fall and drowning hazards; all should be off limits. The buildings are open to the elements, which poses several issues:

- leaking roofs will continue to deteriorate causing wet / snowy indoor conditions, and eventual structural collapse unless mitigated
- snow blowing into the mill buildings' interior can hide trip/fall hazards
- bird and animal droppings will accumulate, and cause a health hazard.

Other Considerations

The Deferiet water well on the north edge of the property requires a 400-ft radius clear area around the well, and 24/7 access by the Village of Deferiet. The Deferiet water pipeline from that well crosses the nonindustrial area of the site, and the southwest portion of the mill built-up area; and is constructed of a material that has become fragile. The Army should not allow heavy tactical vehicles to drive over this pipeline, or use explosives in close proximity. Figure 280 shows the approximate location of the Village water line on a 1953 map of the property. A high resolution version of this map is available. The 1953 map also indicates that much of the northeast open area of the site was Army property until 1948.

Brookfield Power will require continued access to the active hydroelectric power plant on the site. For this reason all training exercises should be coordinated with both Brookfield Power and the Village of Deferiet. The access road to the hydro plant (on the north the boiler house, Figure 281) and the hydro plant itself should be off-limits.

The perimeter fence is in disrepair. The entire site, or the portion that the Army is proposing to use, must be secured to Army standards.

Figure 278. Hole in exterior wall of boiler house.

Figure 279. Basin at WWTP, safety railings removed.

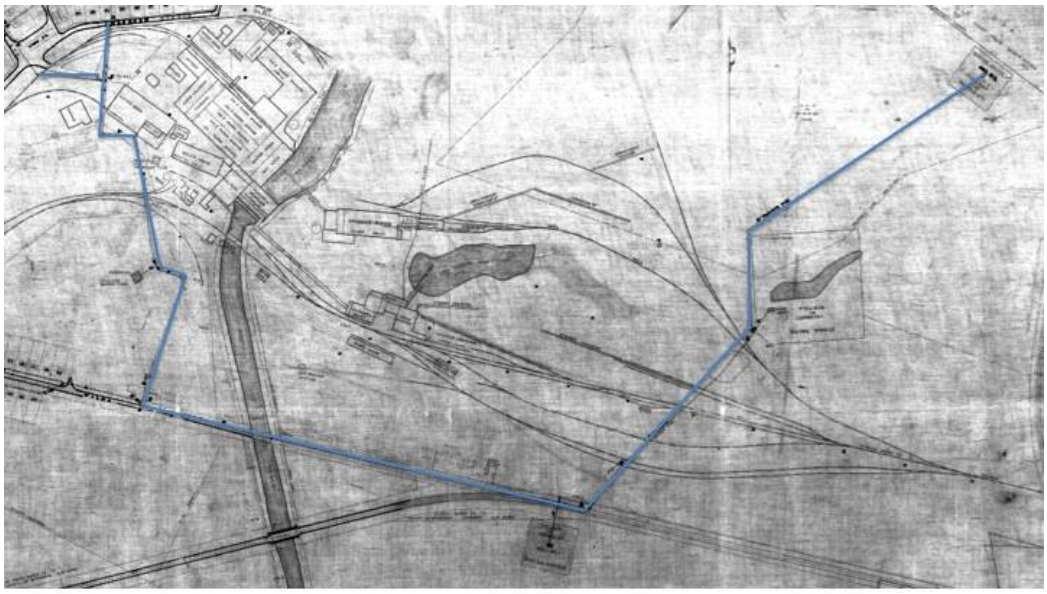


Figure 280. Location of village water line.

Figure 281. Passage to hydroelectric plant.

Recommendations

Prior to Leasing or Purchasing Property

1. A lease agreement should stipulate pre-existing environmental conditions.
2. Structures in the industrial area of the paper mill site should be evaluated by a structural engineer to determine if the structures themselves present a danger to soldiers.
3. The Army should carefully evaluate what specific areas of the property will be used for training. All other areas should be deemed off-limits by default.
4. Any chemicals, fuels, POL, etc. brought to be used by the Army must be carefully inventoried going onto and from the property to reduce the chance for the Army being blamed for pre-existing contamination.
5. Unless the existing abandoned system is upgraded, the Army will have to provide portable latrines for personnel on the site, and collect any other wastewater generated for disposal off-site.
6. The Army should refrain from training activities that would cause lead paint particles to become airborne.
7. The coal pile and ash pond areas should be off limits to soldiers until the areas are proven to be nonhazardous, or have been remediated.
8. Do not use the Mill Office Building until leaks and structural damage have been repaired, and a thorough cleanup of the mold has been completed.
9. The Fort Drum Safety Office should develop a safety plan for operations at the site.
10. Wall openings where there is unsupported masonry overhead should be repaired or made off limits.
11. The Army should not allow heavy tactical vehicles to drive over the Village of Deferiet water pipeline, nor should it allow the use explosives in close proximity to the water pipeline.
12. All training missions should be coordinated with both Brookfield Power and the Village of Deferiet.
13. The entire site should be secured to Army standards.

Prior to Purchasing Property

1. A thorough environmental site assessment should be conducted to determine the existence and extent of sub-surface contamination.
2. Any contamination that was found during the site assessment should be mitigated according to ASTM remediation standards.
3. It would be desirable to purchase only the areas for which there is a training use. There is no advantage for the Army to purchase property with an environmental liability, for which there is no training use.

5 Architectural Survey Findings and Recommendations

The identification of historically significant properties can be achieved only through evaluation of their position within the larger historic context. According to the National Register of Historic Places (NRHP), historic contexts are defined as "... the patterns, themes, or trends in history by which a specific occurrence, property, or site is understood and its meaning (and ultimately its significance) within prehistory or history is made clear" (National Register Bulletin #15, page 7). A historic property is determined significant or not significant based on the application of standardized National Register Criteria within the property's historical context.

This report contains a survey of a 1900 Paper Mill and a small Village located adjacent to the paper mill. The St. Regis paper mill and the Village of Deferiet are located near Fort Drum, NY. The St. Regis Paper Company began in Deferiet, NY, in 1899 and developed into a large venture at the Village of Deferiet. The achievement encompasses not only an immense hydraulic canal and a group of gigantic mill buildings, but a new village, with a new school house, store, public hall and hotel; all model structures built within 2 years on a spot that was fallow land stretching along the bank of the stream whose rushing waters powered the mill.

Criteria for Evaluation

The NRHP Criteria for Evaluation describe how properties and districts are significant for their association with important events or persons (Criterion A and Criterion B), for their importance in design or construction (Criterion C), or for their information potential (Criterion D). The following is a brief description of each of the four NRHP Criteria for Evaluation (excerpted from *National Register Bulletin #15: How to Apply the National Register Criteria for Evaluation*):

A. Event— associated with events that have made a significant contribution to the broad patterns of our history; or

B. Person— associated with the lives of persons significant in our past; or

C. Design/Construction—embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or

D. Information Potential—yielded, or is likely to yield, information important in prehistory or history.

Significance

The findings of this report will be discussed under the two components of NRHP eligibility: Significance and Integrity. The period of significance will either be 1899 to 1954, when St. Regis sold off Deferiet to the residents, or from 1899 to 1984, when St. Regis was purchased by Champion.

From the investigations, it appears the St. Regis Paper Mill, more commonly known as the Deferiet Paper Mill, is potentially eligible and is a nationally significant property under Criterion A: Event and Criterion C: Architecture.

A. Event—associated with events that have made a significant contribution to the broad patterns of our history.

The St. Regis Paper Mill was developed in 1899 and opened in 1901 by a consortium of papermakers from Watertown, NY. It was one of the first paper mills to combine all aspects of papermaking from de-barking, chipping, sulphiting, pulp-making, and finally paper making. The paper making company that developed out of the St. Regis Paper Mill became one of the largest paper making concerns in the country and one of the largest in the world. St. Regis was headquartered in Watertown, NY before it moved its headquarters to New York City. St. Regis Paper Company would cease to exist by 1984 when it merged with another large paper manufacturer, Champion.

B. Person—associated with the lives of persons significant in our past.

The available historical records provided no indication that the studied properties were in any way associated with the life of an individual significant in U.S. history.

C. Design/construction—embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction.

The St. Regis Paper Mill was designed by E.D. Jones Son's Co. of Pittsfield, Massachusetts, with extensive experience in mill construction. It was one of the first and one of the largest brick mills in the entire North Country (Figure 282). The mill and the Village are directly linked (Figures 283-285). The paper company built the worker housing (52 residences), the general store (Figure 286), the hotel (Figure 287), and possibly the school (Figure 288). This is one of the largest mill worker housing developments in the North Country.

John W. Griffin was the Supervising Architect for all the mill construction and also designed the houses, the hotel, store and public hall, school house and all other village structures.

Many of the buildings at the St. Regis Paper Mill lack architectural distinction and are not individually significant under Criterion C.

St. Regis Paper Mill and the Village of Deferiet were also looked at as a potential historic district per the guidelines in Criterion C. According to the NRHP, "Districts must be a unified entity and possess a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (National Register Bulletin #15, page 17). It was determined that, since the St. Regis Paper Mill has undergone too many alterations including additions to original buildings and significant removal of building components and equipment parts, the mill itself does not form the "significant concentration" as required under the NHPA and was not eligible in its entirety as a historic district. (However the mill village may be eligible on its own as a historic district.)

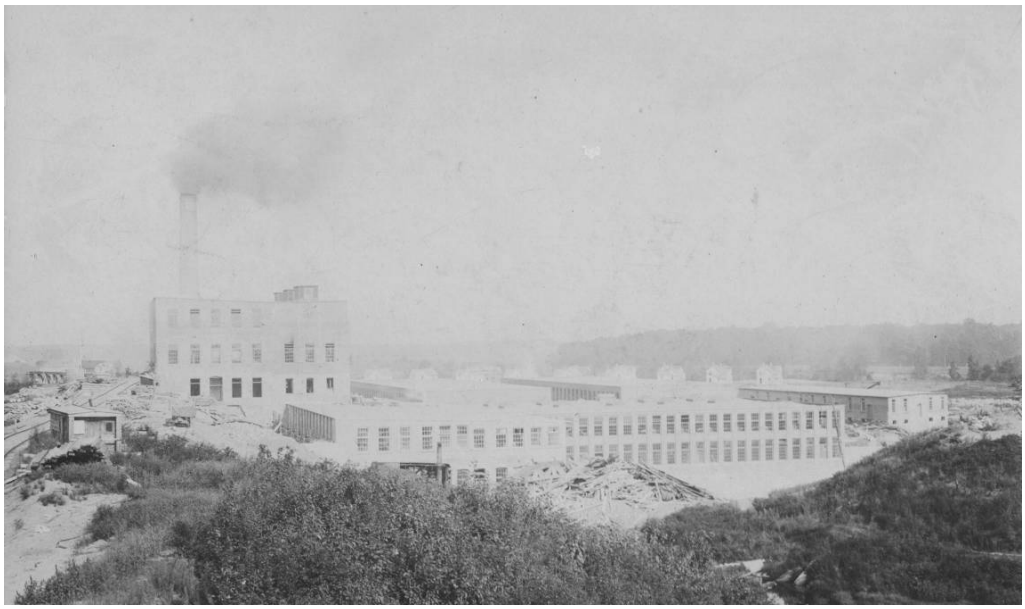


Figure 282. Historic view of the mill.

Figure 283. Aerial of St. Regis Mill (upper right) and surrounding Deferiet residential community.

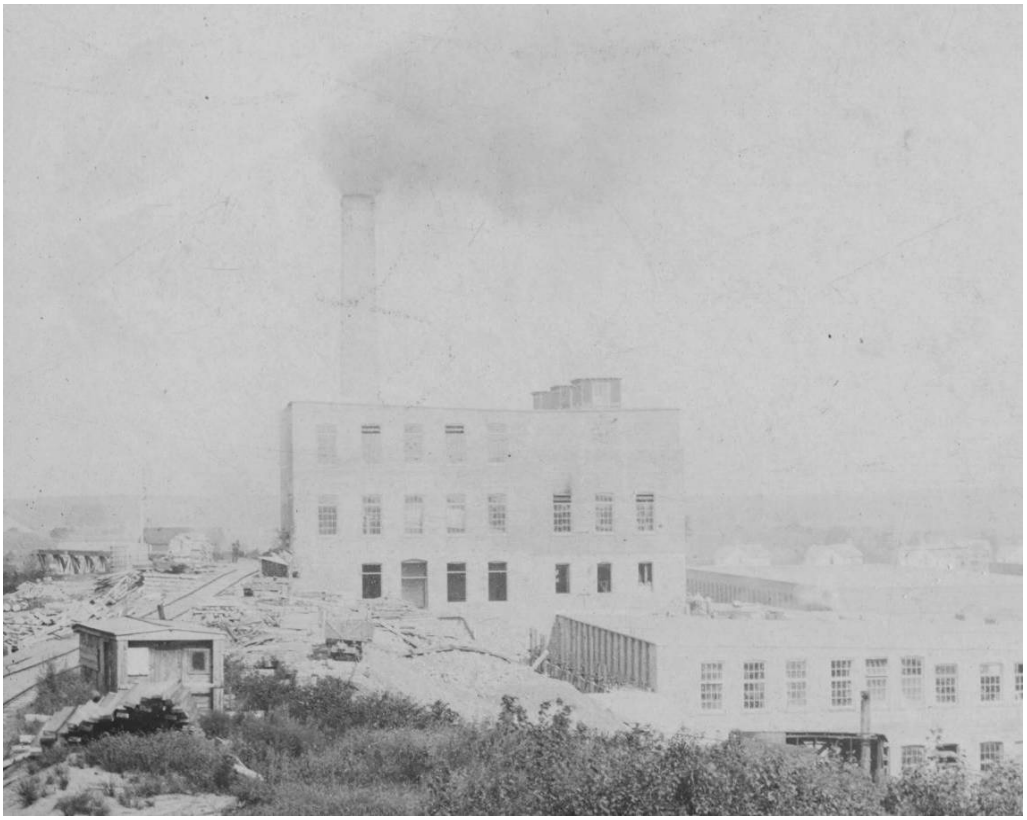


Figure 284. Historic view of the sulfite mill.

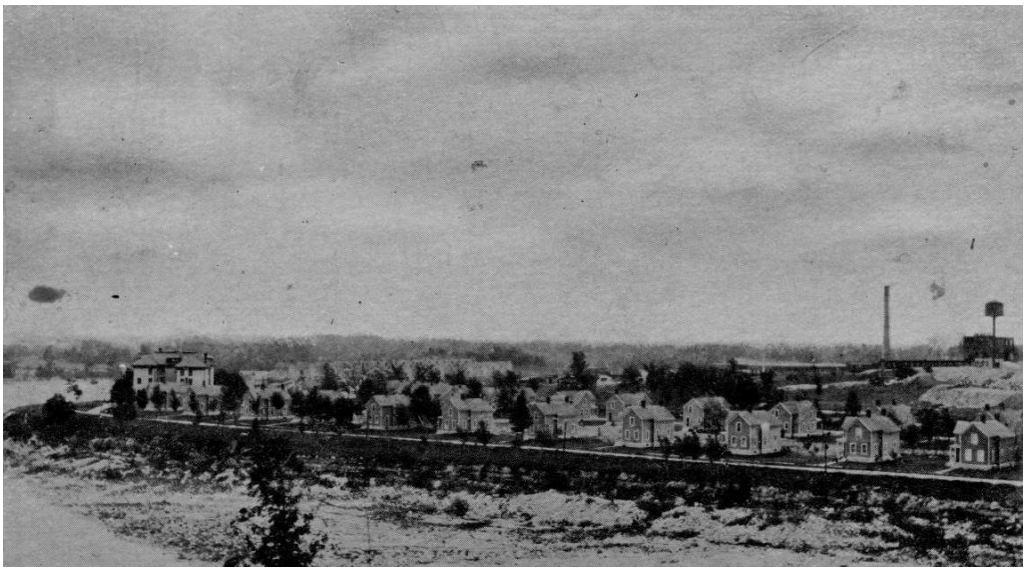


Figure 285. Birds-eye view of the village of Deferiet.

Figure 286. Historic view of the general store at Deferiet.

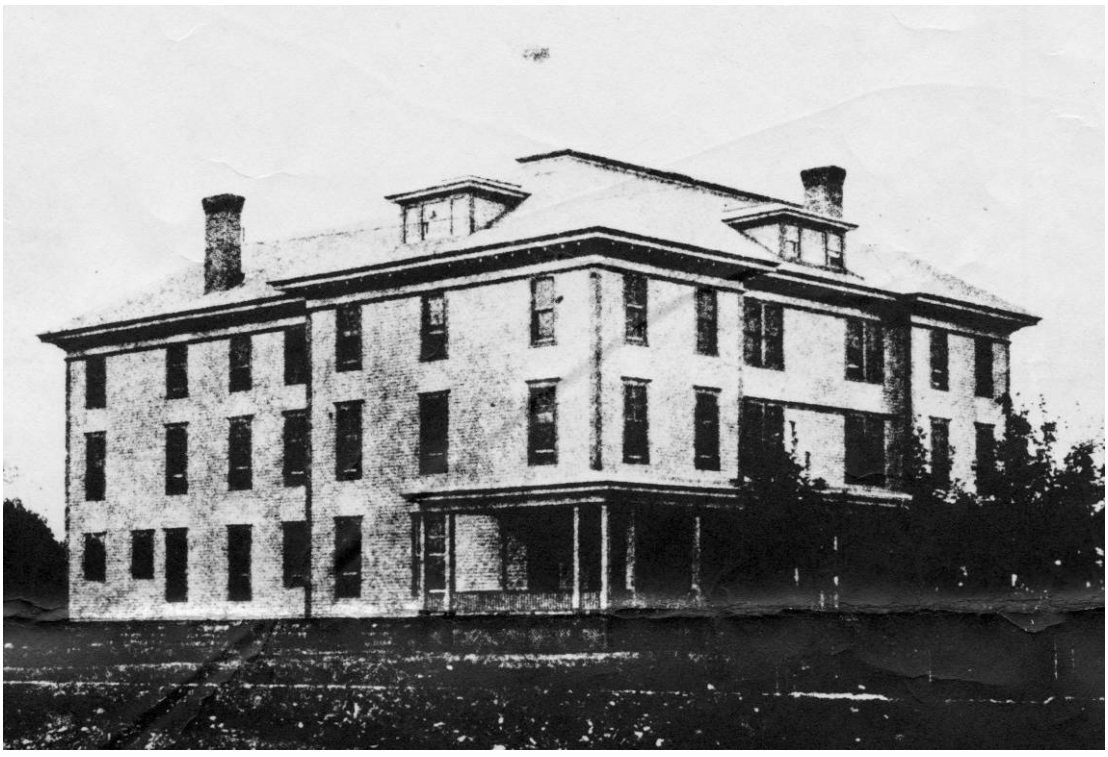


Figure 287. Historic view of the St. Regis hotel.

Figure 288. Historic view of the school and a row of residences.

D. Information potential—yielded, or is likely to yield, information important in prehistory or history.

The available historical records provided no indication that the study properties have yielded, or were likely to yield, any information important in prehistory or history.

State or local significance

The available historical record gives indication that the buildings at St. Regis Paper Mill and the adjacent Village of Deferiet have significance in a local or state context. Design and construction documents indicate that virtually all properties under study were of importance in the development of the paper mill industries in the North Country. The mill was one of the paper mills to combine all aspects of paper making. The successful and nationally recognized St. Regis Paper Company started its roots in the Deferiet/Watertown area. The Village of Deferiet is one of the largest mill worker housing developments in North Country. The involvement of local architects, engineers, fabricators, and contractors to address site-specific conditions were used at the time of construction.

Character defining features

Once the research team determined the buildings that were significant, it researched these buildings to see how they fit into their particular contexts and the integrity of each building per the guidelines in Criterion C.

The character defining features of a building depend on the associated NRHP Criteria and the associated property type. The character defining features for the St. Regis Paper Mill and the Village of Deferiet are those essential features that are necessary to understand and interpret the mill and village from its period of significance. This is a general list of character defining features for all plan types.

Mill Features:

- brick walls for the mill buildings
- window types and fenestration
- smoke stacks
- original boiler house
- the layout of the landscape in relation to the paper making process
- a complete self-contained complex.

Village Features:

- crescent-shaped layout of the village
- open, public area in front of the school house
- variety of residential buildings, including single-family and multi-family dwellings
- wood siding on dwellings with wood double-hung windows
- support buildings needed for the village such as store house, school house, churches, and hotel
- the connection and relation of the village to the mill both visually and physically.

Aspects of integrity

In addition to possessing historical significance, a property must also retain sufficient physical integrity of the features that convey its significance to be eligible to the NRHP (National Register Bulletin #15, pages 44-45).

Historic properties either retain integrity (that is, convey their significance) or they do not. Within the concept of integrity, the National Register Criteria recognize seven aspects or qualities that, in various combinations, define integrity.

To retain historic integrity, a property will always possess several and usually most of the aspects. The retention of specific aspects of integrity is paramount for a property to convey its significance. Determining which of

these aspects are most important to a particular property requires knowing why, where, and when the property is significant.

Districts and individual resources are considered to be significant if they possess a majority of the following Seven Aspects of Integrity: (National Register Bulletin #15, pp 44-45).

Location

Location is the place where the historic property was constructed or the place where the historic event occurred.

Design

Design is the combination of elements that create the form, plan, space, structure, and style of a property. It results from conscious decisions made during the original conception and planning of a property (or its significant alteration) and applies to activities as diverse as community planning, engineering, architecture, and landscape architecture. Design includes such elements as organization of space, proportion, scale, technology, ornamentation, and materials.

Setting

Setting is the physical environment of a historic property. Setting refers to the character of the place in which the property played its historical role. It involves how, not just where, the property is situated and its relationship to surrounding features and open space.

Materials

Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.

Workmanship

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.

Feeling

Feeling is a property's expression of the aesthetic or historic sense of a particular time period.

Association

Association is the direct link between an important historic event or person and a historic property.

The majority of the mill production buildings and administrative buildings have been severely modified, many of the buildings completely stripped of the original construction materials (Figures 291-293).

Location: The location of the mill is the same as the original mill site.

Design: The design of the mill has been modified over the years, which includes modifications to the landscape. However, changes to the integrity of the mill would vary depending on the actual period of significance.

Setting: The setting of the mill is still the same. The landscape, the railroad bridges, and the dammed river used to power the mill are intact.

Materials: The majority of the original windows have been removed and the window openings have been filled. Most of the mill equipment used to process and produce the paper has also been stripped.

Workmanship: The original 1899 workmanship of the mill is no longer present in the existing buildings.

Feeling: The mill does not express itself as a 1900 mill because all the changes.

Association: The association is no longer connected to the mill because it has been stripped down over the years (Figures 289-294). It also has no connection to the Village of Deferiet since the mill shut down and the houses in the village have been sold off. The connection between the two has been lost.

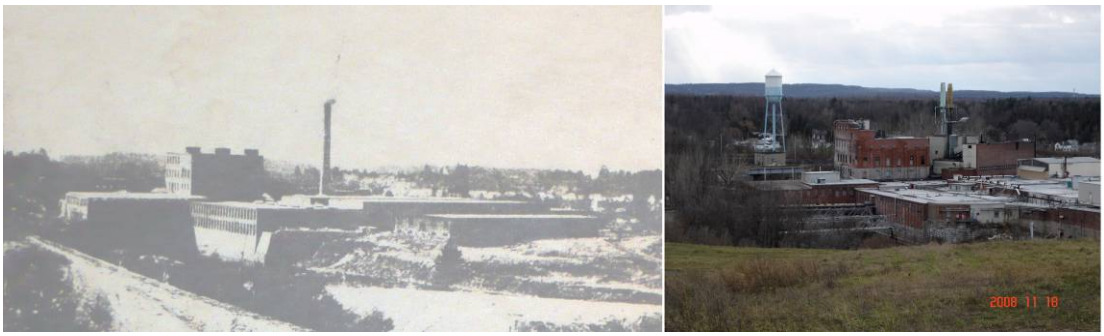


Figure 289. St. Regis Mill 1901 (left) compared to mill in 2008 (right).

Figure 290. Original construction of the sulfite mill (left) compared to the current condition of the sulfite mill (right).

Figure 291. Original mill office building on the left and a newer office building on the right.

Figure 292. Steel removed from east side of Wood Mill.

Figure 293. Exterior of modified opening in sulfite mill.

Figure 294. Exterior of modified opening in east elevation of Wood Mill.

The Village of Deferiet was also looked at as a potential smaller historic district. There is more than likely a historic district composed of the Village of Deferiet since it appears that every house is still intact. Some modifications to the houses included the addition of vinyl siding and the window modifications (Figure 295). The majority of the original village buildings are intact such as the store (Figure 296), the school (Figure 297), and churches. The only major buildings demolished are the old St. Regis Hotel (Figure 298) and the village apartment building. Overall, from a landscape aspect, the original layout and design of the village are intact.

Location: The location of the village is the same as the original village site.

Design: The design of the village has been modified over the years with the demolition and addition of a few buildings, including the demolition of the St. Regis Hotel and the removal of the tower on the school house.

Setting: The setting of the Village is still the same. The original design and layout of the streets are intact.

Materials: The original materials used on the buildings located in the villages have been modified. The original wood siding on the dwellings have been covered with vinyl siding and the original wood windows on the dwellings have been removed and replaced with newer windows.

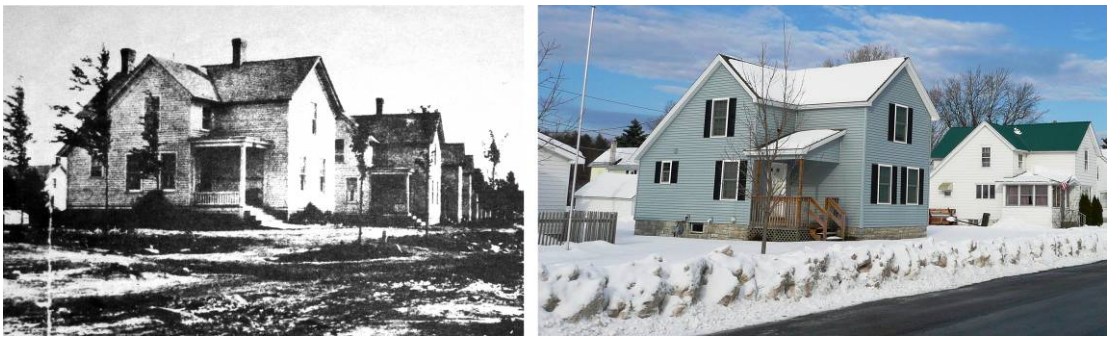


Figure 295. Example of an original house in the Village of Deferiet on the left compared to the current condition of the houses located in the village on the right.

Figure 296. Original construction of the general store on the left compared to the current condition of the general store on the right.

Workmanship: The village is not the work of a master.

Feeling: The village still expresses its sense as a mill village.

Association: The village is still functions as a village; however, the people that live in the village no longer work at the mill since the mill has been shut down. The connection between the two has been lost.

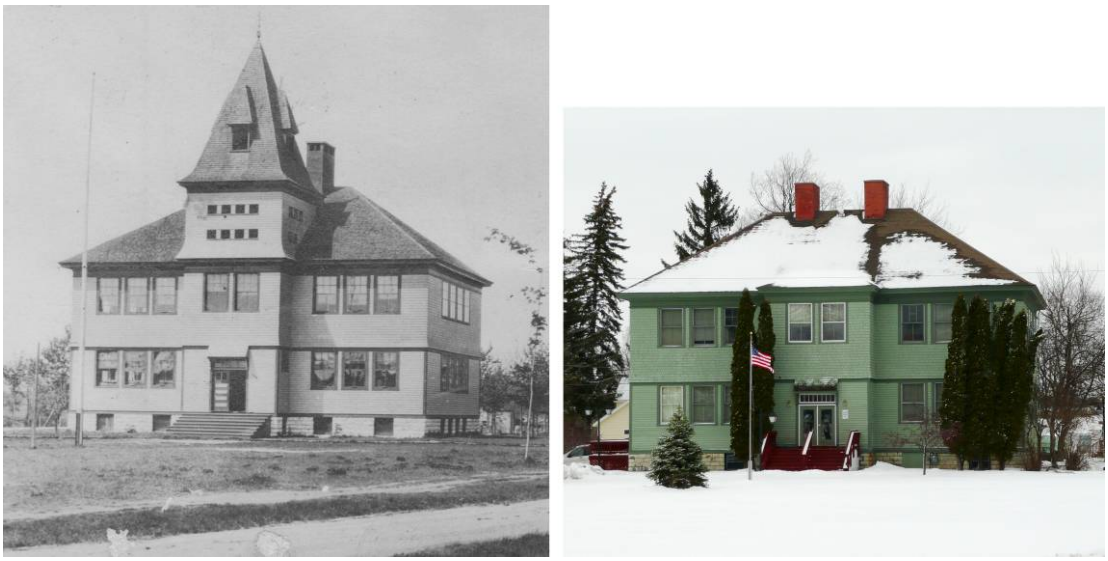


Figure 297. Original school house on the left compared to the current condition of the school house on the right.

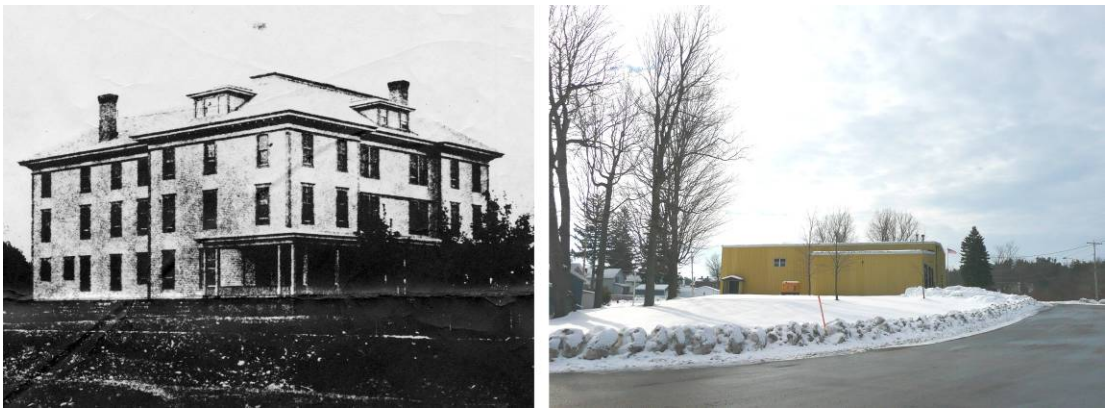


Figure 298. Original St. Regis Hotel on the left and the location of the hotel after demolition on the right.

Final Determinations of Eligibility

This study recommends that the mill itself does not have any integrity and thus will not be eligible for the National Register:

- Although the research team was composed of architectural historians (not structural engineers), there are severe concerns regarding the structural strength and stability of many of the buildings. It is highly recommend that Fort Drum hire a structural engineer to evaluate all buildings that may be used for training (see Figures 285-287 above for buildings that may have structural issues).
- It is recommended that Fort Drum have an archeological survey conducted of both the mill and village sites.

- This study does not find that the mill itself is eligible for the National Register of Historic Places, but the Village of Deferiet itself could potentially be a historic district. Fort Drum needs to take into consideration that, if it does purchase the paper mill and property, there could be adjacent gates or fenceline to a potentially eligible historic district.

6 Conclusions and Recommendations

This work surveyed the St. Regis paper mill (a 1900 Paper Mill) and the Village of Deferiet (a small village adjacent to the paper mill), both located near Fort Drum, NY, to determine if these properties are significant or not significant based on the application of standardized National Register Criteria within the property's historical context.

This work concludes that, while the St. Regis Paper Mill, more commonly known as the "Deferiet Paper Mill," is not eligible for the National Register of Historic Places, it is a nationally significant property under Criterion A: Event and Criterion C: Architecture and. It also concludes that the Village of Deferiet itself could potentially be a "historic district."

Recommendations

Although the research team was composed of architectural historians (not structural engineers), there are significant concerns regarding the structural strength and stability of many of the buildings. It is highly recommend that Fort Drum hire a structural engineer to evaluate all buildings that may be used for training.

It is recommended that Fort Drum have an archeological survey conducted of both the mill and village sites.

If Fort Drum does purchase the paper mill and adjacent property, it is recommended that the installation consider that there could be a need for adjacent gates or fenceline to a potentially eligible historic district.

Environmental Survey Recommendations

Also, if Fort Drum does purchase or lease the paper mill and adjacent property, prior to leasing or purchasing property, it is recommended that:

1. A lease agreement stipulate pre-existing environmental conditions.
2. Structures in the industrial area of the paper mill site be evaluated by a structural engineer to determine if the structures themselves present a danger to soldiers.
3. The Army carefully evaluate the specific areas of the property that will be used for training. All other areas should be deemed off-limits by default.

4. Any chemicals, fuels, POL, etc. brought to be used by the Army must be carefully inventoried going onto and from the property to reduce the chance for the Army being blamed for pre-existing contamination.
5. Unless the existing abandoned system is upgraded, the Army provide portable latrines for personnel on the site, and collect any other wastewater generated for disposal off-site.
6. The Army refrain from training activities that would cause lead paint particles to become airborne.
7. The coal pile and ash pond areas should be off limits to soldiers until the areas are proven to be nonhazardous, or have been remediated.
8. The Mill Office Building not be used until leaks and structural damage have been repaired, and a thorough cleanup of the mold has been completed.
9. The Fort Drum Safety Office develop a safety plan for operations at the site.
10. Wall openings where there is unsupported masonry overhead be repaired or made off limits.
11. The Army not allow heavy tactical vehicles to drive over the Village of Deferiet water pipeline, nor should it allow the use explosives in close proximity to the water pipeline.
12. All training missions be coordinated with both Brookfield Power and the Village of Deferiet.
13. The entire site be secured to Army standards.

Prior to purchasing property, it is recommended that:

14. A thorough environmental site assessment be conducted to determine the existence and extent of sub-surface contamination.
15. Any contamination that was found during the site assessment should be mitigated according to ASTM remediation standards.
16. It would be desirable to purchase only the areas for which there is a training use. There is no advantage for the Army to purchase property with an environmental liability, for which there is no training use.

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Acronyms and Abbreviations

Term	Spellout
ACM	asbestos containing material
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CERL	Construction Engineering Research Laboratory
CES	Certified Environmental Services, Inc.
CRA	Conestoga-Rovers & Associates
DOE	Determination of Eligibility
DPW	Directorate of Public Works
ERDC	Engineer Research and Development Center
MIPR	Military Interdepartmental Purchase Request
MOUT	Military Operations on Urban Terrain
NaOH	sodium hydroxide
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NRHP	National Register of Historic Places
NSN	National Supply Number
OMB	Office of Management and Budget
PCB	polychlorinated biphenyl
POL	Petroleum, Oil, and Lubricants
PPE	Personal Protective Equipment
SR	Special Report
URL	Universal Resource Locator
WWTP	Wastewater Treatment Plant
WWW	World Wide Web

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (From - To)
26-02-2010	Final	

4. TITLE AND SUBTITLE
St. Regis Paper Mill:
Architectural and Environmental Survey

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT

6. AUTHOR(S)
Adam Smith, Sunny Adams, Megan Weaver Tooker, Stephen Cosper, and Gary Gerdes

5d. PROJECT NUMBER
MIPR

5e. TASK NUMBER

5f. WORK UNIT NUMBER
21/2020/220/MIPR8LDATSS004

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Engineer Research and Development Center (ERDC)
Construction Engineering Research Laboratory (CERL)
PO Box 9005,
Champaign, IL 61826-9005

8. PERFORMING ORGANIZATION REPORT NUMBER
ERDC/CERL TR-10-4

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Commander, Fort Drum
10000 10th Mountain Division Drive
Fort Drum, NY 13602

10. SPONSOR/MONITOR'S ACRONYM(S)
Cultural Resource Manager

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT
This survey was initiated for a Section 110 process at Fort Drum, NY and was developed for the Fort Drum Directorate of Public Works (DPW) Environmental Division by evaluating the mill site for potential environmental and cultural issues. This architectural and environmental survey of buildings located at the St. Regis Paper Mill and the adjacent Village of Deferiet, NY contains a preliminary determination whether the St. Regis Paper Mill, the Village of Deferiet, or both locations, are eligible for the National Register of Historic Places (NRHP) as a historic district, and whether any buildings are individually eligible for the NRHP. This report also contains a survey and recommendations of environmental issues at the St. Regis Paper Mill. It is the determination of this report that the Village of Deferiet as a district is eligible for the NRHP. None of the mill buildings or buildings located within the Village were found to be individually eligible for the NRHP, nor was the St. Regis Paper Mill found to be a historic district eligible for the NRHP.

15. SUBJECT TERMS
Fort Drum, National Register of Historic Places (NRHP), cultural resources management, historic preservation, Deferiet, St. Regis Paper Mill

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (include area code)
Unclassified	Unclassified	Unclassified	SAR	206	