United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials and areas of significance, enter only categories and subcategories listed in the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Morton Memorial Laboratory of Chemistry

other names/site number

2. Location

street & number Sixth and River Streets ☐ not for publication

city or town City of Hoboken ☐ vicinity

state New Jersey code NJ County Hudson zip code 07030

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I certify that this [X] nomination

☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property

[X] meets ☐ does not meet the National Register criteria. I recommend that this property be considered significant

☐ nationally ☐ statewide ☐ locally. ☐ See continuation sheet for additional comments.

Signature of certifying official/Title Date

Deputy SHPO Assistant Commissioner for Natural & Historic Resources
State or Federal agency and bureau

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

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that this property is: Signature of the Keeper Date of Action

☐ entered in the National Register.
☐ See continuation sheet.

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

☐ determined not eligible for the National Register.

☐ removed from the National Register.

☐ other, (explain:)

5. Classification

Ownership of Property
(Check as many boxes as apply)

- [x] private
- [ ] public-local
- [ ] public-State
- [ ] public-Federal

Category of Property
(Check only one box)

- [x] building(s)
- [ ] district
- [ ] site
- [ ] structure
- [ ] object

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

Contributing	Noncontributing	
1		buildings
		sites
		structures
		objects
1		Total

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

N/A

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(Enter categories from instructions)

Education/Research Facility

Current Functions
(Enter categories from instructions)

Education/Research Facility

7. Description

Architectural Classification
(Enter categories from instructions)

Classical Revival

Materials
(Enter categories from instructions)

foundation Granite
walls Red brick
roof Built-up roofing
other Limestone trim, Granite steps

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

See attached.

8 Statement of Significance

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

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

Criteria considerations
(mark "x" in all the boxes that apply.)

Property is:

- [ ] **A** owned by a religious institution or used for religious purposes.
- [ ] **B** removed from its original location.
- [ ] **C** a birthplace or grave.
- [ ] **D** a cemetery.
- [ ] **E** a reconstructed building, object or structure.
- [ ] **F** a commemorative property.
- [ ] **G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

Architecture

Period of Significance
1906

Significant Dates
1906

Significant Person
(Complete if Criterion B is marked above)

N/A

Cultural Affiliation
N/A

Architect/Builder
Ackerman & Partridge (architect)
Whitney Company (builder)

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

9. Major Bibliographical References

Bibliography
(cite the books, articles, and other sources used in preparing this form on continuation sheets.)

Previous documentation on file (NPS):
- [ ] preliminary determination of individual listing (36 CFR 67) has been requested
- [ ] previously listed in the National Register
- [ ] previously determined eligible by the National Register
- [ ] designated a National Historic Landmark
- [ ] recorded by Historic American Buildings Survey # _____
- [ ] recorded by Historic American Engineering Record # _____

Primary location of additional data
- [ ] State Historic Preservation Office
- [ ] Other State agency
- [ ] Federal agency
- [ ] Local government
- [x] University
- [ ] Other

Name of repository:
Stevens Institute of Technology Archives

10. Geographical Data

Acreage of property 0.28 Acres

Latitude / Longitude Coordinates
(Note to Preparers: NJ HPO will complete this portion of the Registration Form for all Preparers, based on the coordinates derived from the Site Map or District Map that HPO produces.)

1. Lat 40.743318 Long -74.026881
2. Lat 40.743225 Long -74.026319
3. Lat 40.743021 Long -74.026419
4. Lat 40.743112 Long -74.026932

Datum: NAD 1983 State Plane New Jersey

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet for Section 10.)

Boundary Justification Statement
(Explain, on the section sheet following the Verbal Boundary Description, how the chosen boundaries meet the requirements for boundary selection and are the most appropriate boundaries for the nominated property or district.)

11. Form Prepared By

name/title Meredith Arms Bzdak, PhD / Partner

organization Mills + Schnoering Architects, LLC date March 2020

street & number 200 Forrestal Road, Suite 3A telephone 609.681.2480

city or town Princeton state NJ zip code 08540

Additional Documentation

(Submit the additional items with the completed form that are outlined in the "Standard Order of Presentation" that NJ HPO provides. Each page must contain the name of the nominated property or district, and the State and the county in which the property or district is located. Consult with NJ HPO if you have questions.)

Property Owner

(Either provide the name and address of the property owner here or provide the information separately to NJ HPO. Check with NJ HPO for other requirements. All owners' names and addresses must be provided, including public and non-profit owners, but their presence on the form, itself, is not required).

name Stevens Institute of Technology

street & number 1 Castle Point Terrace telephone

city or town Hoboken state NJ zip code 07030

Summary Paragraph

The Morton Memorial Laboratory of Chemistry was the third new building to be constructed on the campus of Stevens Institute of Technology (Hoboken, NJ). It was designed by architects Ackerman & Partridge and constructed in 1905-1906 by A.R. Whitney, Jr. and Company. Constructed of brick with limestone trim and designed to be fireproof, its carefully composed Classical Revival exterior is distinguished by tall brick chimneys that extend beyond the roofline. The chimneys, which exist on both of the long elevations, were designed to provide ventilation for laboratory hoods. They are composition-organizing features of the design and facilitated a state-of-the-art lab environment in the first decade of the twentieth century. Now vestigial, they remain key features of the overall composition. The facades retain a high degree of architectural integrity. The main entrance is at River Street, facing west, and gives access to the original staircase that survives in the first-floor lobby. The interior is defined by double-loaded corridors with labs, classrooms, and offices on the north and south sides. Morton became part of a larger science complex in 1946-48 with the addition of two Colonial Revival structures known as Peirce and Kidde Halls; however, Morton retains its distinctive appearance and primacy within the complex. The building has been carefully maintained over the last hundred years while being fully utilized for its original purpose, and, although interior spaces have been reprogrammed and modernized, overall Morton retains a high degree of architectural integrity.

Setting

Today, following considerable expansion of the University into the former Stevens property, Morton is located within what is now the southern, more urban end of the campus, on the northeast corner of River and Sixth Streets (Photo 1). It is oriented parallel to Sixth Street; the principal entrance to the building is at River Street, with a secondary entrance at the Stevens Gate House facing the Hudson River. Since 1948, it has formed the southern arm of a trio of buildings (a science complex) that includes the Peirce and Kidde Buildings, and the three together create an outdoor courtyard space that opens toward the Hudson River to the east.

Morton is set within a disparate mix of campus buildings that reflect several periods of construction as well as at least three historic contexts: the urban development of the City of Hoboken, the private development of the Stevens estate, and the 19th, 20th, and 21st century development of the University. To the west of Morton, across River Street, is a small collection of late 19th century/early 20th century residential rowhouses that pre-date Morton and are now owned by the University and utilized as student housing, as well as the new Gateway Academic Center (completed in 2019). The mid-twentieth century, modernist Burchard Building is located diagonally across River Street from Morton, and to the south is the more contemporary, six-story Babbio Center for Technology Management. The nineteenth-century Stevens Gate House and Wittpenn Walk (which also pre-date the development of the campus) flank Morton at its eastern elevation.

The lot that contains Morton is quite small and incorporates parking at the southern edge. There is limited landscaping, with the exception of several small shrubs along the foundation at the building's main entrance

and a narrow planting bed to either side. The physical context for Morton has become more dense over time although its relationship to the street grid and natural landscape have remained consistent.[1]

Historic Description

Upon its completion, Morton was referred to as "substantial and ornate in architectural design,"[2] a description that also seems fitting today. It was further reported in 1906:

> The laboratory is very conveniently situated with respect to the other Institute buildings. It is located on the north-east corner of River and Sixth Streets, and has a frontage of about 52 feet on River Street and 118 feet on Sixth Street. The plot of ground upon which the building stands is a part of the new tract of land secured by the Institute on the Castle Point grounds. Before commencing building operations it was necessary to cut this formerly rather high ground down to about six feet above the River Street level…The building is without a basement and consists of three stories….The exterior walls are built of red, hard-burned bricks with raked joints, upon a granite base; the trimmings are of limestone, and the steps leading to the building are of granite….The windows are large and well distributed so as to afford an abundance of light.[3]

As detailed in the *Indicator* of July 1906, in an article authored by Professor F. J. Pond, the entrance to the building from River Street featured a 31-foot wide lobby, off of which an 8-foot wide corridor extended the length of the building. Within the lobby was an iron staircase with slate steps leading to a second floor lobby, and continuing up, to a third floor corridor.[4]

The first floor of the building was defined by a double-loaded corridor with rooms (offices, private laboratories, and support spaces) to either side of a central corridor that extended the length of the building.[5] The floor to ceiling height on this floor was 12 ½ feet, and walls were lined with buff brick above a base of red brick. Floors on the first floor were maple (in offices and balance rooms) or cement. Doors to the rooms featured transoms.

The second floor, conversely, had one principal space, a large laboratory for qualitative and quantitative analysis. The laboratory space was supported by smaller ancillary support spaces that included the Combustion Room (used in the ignition of precipitates); the Hydrogen Sulphide Room (for any use of hydrogen sulphide gas); the Laboratory Supply Room; and the Balance Room (located on a mezzanine floor above the laboratory supply and hydrogen sulphide rooms). The main Laboratory itself occupied nearly the entire second floor, measuring 91 feet long by 48 feet wide, with a floor-to-ceiling height of 17 ½ feet. The room was well

[1] This bird's eye view shows Morton shortly after completion, although the artist has omitted buildings not related to Stevens Institute other than the Stevens Castle, so it is not completely accurate.
[2] "Stevens Institute of Technology, 1871-1921," unpaginated.
[3] Pond, 13, 17.
[4] Pond, 14. Pond's description of the interior of the building includes the exhaust system and is very detailed and technical.
[5] Pond, 25.

lighted by tall windows on both the north and south walls and organized with sixteen working tables, with aisles in front of the windows and at the center of the room. Each working space included a down-draft ventilation hood.

The third-floor corridor opened directly off the main stairhall, and was located slightly off-center, with various rooms to either side. Spaces included a Recitation Room, a Memorial Room, and a Preparation Room, with a small office (for use by the Professor of English) and support space. The focal point of the third floor was the Lecture Room, which served all lectures in general and engineering chemistry.[6] The Lecture Room was brightly lighted, principally through the skylighted sawtooth roof above, and organized with a stepped floor and fixed writing tablets. The Lecture Room could accommodate an audience of 198.

An historic description included in the *Annual Catologue* of 1906-1907 provides several additional details:

> A hall runs through on the main floor from entrance to entrance. On each side of this are situated the private laboratories of Dr. Stillman and Dr Pond, rooms for electro-chemistry, assaying and gas analysis, a stock room, a dark room, and the usual toilet and coat rooms.
>
> The main student laboratory is on the second floor, and contains ninety desks with four lockers to each desk. Individual hoods are placed at each desk to carry off all fumes. On this floor is also a combustion room, a stock delivery room, and a room for treating solutions with hydrogen sulphide. On a mezzanine floor above the stock and hydrogen sulphide rooms is a weighing room which accommodates forty students. This room is reached by flights of stairs directly from the main laboratory, from which it is screened by glass.
>
> At the east end of the top floor is a lecture room which accommodates one hundred and ninety-eight students. A room for the preparation of lectures is immediately adjoining this. At the opposite end of the floor is a recitation room seating ninety-eight students. Between these rooms is a Memorial Room. Here are kept the libraries of Dr. Morton and Dr. Leeds, together with other things pertaining to their memory. The roof over the lecture room is of a saw-tooth construction with windows facing the north, thus giving diffused light to the room.[7]

Current Appearance

Morton Hall is a three-story, rectangular plan building with its principal entrance facing west toward River Street (Photos 1 and 2). Of brick and steel construction with limestone trim and a granite panel-clad base, it is six bays long by three bays wide. Brick is laid in a running bond with raked joints, and limestone belt courses ornament the body of the building at the bottom of the first and second stories.

[6] Pond, 39.
[7] Annual Catalogue of the Stevens Institute of Technology, 1906-1907, 82, 84.

Morton Hall's most character-defining feature is its roofline (Photo 1). The flat roof is defined by raised brick parapets on the east and west elevations, a limestone and copper denticulated cornice, and, on the long north and south elevations, five brick chimneys that extend above the roofline and terminate in limestone-trimmed caps. Raised limestone parapets separate the chimneys.

Entrances to Morton Hall are at the east and west elevations (Photos 2, 3, 4, and 8), with the west elevation at River Street having primacy. The central west entrance has a shallow, curved, granite forecourt with three broad granite steps that lead to a four-step stoop with low granite side walls that transition seamlessly into the building's granite-clad base. First floor windows are capped by segmental brick arches with decorative limestone keystones.

The central entrance door at the west (main) elevation is framed by a limestone surround with keystone and flanked to either side by a single-light window with an arched brick lintel and decorative limestone keystone (Photos 2, 3, and 4). The original paneled wood doors have been replaced, and the transom above has been filled with glass block. A double-height, arched window surmounts the central entrance, and is divided with copper detailing. This window has a heavy limestone lintel and distinctive keystone. To either side of the central arched window, in the first and third bays, is a narrow double-hung wood window topped by a hopper window and limestone keystone and framed by brick pilasters to either side with limestone capitals and entablature. A denticulated limestone cornice defines the roofline, and above that, a central brick parapet with limestone panel reads "Stevens Institute of Technology / Morton Memorial / Laboratory of Chemistry."

The east elevation, of massive bearing wall construction, essentially mirrors the west (Photo 8). The central window at the east end has a straight lintel rather than an arched opening, and the windows in the side bays at the second story are paired. The central entry door is simplified and is not enhanced with a forecourt as at the west end.

The north and south (side) elevations are each six bays, articulated by pilasters that extend through the cornice and terminate in brick chimneys above the roofline (Photos 1, 5, 6, 7, and 8). Between the pilasters are two double-hung, keystoned windows with segmental brick arches at the first story, with a curtain wall system at the second and third stories consisting of triple windows divided by copper mullions and featuring decorative copper panels with round, wreath-like elements, and transom windows at the top story. The first story is set apart from the basement below and the second and third stories above by limestone belt courses, and the roofline is defined by a projecting, denticulated limestone cornice, broken at each of the chimneys. Above the cornice in each of the four center bays is a projecting parapet ornamented with a simple limestone tablet. The end bays, which enclose the building's stair towers, are simply designed, with a single keystoned window at the first and second stories.

The main, River Street entrance leads into a lobby that is dominated by the original iron staircase that extends vertically through the building at its southwest corner (Photo 9). The organization of the first floor is similar to its historic organization; it is defined by a double-loaded corridor (shifted slightly to the north) with a series of

classrooms and offices to either side, extending the length of the building. The building's secondary stair remains at the southeast corner of the building, and a new stairhall lobby has been created, likely to meet modern fire code requirements.

The second and third floors have been reorganized and modified as uses (and building code requirements) have changed over the years. The second floor plan now features a double-loaded corridor, similar to the first floor, with classrooms and offices to either side of the corridor (Photos 10 and 11). With the addition of Peirce and Kidde Halls to the north of Morton in the mid-1940s, a connection was made between the buildings via a second-floor walkway that opens off the north elevation of Morton at its western end but still allows Morton to retain its physical independence.

The large spaces on the third floor have given way to smaller instructional spaces and offices at the north and south with a bay of five office suites located within the center of the floor plan (Photo 12). Ceilings have been lowered and materials modernized throughout the building (vinyl flooring, new drywall partitions).

Morton Hall's essential character and image has been carefully maintained over the last hundred years as its program has evolved and interior spaces have been modernized to meet code. Its most significant character-defining features, all related to the building envelope, have been preserved with only minimal change over time.

Summary Paragraph

The Morton Memorial Laboratory of Chemistry is a Classical Revival style building designed by architects Ackerman & Partridge and constructed in 1905-1906. It was the third new building constructed on the Stevens Institute of Technology campus (Hoboken, NJ), and its completion marked the University's expansion beyond its original city block. It was also representative of the considerable growth and development of the chemical engineering discipline during the 1890s and 1900s. The building's design, which featured ten prominent brick chimneys rising high above its roofline, evolved directly from its function, as President Morton, for whom the building is named, felt that ventilation was the ultimate key to a safe, state-of-the-art chemistry laboratory. Morton Memorial Laboratory is in excellent physical condition and retains a high degree of architectural integrity, albeit with programmatic and material changes on the interior. It meets Criterion C as an excellent example of an early 20th century collegiate chemistry laboratory.

Planning

The Stevens Institute of Technology campus began on the edge of the Stevens family estate on Castle Point in Hoboken, New Jersey, and its history and growth in the early years of its existence were inextricably linked with the Stevens family, one of Hoboken's first significant landowners and the founders of the University that today still bears their name. The first Stevens residence, the Stevens Villa, was constructed in 1784 but utilized principally as a summer retreat. A gatehouse was constructed of local green serpentine in 1845 at what is now Sixth Street, to serve as a formal entrance to the estate.[1] Between 1853 and 1859 the first Stevens residence was removed and replaced by a new dwelling, which became known as "the Castle," designed by prominent architect Alexander Jackson Davis in the Italian Villa style.[2]

In 1867, Edwin Augustus Stevens provided a parcel of land adjacent to his family's estate, $150,000 for construction of a building (to be erected within two years of his death), and $500,000 for an endowment for a new "institution of learning" (to be created within three years of his death). Stevens died in 1868, and an act incorporating the Stevens Institute of Technology was approved on February 15, 1870.[3]

The school's first building, constructed in that year and now known as Edwin A. Stevens Hall, was designed in the High Victorian Gothic style by well-known New York architect RM Upjohn. The growth and development of the campus over the first thirty years of its existence was slow and, to a certain extent, carried out with minimal strategic planning. Edwin A. Stevens Hall housed all campus functions until the construction of a second building, the Carnegie Mechanical Laboratory, to the north of and behind Edwin A. Stevens Hall on Hudson Street in 1902.[4]

[1] R. Gabrielan, *Hoboken; History & Architecture at a Glance* (Atglen PA: Schiffer Publishing Ltd., 2010) 14.
[2] Gabrielan, 12.
[3] F. D. Furman, *A History of the Stevens Institute of Technology* (Hoboken, NJ: Stevens Institute of Technology, 1905) 2-3, 6.
[4] Both Edwin A. Stevens Hall and the Carnegie Mechanical Laboratory remain extant and are fully utilized by the University.

The need for a new chemical laboratory building began to be voiced in the late 1880s and early 1890s during several meetings of the Alumni Association.[5] At the February 15, 1892 meeting of Alumni, the main topic for discussion was in fact a new building, and the Alumni committed to raising the necessary funds. Shortly thereafter, in March 1892, the Executive Committee of the Alumni Association distributed a circular to the Alumni asking for subscriptions and listing pledges already received, which totalled $12,605. By 1901, about $60,000 had been contributed, a substantial amount of that by President Morton.[6] A large increase in enrollment from 1902-1906, from 291 to 449, further helped to propel the project forward.[7]

Initially, it was thought that the new building should be constructed on the northwest corner of the original campus block, adjacent to the Carnegie Laboratory, and early architectural renderings show it in this location. Ultimately, however, the laboratory was relocated to allow for an anticipated future expansion of Carnegie. As President Humphreys, the second President of the Institute, was fund-raising to purchase a piece of the adjacent Stevens estate, it made sense to move the chemistry laboratory to a newly acquired plot of land on Sixth Street.

The new location occupied the most southern portion of the Castle Point grounds, next to the Sixth Street gate that served the Stevens Castle. The site was part of a six-acre tract of land that the school reported as "believed to be the best site in the immediate vicinity of New York City for an Engineering College."[8] To the north of the building would be athletic fields, and at a slight distance to the northeast, the Stevens Mansion. The site was adjacent to River and Sixth Streets, and as part of the construction of the new building, the high bank at this location was cut down and the land to the north of the building was given a more gentle slope. This allowed the ground floor of the new Laboratory of Chemistry to be about six feet above the street level.[9] With this relocation, the new chemistry building became the first brick and mortar expansion of the Institute beyond its original city block.[10]

Design and Construction

The New York City firm of Ackerman & Ross was hired to prepare plans for the new building.[11] Ackerman was an alumnus of Stevens, graduating with the class of 1891. The architects worked closely on the design with principal donor and first University President, Henry Morton, until his death in 1902. Morton was focused on

[5] "Dedication of Morton Memorial Laboratory of Chemistry," typescript, 13 June 1906, President's Collection, Box 8, Folder 2, 3-4.
[6] Stevens Institute of Technology, 1871-1921, Fifty Years of Progress and Service, unpaginated.
[7] Stevens Institute of Technology, 1871-1921, Fifty Years of Progress and Service, unpaginated.
[8] Annual Catalogue of the Stevens Institute of Technology, 1906-1907, 19.
[9] Annual Catalogue of the Stevens Institute of Technology, 1906-1907, 82.
[10] The chemistry department had been housed in the west wing of the main building. Stevens Institute of Technology, 1871-1921, Fifty Years of Progress and Service, unpaginated.
[11] The date of their hiring remains unclear; it is not recorded in any written histories of the building. It is clear they had been working with Henry Morton for at least a year, so it is like they were hired circa 1901.

the building's utility: "the architects should not be allowed to lay a single brick simply for architectural effect."[12] The architects and President Morton were supported by a committee of the faculty chaired by Prof. D.S. Jacobus.[13] A University publication from 1921 notes that the committee, in planning the new building, visited chemical laboratories in the US and in Europe, to better understand the range of work being completed.[14] Morton felt that the building's appearance should reflect and be driven by its use, and it was Morton who conceived of the chimneys, which would by their nature suggest a chemical laboratory and the removal of fumes from the chemical experiments being undertaken within. Morton repeatedly stated that "if we could make a success of the ventilation the building would be a novelty, and would be pointed out as a model of its kind."[15]

Initially, discussions of a new building focused solely on its use as a chemistry facility, but over time the discussion also included physics and languages.[16] Ultimately the building was designed specifically for chemistry, although the top floor offered a classroom and office for the Department of Languages, as well as a space called the Memorial Room, to be used for faculty meetings.[17]

The Ackerman & Ross plans were provided to several builders after Morton's death in 1902, but when bids were returned that exceeded the amount of money available to construct the building, President Humphreys made an appeal to the alumni and increased the fund substantially, to approximately $110,000. At this time the decision was made to change the name of the building to the Morton Memorial Laboratory of Chemistry (rather than the Alumni Building), in honor of President Morton. The Ackerman & Ross (now Ackerman & Partridge) plans were adjusted, with some rooms rearranged. Plans were redrawn a third time by Ackerman & Partridge after 1903 with the relocation of the building to the new, slightly larger site on Sixth and River Streets. Although the design essentially remained the same, an extra bay was added, and the basement was eliminated.[18]

The firm of A.R. Whitney Jr. and Company, led by A.R. Whitney, Jr. ME (Class of 1890) served as contractor. Many of those who participated in the design and construction were graduates of Stevens, and many donated their services.[19] Construction on the new building began in March 1905 and was completed in February

[12] D.S. Jacobus, "Evolution of the Morton Memorial Laboratory of Chemistry," *Stevens Institute Indicator*, vol. XXIII, no. 3, July 1906, 241.
[13] The committee included Drs. Thomas B. Stillman and F.J. Pond of the Department of Chemistry, and their contributions are detailed in Jacobus, 9.
[14] Stevens Institute of Technology, 1871-1921, Fifty Years of Progress and Service, unpaginated. Locations of the laboratories visited were not recorded. Dr. Jacobus' discussion of the evolution of the building notes that the system ultimately adopted for ventilating the laboratory grew out of the desire to create an environment that exceeded any visited in terms of ventilation. The result involved placement of a hood at each student's desk and ensuring that all of the hoods remained open at all times. (Jacobus, 11.)
[15] Jacobus, 242.
[16] "Dedication of Morton…." 8.
[17] "Dedication of Morton…." 9.
[18] Jacobus, 9.
[19] These included Wm. C. Post, ME, '86 (VP of Post & McCord, Structural Steel); A.R. Wolff, ME, '76 (designer of heating and ventilating plant); B.P. Hall, ME '88 (Treasurer of NY Steam Fitting Co, contractors for heating and ventilating plant); R.E. Hall, ME, '95

1906.[20] Its official dedication occurred on June 13. Upon its opening, Morton housed all of the Chemistry department and also the English department. A large room on the third floor, called the Memorial Room, was to be used for faculty meetings.

Dedication

The Morton Memorial Laboratory of Chemistry was named for the University's first President, Henry Morton, and dedicated June 13, 1906 to Morton's memory. The building was originally to be known as the Alumni Chemical Building, but given President Morton's considerable contributions, the name Alumni-Morton Building was also considered. Dr. Morton did not want his name used, but after his death the alumni felt it was appropriate to honor him in this way.[21] Design and construction of the building had cost almost exactly $150,000, including equipment; Dr. Morton had contributed approximately $40,000.

The dedication exercises were held in the Stevens Building auditorium and opened with a prayer by the Rev. J. Clayton Mitchell followed by an address by the second President of the University, President Alexander C. Humphreys. President Humphreys reviewed the history of the building's construction and the commitment of President Morton to the project, and introduced Alten S. Miller, ME (Class of '88). Miller focused his presentation on Morton's personal biography and dedication to Stevens. William A. Jenner, Esq., an associate of Morton, also spoke, followed by the singing of the Alma Mater by the glee club, and finally, a closing address by Dr. Charles F. Chandler, a professor of Chemistry from Columbia University and close friend of Henry Morton. The formal exercises ended with the placement of a memorial tablet by the President of the Alumni Association, Prof. William H. Bristol, inside the Laboratory.[22]

The Donor, President Henry Morton

Henry Morton PhD, ScD, LLD (11 December 1836 – 9 May 1902) was born in New York City but raised in Philadelphia; his father, Rev. Henry J. Morton, DD, served as rector of St. James Episcopal Church in Philadelphia for 56 years. Morton attended the Episcopal Academy of Philadelphia and the University of Pennsylvania and graduated with the class of 1857.[23] He began teaching chemistry at the Philadelphia Dental College in 1863, and in 1864 was appointed resident secretary of the Franklin Institute in Philadelphia and began offering a series of public lectures on light, sound, and other related topics with the goal of promoting

(Secretary of NY Steam Fitting Co); Richard Beyer, ME, '88 (McCann & Beyer, surveyors); H.V. Meeks, ME, '01 (Meeks, Hermance Co, electrical contractors). "Dedication of Morton…," 18-19.

[20] A portion of the building was utilized as early as December 18, 1905, and regular classes were begun February 27, 1906. (Dedication of Morton…," 17).

[21] "The Morton Chemistry is Right," *The Stevens Indicator*, vol. 101, no. 1, Spring 1984.

[22] The dedication "box" contained three *Stevens Indicator* publications: July 1902 (with a biography of Morton), April 1903 (celebrating the inauguration of President Humphreys), and the current (June 1906) issue. ("The Morton Chemistry is Right….")

[23] Furman, 1905. Furman's text includes a very detailed and thorough biography of Morton authored by his successor President Alexander C. Humphreys. Humphreys reviews Morton's wide range of interests and accomplishments, ranging from the Rosetta Stone to poetry to biblical science.

public interest in science and in the collections of the Institute. His lectures proved to be very popular, and "served to make Professor Morton's name well known at home and abroad."[24] He became editor of the "Journal of the Franklin Institute" in 1867, and in 1868 began teaching chemistry at the University of Pennsylvania.[25] Morton received his first degree of Doctor of Philosophy from Dickinson College in 1869 and a second one from Princeton University in 1870, and that same year became the first President of Stevens Institute of Technology.

During his tenure with Stevens, Morton made a significant income serving as an expert witness in legal cases focused on chemistry and physics. He also authored scholarly articles on fluorescent lighting, served as vice president of the American Chemical Society and was a member of the National Academy of Sciences.[26] President Morton believed that the school should have a broad course of study that would allow its graduates to pursue careers in any engineering discipline; as a result, Stevens graduates went on to specialize in range of fields that included gas works engineer, electrical engineering, hydraulic engineering, heating and ventilating, chemistry, telephony and telegraphing, wireless, marine engineering, railroad engineering, automobile engineering, aviation, and others.[27]

In 1871, with Samuel Bayard Dod, Morton helped to establish the Stevens School, which operated as a private preparatory school and was located on the Stevens campus, first within a wing of the main building and beginning in 1888, in a new building of its own (no longer extant) to the rear of the Stevens building. The Stevens School provided a significant source of revenue to the Institute for a number of years.[28]

Morton had a long philanthropic relationship with Stevens, from providing funding for machinery and apparatus, to the creation of the Chair of Engineering Practice and endowment of that Chair, to the donation of railroad stock toward construction and maintenance of campus buildings. In 1901, Morton set up an endowment fund of $50,000 that became known as "The Henry Morton Endowment Fund," designed to support maintenance of the Alumni Building and also to be used as a pension fund that compensated instructors injured on the job.[29]

In addition to his own substantial philanthropy efforts dedicated to the support and enhancement of the University, Morton was also responsible for securing millionaire Andrew Carnegie as a member of its Board of Trustees, beginning in 1891. Carnegie became the Institute's most substantial donor over the next twenty-five years. Morton is also credited with approaching Carnegie regarding a large donation toward the construction of a new campus building that would be named the "Carnegie Mechanical Laboratory." As a result of their

[24] Furman, 172.
[25] Furman, 173.
[26] G. W. Clark, *History of Stevens Institute of Technology*, 122.
[27] Stevens Institute of Technology, 1871-1921, Fifty Years of Progress and Service, unpaginated.
[28] Clark, 122-123.
[29] Annual Catalogue of the Stevens Institute of Technology, 1906-1907, 17-18.

discussions, Carnegie provided over $100,000 toward the completion and endowment of the building, and after Morton's death, gave Stevens another $150,000 for the endowment of the Carnegie Laboratory.[30]

Morton served as President of Stevens Institute of Technology until his death in 1902, following a long illness. The completion of the building that became known as the Morton Memorial Laboratory of Chemistry occupied him thoroughly during the last years of his life.

The Architects, Ackerman & Partridge

Initial plans for the Morton Memorial Laboratory of Chemistry were drawn by the firm of Ackerman & Ross of New York. When the construction bids came in over budget, the plans were revised, and new plans were prepared by the firm, which by then had become Ackerman & Partridge. Although the design of the building did not undergo significant change, it is the latter firm, Ackerman & Partridge, that is generally credited with the authorship of Morton.

William Sickles Ackerman was an architect and engineer, born November 2, 1868 in Paterson NJ. Ackerman was educated at Stevens and graduated in 1891. Following his graduation, he was engaged over the next several years with the design of power plants, office buildings for mining companies, and work as consulting engineer with the National Lead Co.[31] Ackerman formed a design partnership with Albert Randolph Ross in New York from 1897-1902; the partnership dissolved upon Ross's retirement. The Ackerman & Ross partnership produced several Carnegie Libraries (Washington, DC; Atlanta, GA; San Diego, CA) as well as Stevens' Beaux-Arts style Carnegie Laboratory of Engineering (1901; Photo S1).

Ackerman formed a new partnership with W.T. Partridge in 1903,[32] with an office located at 156 Fifth Avenue, NYC. The Ackerman & Partridge firm was short-lived, dissolving in 1905, and Ackerman subsequently consulted on mill construction and power plants. He died Nov 11, 1918 of heart failure after a brief illness. At the time of his death he worked for the ordnance department as supervising engineer of the Government Carbocoal plant in Russell, VA.[33]

One of Mr. Ackerman's obituaries singled out his work at Morton, noting that it was "most notable …from a scientific standpoint…Mr. Ackerman made a special study of the requirements of a chemical laboratory and put forward a design containing so many new and admirable features that it has served as a model for many of the more recent laboratories."[34]

[30] Clark, 124-127.
[31] "William Sickles Ackerman Obituary," *Stevens Indicator*, vol. XXXVI, 1919, 37-39.
[32] *The American Architect and Building News*, vol. LXXX, no 1428, May 9, 1903.
[33] "William Sickles Ackerman," *Mechanical Engineering*, vol 41, 1919, 81.
[34] "William Sickles Ackerman," 81.

Early 20th century chemistry laboratories

The last two decades of the nineteenth century and the first decade of the twentieth century were a very important time in the history of chemistry and chemical engineering. The disciplines of chemistry and chemical engineering are closely related but also have some distinct differences:

> Chemists have a detailed knowledge of chemical structures, reactions, properties and of the underlying principles and theories….They work in a laboratory with small amounts of material using instruments such as infrared, visible-ultraviolet, mass and nuclear magnetic resonance spectrophotometers, chromatographs and others. Chemical engineers have a general knowledge of chemistry, but their main focus is detailed knowledge of heat and mass flow, thermodynamics and the mathematics necessary for calculations in these areas. They scale up methods of synthesis, design systems for heating, cooling and transporting large amounts of material, work on improving the efficiency and economics of industrial processes.[35]

For the purposes of this study, it is useful to look at the Morton Memorial Laboratory of Chemistry within the context of similar buildings that supported either the basic study of chemistry or the more process-oriented chemical engineering, as the architectural distinctions are almost non-existent and the number of remaining contemporary examples of either are few and a high percentage of those that have survived had undergone considerable renovation or change.

In the United States, there was a general expansion in engineering education in the second half of the nineteenth century; the number of engineering schools increased from seven to eighty-five between 1862 and 1880. For the most part, graduates received degrees in civil, mining, or mechanical engineering, but by the 1880s and 1890s, electrical and chemical engineering degrees were becoming more common. At Stevens, the focus was on a broad curriculum that centered on fundamentals as opposed to specialized courses. The Stevens curriculum at the end of the nineteenth century included classes in civil, electrical, chemical, and materials engineering, as well as mechanical engineering and associated shop courses.[36]

Education in both chemistry and chemical engineering was mostly informal until the end of the nineteenth century. Chemistry was studied in German universities earlier in the century, however; the University of Giessen (near Frankfurt) established a chemistry laboratory as early as 1825.[37] The first course in chemical

[35] Rensselaer Polytechnic Institute School of Science, "Chemistry or Chemical Engineering – What is the Difference?, https://science.rpi.edu/programs/undergrad/bs-chemistry/Chemistry%20or%20Chemical%20Engineering%20%E2%80%93%20What%20Is%20the%20Difference%3F, accessed 16 March 2021.
[36] Clark, 109-117.
[37] N. Peppas, "The First Century of Chemical Engineering," *Distillations*, 2 June 2016 https://www.sciencehistory.org/distillations/the-first-century-of-chemical-engineering, accessed 2 March 2020.

engineering was offered in 1887 in Manchester, England in the form of a series of lectures by George E. Davis that were subsequently published in *Chemical Trade Journal.*

Education in chemical engineering in the United States was pioneered by the chemistry department of the Massachusetts Institute of Technology (MIT), when they offered a new course in chemical engineering in 1888.[38] Frank H. Thorpe, an MIT graduate who went on to also teach at MIT, authored what is considered to be the first textbook on the subject, entitled *Outlines of Industrial Chemistry* in 1898. In addition to MIT, universities considered to be pioneers in the development of a four-year chemical engineering curriculum included the University of Pennsylvania (1894), Tulane University (1894), the University of Michigan (1898), and Tufts University (1898). Chemical engineering became more firmly established as a discipline in 1908, with the founding of The American Institute of Chemical Engineers (AIChE).

Late 19th century chemistry and chemical engineering buildings tended to be large-scale, rectangular-plan structures that fit the established stylistic pattern of the college or university. Early 20th century chemistry buildings were similar, with limited or no specific architectural references to the building's function. Interior plans, to the extent that they are known, reflected the building's program and included spaces for laboratories, classrooms, and faculty offices. Ceilings were typically high, for ventilation; finishes were minimal and utilitarian. Some of the earliest buildings are no longer extant; many are no longer used for chemical engineering. In the majority, they have undergone expansion and renovation projects that have altered their original appearance and diminished their historic integrity markedly.

One of the earliest, the Winslow Chemical Laboratory of Rensselaer Polytechnic Institute (1865), survives today despite several fires and the loss of original fabric. Constructed of brick with stone trim, its three stories featured tall, regularly spaced windows; six chimneys ornamented the roofline (Photo S2). Its design and construction, like many early chemistry and chemical engineering buildings, was guided by Professor Henry B. Nason, the head of the chemistry department, although its architect is unknown.[39] The building's function has changed several times, resulting in successive changes to its interior layout, it has been enlarged considerably, and successive fires have diminished its integrity (including the loss of most of the chimneys), however, the building was listed on the National Register of Historic Places for its association with the early growth and development of the Institute.

Two other early purpose-built collegiate chemistry buildings – those for Lehigh University and the University of Wisconsin – served as important models for the design of Morton Memorial Laboratory.

[38] The course was offered by Lewis M. Norton. N.A. Peppas, "The First Century of Chemical Engineering," *Distillations* (Science History Institute), 2 June 2016. Arthur Amos Noyes also founded MIT's Research Laboratory in Physical Chemistry in 1903, and William H. Walker founded their Research Laboratory of Applied Chemistry in 1908. Both of these laboratories were established prior to MIT's move to Cambridge; more extensive research is required regarding the physical spaces in which these laboratories existed.

[39] Rensselaer Polytechnic Institute, Institute Archives and Special Collections, "Up the Hill Continued: Winslow Chemical Laboratory," https://archives.rpi.edu/blog/2012/11/08/up-the-hill-continued-winslow-chemical-laboratory, accessed 16 March 2021.

Lehigh University constructed the William H. Chandler Chemistry Laboratory (initially known as the Lehigh University Chemical Laboratory) during the mid-1880s (1884-85; Photo S3). The prominent Philadelphia architect Addison Hutton is credited with the design, although, as was true at Stevens, there was also considerable input from faculty: William Henry Chandler (1841-1906) – a professor, chairman, librarian, and acting president of Lehigh – is said to have contributed significantly to the planning and design of the original, Colonial Revival building, which is defined by tall, regularly spaced chimneys.

Chandler-Ullmann Hall (as it is now known) was expanded in 1921 and 1938, and no longer serves the chemistry department, which was relocated in the 1970s and the building renovated. It has recently undergone another comprehensive renovation (2018-2019) that further diminished its integrity. The main goal of the most recent renovation was to transform the building into an academic hub while preserving its historic features, and to support programming for the psychology and mathematics departments. The renovation demolished two large classrooms, as well as the sloped lecture hall on the first floor. A new steel structure was inserted to provide a continuous floor plan for the ground, first, and second floors.[40] Dominic Packer, associate dean for research and graduate programs in the College of Arts and Sciences, spoke at Chandler-Ullmann's open house and noted "while the building's exterior was—and remains—beautiful…the interior (was) haphazardly renovated over the years, resulting in floor layouts…..(that were) 'confusing.'"[41]

Chandler-Ullmann shares an obvious formal similarity with Morton, most notably the use of tall chimneys as organizing features on the buildings' exterior. Although it is not known specifically if the Stevens committee visited Lehigh during the planning of what would become Morton, it seems very likely, as Bethlehem is relatively close to Hoboken and Chandler would undoubtedly have been known by the chemistry faculty.

Like Lehigh's Chandler Hall, H. C. Koch's Chemical Engineering Building for the University of Wisconsin (Madison) of 1885 (Photo S4) was defined architecturally by its tall chimneys and bore at least some physical resemblance to Stevens' Morton Memorial Laboratory. The Koch building was the first on campus dedicated solely to chemistry, and within twenty years was unable to accommodate the growing department. As a result, a new building, Chamberlin Hall, was opened in 1905, with the original building continuing to support parts of the chemical engineering department as well as parts of the medical school. The original building is no longer extant (demolished in the 1970s); Chamberlin Hall is now home to the Physics Department.

The chemistry buildings constructed during the last decade of the 19th century were typically large-scale, rectangular-plan structures that were designed to fit well within a larger campus context, and they did not display any overt identifying features that would have alluded to their function. Cornell's Morse Hall was constructed in 1889 in a Beaux-Arts adaptation of the Romanesque Revival (Photo S5). The upper two stories and most of the basement of the building were destroyed by fire in 1916; the portions that remained were adapted for use as an Art Gallery and then demolished in 1954. Tulane's Richardson Building (1894, with

[40] M. E. Alu, "Historic Chandler-Ullmann Hall Reopens After Extensive Renovation," Lehigh News, 5 September 2019.
[41] Alu.

additions in 1908), was designed in a similar fashion: a long, rectangular, Romanesque Revival building of two stories with a central entrance marked by a large gable (Photo S6). Richardson is no longer a chemistry building, but instead houses the advising department for all Newcomb-Tulane undergraduates and classroom space for a variety of subjects, as well as the Center for Engaged Learning and Teaching on the top floor.[42] Tufts University's Robinson Hall, completed in 1899, was a utilitarian masonry building that held no overt clues to the work being undertaken within (Photo S7). A renovated Robinson Hall recently became part of a large new state-of-the-art Science and Engineering Complex (SEC) that tripled available space.

New chemistry buildings constructed in the first years of the twentieth century followed the pattern that was established in the last decade of the nineteenth. Typically large-scale, and readily expanded, they reflected a Beaux-Arts reliance on Classical form and details, and projected an image of importance without a clear message of function or use. The University of Wisconsin-Madison's Chemistry Building, built in 1905, reflects this trend (Photo S8). The building was renamed Chamberlin Hall in 1975, and was expanded substantially multiple times, in 1912, 1939, 1956, and 1973, and fully renovated and reconstructed in 2002. Chamberlin is now home to the University's physics department. The Towne Building at the University of Pennsylvania also typifies the eclecticism that defined the period (Photo S9). Cope and Stewardson looked to the English classicism of Christopher Wren for the new laboratory, opened in 1906, but give no clue to the building's purpose. It remains the home of the School of Engineering and Applied Science administrative offices and several of its departments.[43]

The Chemical Laboratory of the University of Michigan, like many of the early chemistry buildings, was designed by a committee of faculty and staff working with a team of architects, in this case the firm of Smith, Hinchman, and Grylls of Detroit (Photo S10). Opened in October 1909, the resulting design was, like so many others of the first decade of the 20th century, reflective of an eclectic Beaux-Arts approach and was ultimately relatively generic in appearance. The building was nearly doubled in size by a 1949 addition designed by Louis Kingscott and Associates.[44]

North Dakota State University's Chemistry Building was completed in 1910 (Photo S11). Now known as Ladd Hall, it was designed in a Collegiate Gothic style and featured a four-story tower at its entrance that originally housed meteorological apparatus. In 1964 a significant modern-era addition was appended to the building (referred to as Dunbar Hall), essentially doubling its size, and in 1966 all windows were replaced, further diminishing its integrity. A remodeling of the interior was undertaken by the University in the mid-1970s.[45]

[42] "Richardson Building," Tulane University Campus Map, accessed 9 June 2020 (https://admission.tulane.edu/map).
[43] "Towne Building," Penn Facilities and Real Estate Services, Accessed 9 June 2020 (https://www.facilities.upenn.edu/maps/locations/towne-building). Interestingly, the president of Stevens Institute of Technology delivered an address at its formal dedication on October 19, 1906.
[44] Chemistry Department History, The Early Years, University of Michigan, Accessed 9 June 2020 (https://lsa.umich.edu/chem/about/department-history/early-years.html).
[45] While the building has been significantly expanded and renovated over time, it is included as a contributing element within the North Dakota State University District.

Another example of a large-scale, Beaux-Arts inspired early twentieth century chemistry building is that at the University of Mississippi in Oxford, MS (Photo S12). Today known as Brevard Hall, it was completed in 1923 and designed by the firm of Link & Trueblood. The architects chose a Neoclassical design for the exterior, with central columned portico. The building no longer houses the chemistry department and like so many of these early chemistry buildings, its interior has been remodeled several times, according to the Mississippi Department of Archives and History.[46]

In New Jersey, Princeton University, despite having one of the oldest chemistry departments in the country (founded in 1795), did not begin work on the creation of a state-of-the-art chemistry laboratory until the mid-1910s, when Henry Clay Frick and Dean Andrew Fleming West of the Graduate School, together with President Hibben, began discussions. Architect Charles Z. Klauder was selected as the architect, and the building, designed in the Collegiate Gothic style that became so popular on the campus during the first half of the twentieth century, was completed in 1929 (Photo S13). An addition to the rear by O'Connor and Kilham in 1964 doubled the laboratory's size, and a 1975 renovation project substantially modernized the complex. A new building (also called the Frick Chemistry Building) was constructed for the Chemistry Department in 2010, and the Klauder Building was transformed in 2017 for use by a variety of academic and administrative departments by KPMB Architects and renamed The Julis Romo Rabinowitz Building and the Louis A. Simpson International Building (also known as 20 Washington Road).

The chart on the following page summarizes the comparative building examples that have been reviewed – providing a summary of location, date of construction, and state of preservation – and makes clear the substantial changes to buildings of this type over time.

In summary, the Morton Memorial Chemistry Laboratory is one of the few surviving examples of an early collegiate chemistry laboratory. Its design reflects the collaborative skills of the team of academic scientists and architects who understood the needs of the new and rapidly growing discipline, and who translated those specific needs into an architectural language where form was driven by function. The building had very limited formal precedents, and its direct functionality was not emulated by other designers charged with the construction of similar buildings. Morton Laboratory has been well cared for by Stevens Institute of Technology over the last hundred years, with almost no changes to the building's original, character-defining exterior. Modifications to the interior have been made to accommodate programmatic evolution, changing building codes, and general building maintenance. The building retains a high degree of integrity of design, workmanship, and materials, as well as integrity of location, setting, feeling, and association.

[46] Information provided via NJHPO query by Jennifer Baughn, Chief Architectural Historian, Mississippi Department of Archives and History, 4 February 2021. Despite changes to use and design, it is included within a National Historic Landmark District related to the admission of James Meredith in 1962.

LOCATION	BUILDING NAME	DATE/CONST.	EXTANT	STATE OF PRESERVATION
RPI	Winslow Chemical Laboratory	1865	yes	no longer part of RPI campus suffered many fires interior remodeled - converted from chem lab to shops for M/E Engineering 1907 doubled in size through addition in 1930/31
Lehigh University	Wm. H. Chandler Chem Lab	1884/5	yes	Expanded 1921, 1938 chemistry moved out in 1970s comprehensive renovation 2018-2019
University of Wisconsin / Madison	Chemical Engineering Building	1885	no	demolished 1970s
Cornell	Morse Hall	1889	no	demolished 1954
Tulane	Richardson Building	1894	yes	additions 1908 no longer a chemistry building interior renovations ongoing
Tufts	Robinson Hall	1899	yes	fully renovated and part of larger complex
University of Wisconsin-Madison	Chemistry Building/Chamberlin	1905	yes	expanded in 1912, 1939, 1956, and 1973 fully renovated and reconstructed 2002 no longer occupied by chemistry department
University of Pennsylvania	Towne Building	1906	yes	occupied by School of Engineering and Applied Sciences administrative and classroom space
University of Michigan	Chemical Laboratory	1909	yes	addition in 1949 doubled size
North Dakota State Univ	Chemistry Building (now Ladd Hall)	1910	yes	significant addition 1964 phased interior remodelings mid-1970s
University of Mississippi	Chemistry Building	1923	yes	no longer a chemistry building interior remodeled several times
Princeton	Frick Chemistry Building	1929	yes	addition in 1964 doubled size modernized in 1975 "transformation" completed 2017

BIBLIOGRAPHY

Annual Catalogue of the Stevens Institute of Technology, 1906-1907.

Clark, Geoffrey W., *History of Stevens Institute of Technology; A Record of Broad-Based Curricula and Technogenesis, 1870-2000,* Jersey City: Jensen/Daniels, 2000.

"Dedication of Morton Memorial Laboratory of Chemistry," typescript, 13 June 1906, President's Collection, Box 8, Folder 2.

Feldman, J. *The Buildings of the University of Wisconsin*, Jim Feldman, 1977.

Furman, F. D., *A History of the Stevens Institute of Technology*, Hoboken, NJ, 1905.

Gabrielan, Randall, *Hoboken; History & Architecture at a Glance*, Atglen PA: Schiffer Publishing Ltd., 2010.

Jacobus, D.S., "Evolution of the Morton Memorial Laboratory of Chemistry," *Stevens Institute Indicator*, vol. XXIII, no. 3, July 1906.

The Journal of the American Society of Mechanical Engineers (January 1919).

Klauder, C.Z. and H.C. Wise, "Engineering Buildings and Central Heating Plants," *College Architecture in America and Its Part in the Development of the Campus,* London: Charles Scribner's Sons New York, 1929.

Leitch, Alexander, *A Princeton Companion*, Princeton University Press, 1978.

"The Morton Chemistry is Right," *The Stevens Indicator*, vol. 101, no. 1, Spring 1984.

Nichols, Edward L., "Biographical Memoir of Henry Morton, 1836-1902," *National Academy of Sciences Biographical Memoirs*, vol VIII, Washington: The National Academy of Sciences, 1915.

Peppas, Nicholas A. "The First Century of Chemical Engineering," *Distillations* (Science History Institute), 2 June 2016.

Pond, Prof. F. J., "The Morton Memorial Laboratory of Chemistry of Stevens Institute of Technology," *Stevens Institute Indicator,* vol XXIII, no. 3, July 1906.

Servos, J. W., *Physical Chemistry from Ostwald to Pauling; the Making of a Science in America*, Princeton, NJ: Princeton University Press, 1996.

Stevens Institute of Technology 1871-1921, *Fifty Years of Progress and Service,* Hoboken, NJ: Stevens Institute of Technology, 1921.

"William Sickles Ackerman," *Mechanical Engineering*, vol 41, 1919, 81.

"William Sickles Ackerman Obituary," *Stevens Indicator*, vol. XXXVI, 1919, 37-39.

Boundary Description

The nominated property is approximately .196 acres and includes the Morton Memorial Laboratory of Chemistry at the northeast corner of River and Sixth Streets, as shown on the Boundary Map located on the Continuation Sheet, Section 10. The nominated property includes the entirety of the building and its plantings and/or site features on the west, south, and east sides of the building.

Boundary Justification

The nominated property includes the entire built resource (Morton Memorial Laboratory of Chemistry) and the plantings and site features that have been associated with the building throughout its history.

PHOTOGRAPHS

The following information applies to all photographs:

Location of Digital Files: New Jersey Historic Preservation Office

Photo locations are shown on Figures 3-5 in the Accompanying Documentation.

Photo	Subject/Location	Photographer	Date
Photo 1	View of west and south elevations from River Street, with the intersection of River Street and Sixth Street in the foreground	Meredith Arms Bzdak	12/13/19
Photo 2	Main (west) elevation	Meredith Arms Bzdak	12/13/19
Photo 3	Main (west) elevation, entrance detail, looking southeast	Meredith Arms Bzdak	12/13/19
Photo 4	Main (west) elevation, entrance detail showing curved granite forecourt and steps	Meredith Arms Bzdak	12/13/19
Photo 5	South elevation	Meredith Arms Bzdak	12/13/19
Photo 6	North elevation, looking southwest	Meredith Arms Bzdak	12/13/19
Photo 7	North elevation, looking southeast (Peirce Hall at the right)	Meredith Arms Bzdak	12/13/19
Photo 8	East and north elevations, looking southwest, showing courtyard formed by the addition of Peirce and Kidde Halls	Meredith Arms Bzdak	12/13/19
Photo 9	Original iron staircase at southwest corner	Meredith Arms Bzdak	12/13/19

Photo 10	Second floor corridor, looking east	Meredith Arms Bzdak	12/13/19
Photo 11	Typical classroom space, third floor	Meredith Arms Bzdak	12/13/19
Photo 12	Third floor, looking west	Meredith Arms Bzdak	12/13/19

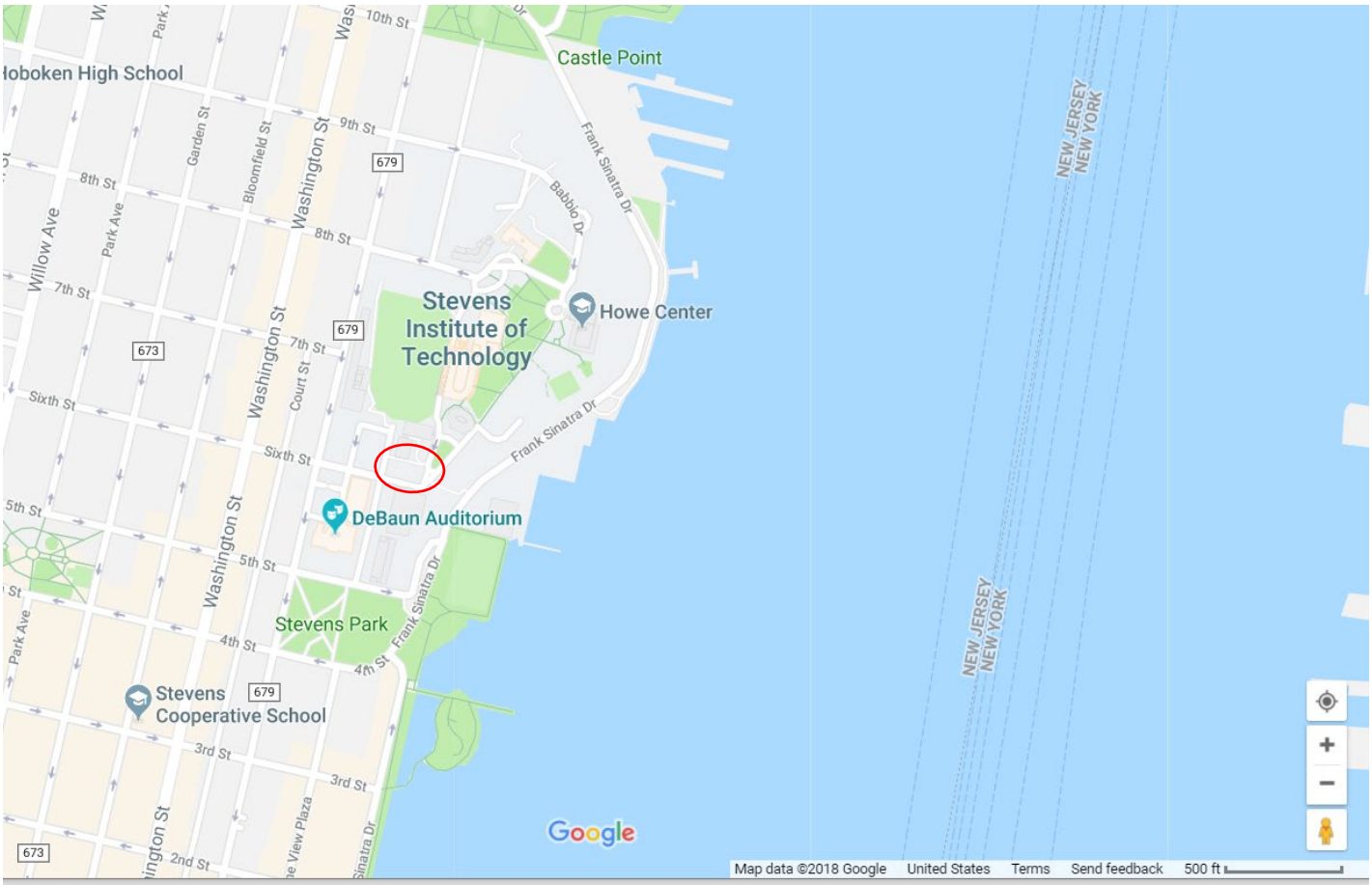


Figure 1. Location of Morton Memorial Laboratory of Chemistry, Stevens Institute of Technology, Hoboken (Hudson County) New Jersey. (Property circled.) (Source: https://www.google.com/maps)

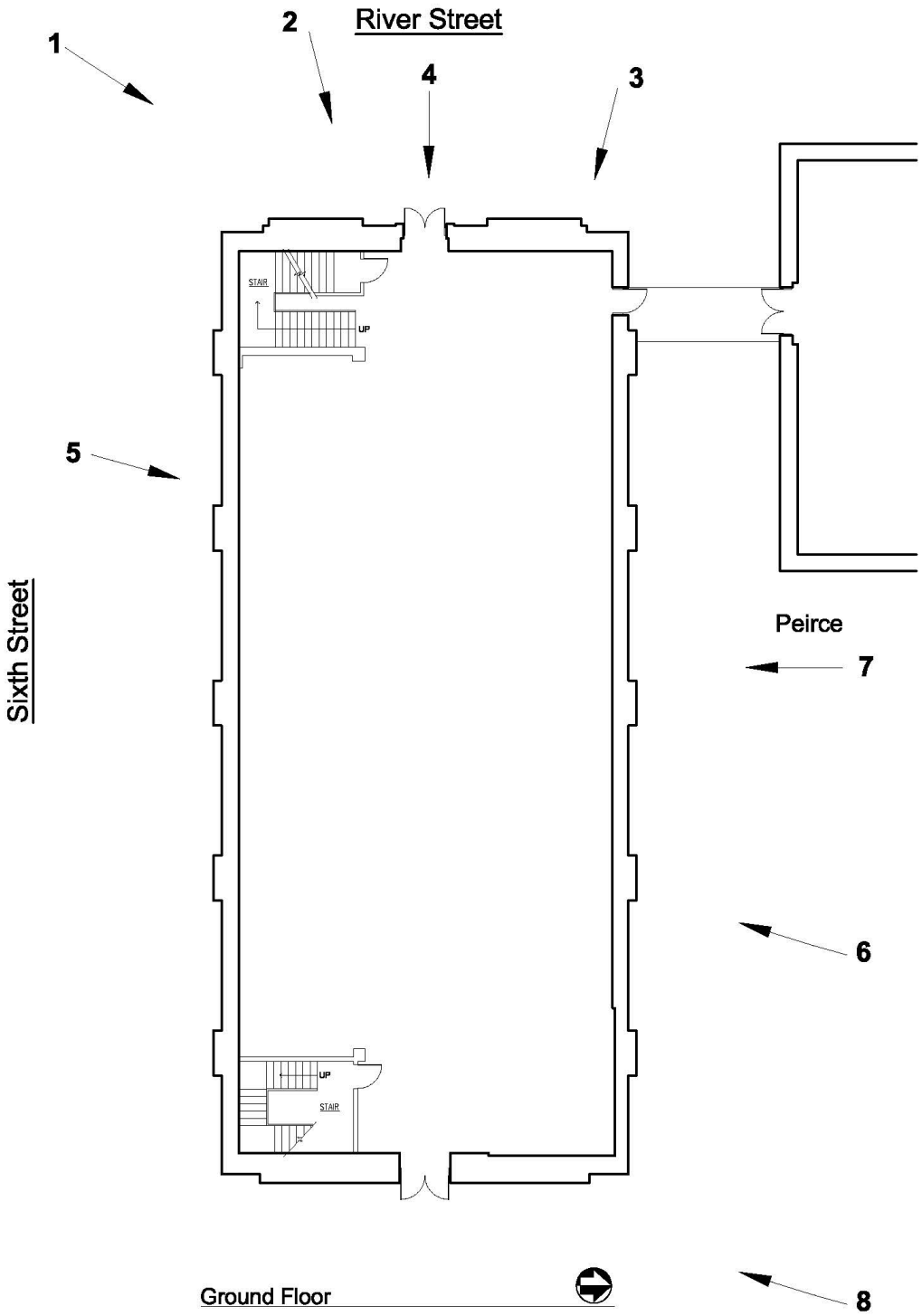


Figure 3. Exterior Photo Key.

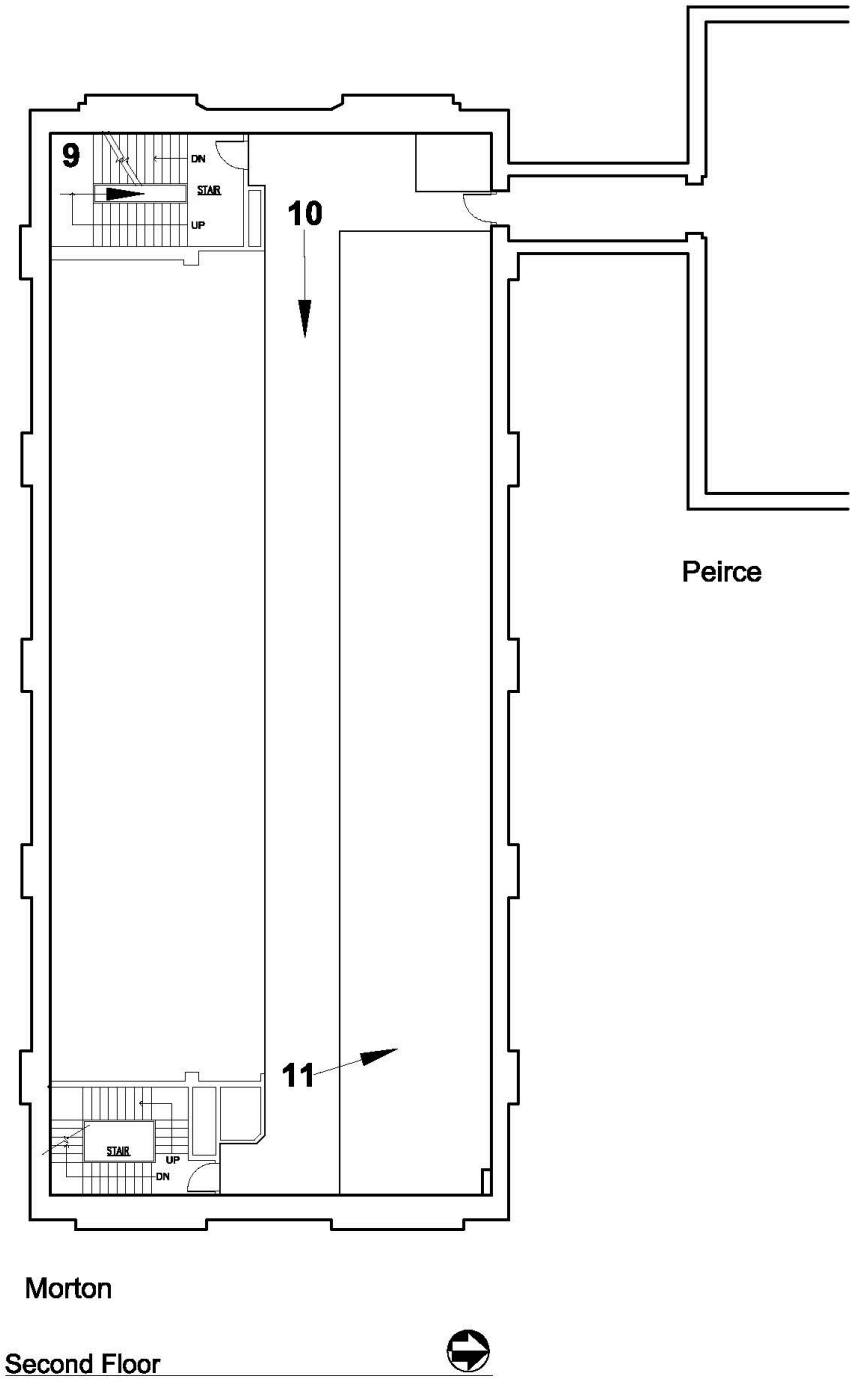


Figure 4. Second Floor Photo Key.

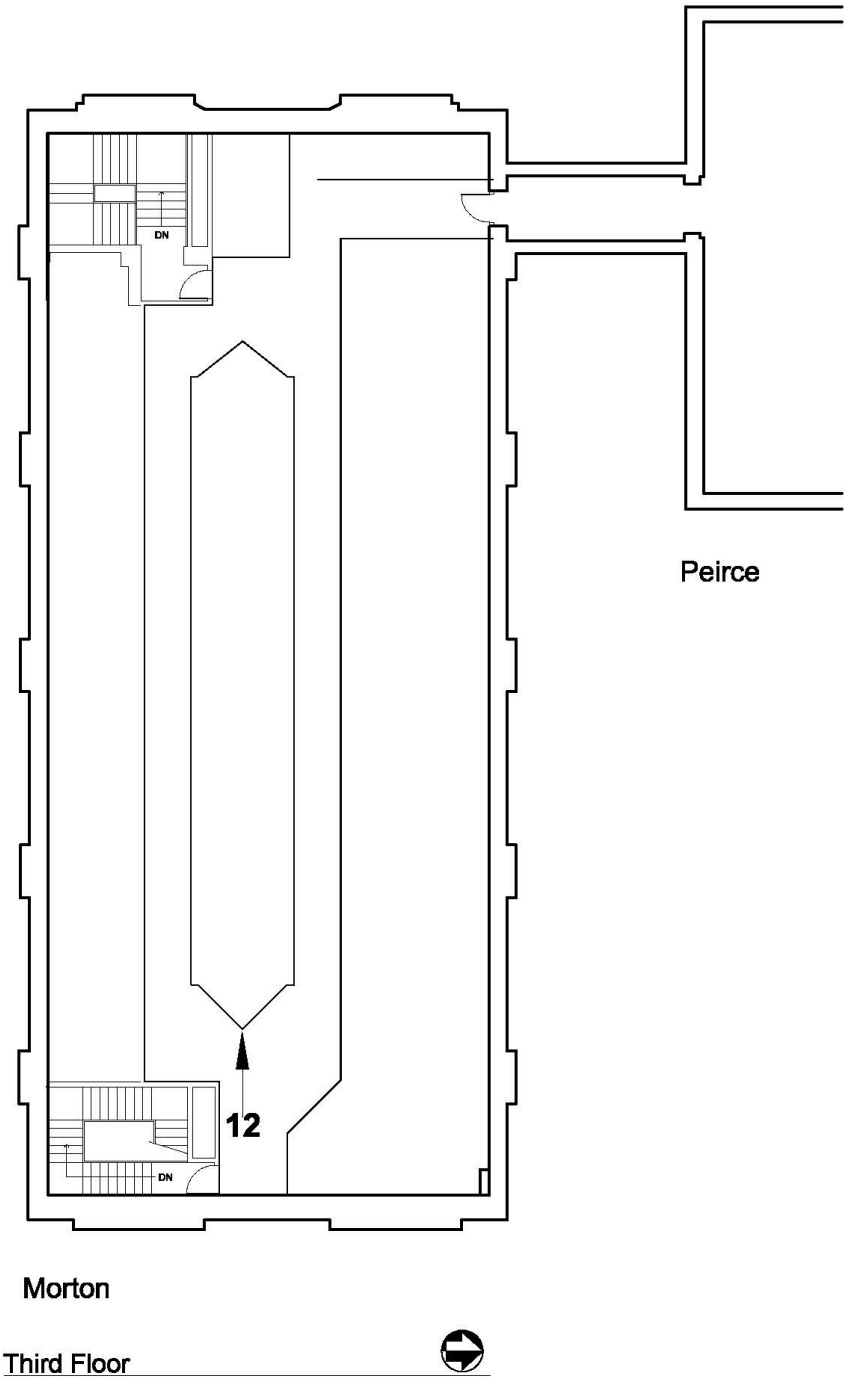


Figure 5. Third Floor Photo Key.

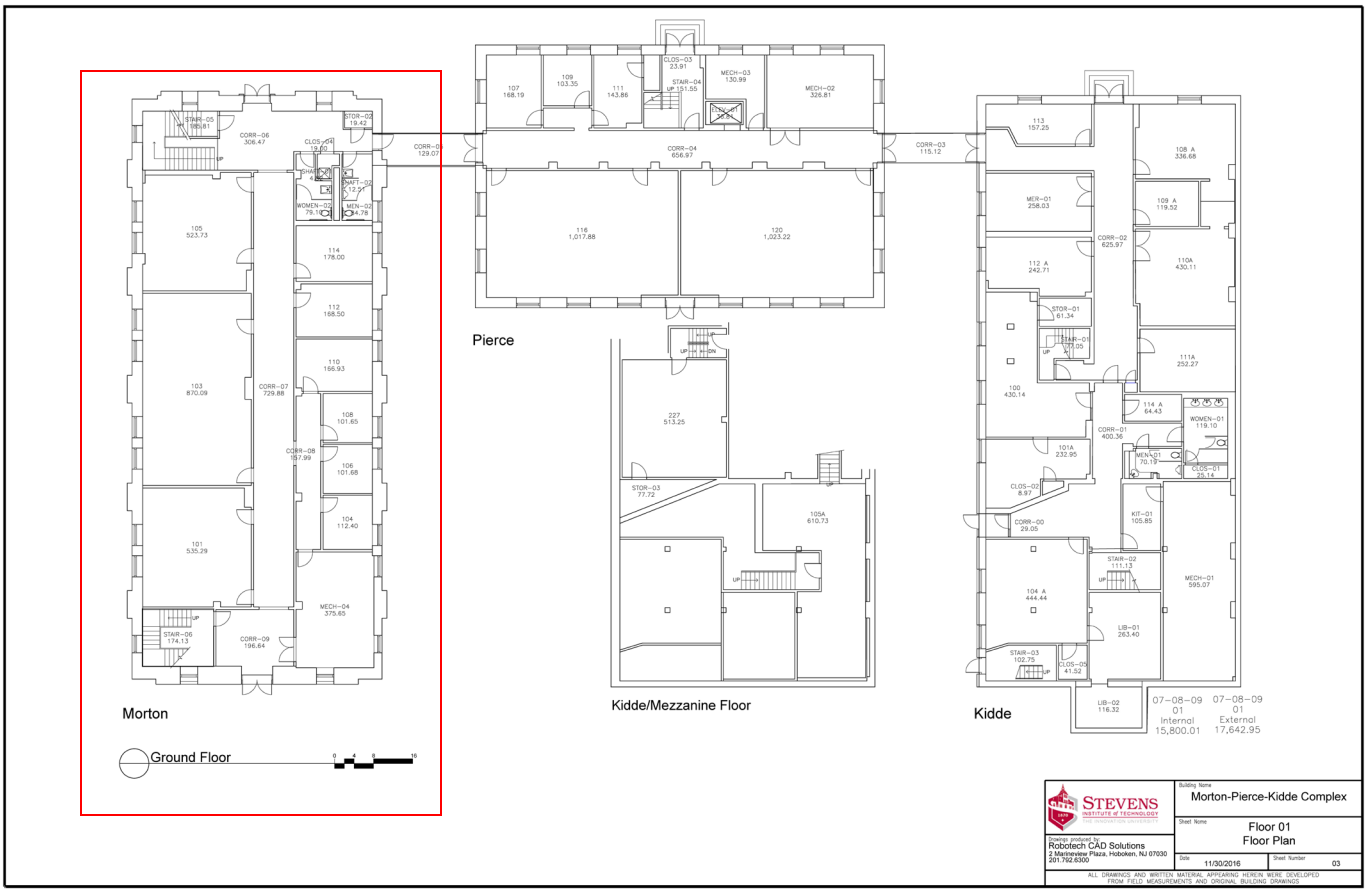


Figure 6. Morton Memorial Laboratory of Chemistry, First Floor Plan, outlined in red (2016).

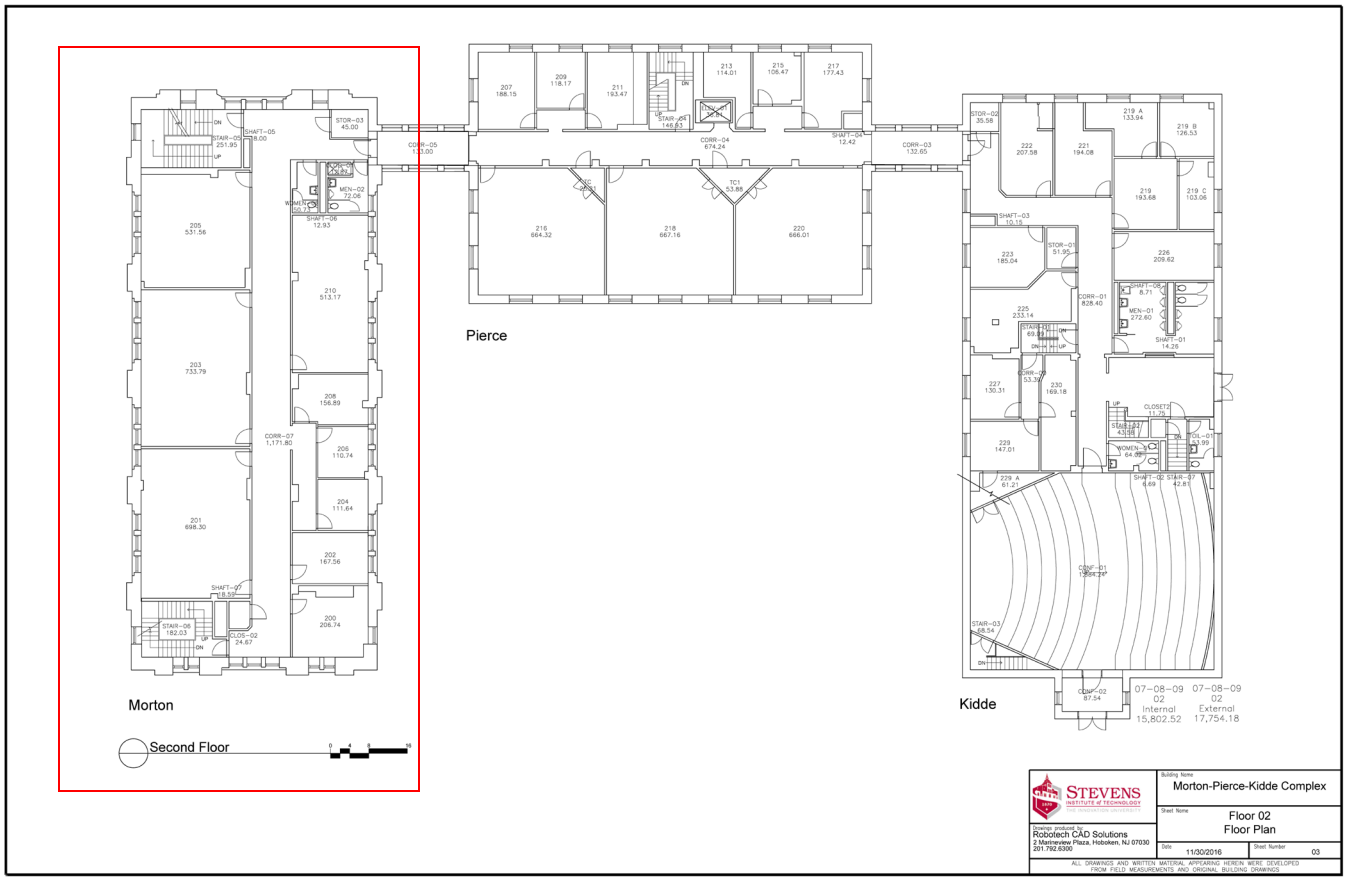


Figure 7. Morton Memorial Laboratory of Chemistry, Second Floor Plan, outlined in red (2016).

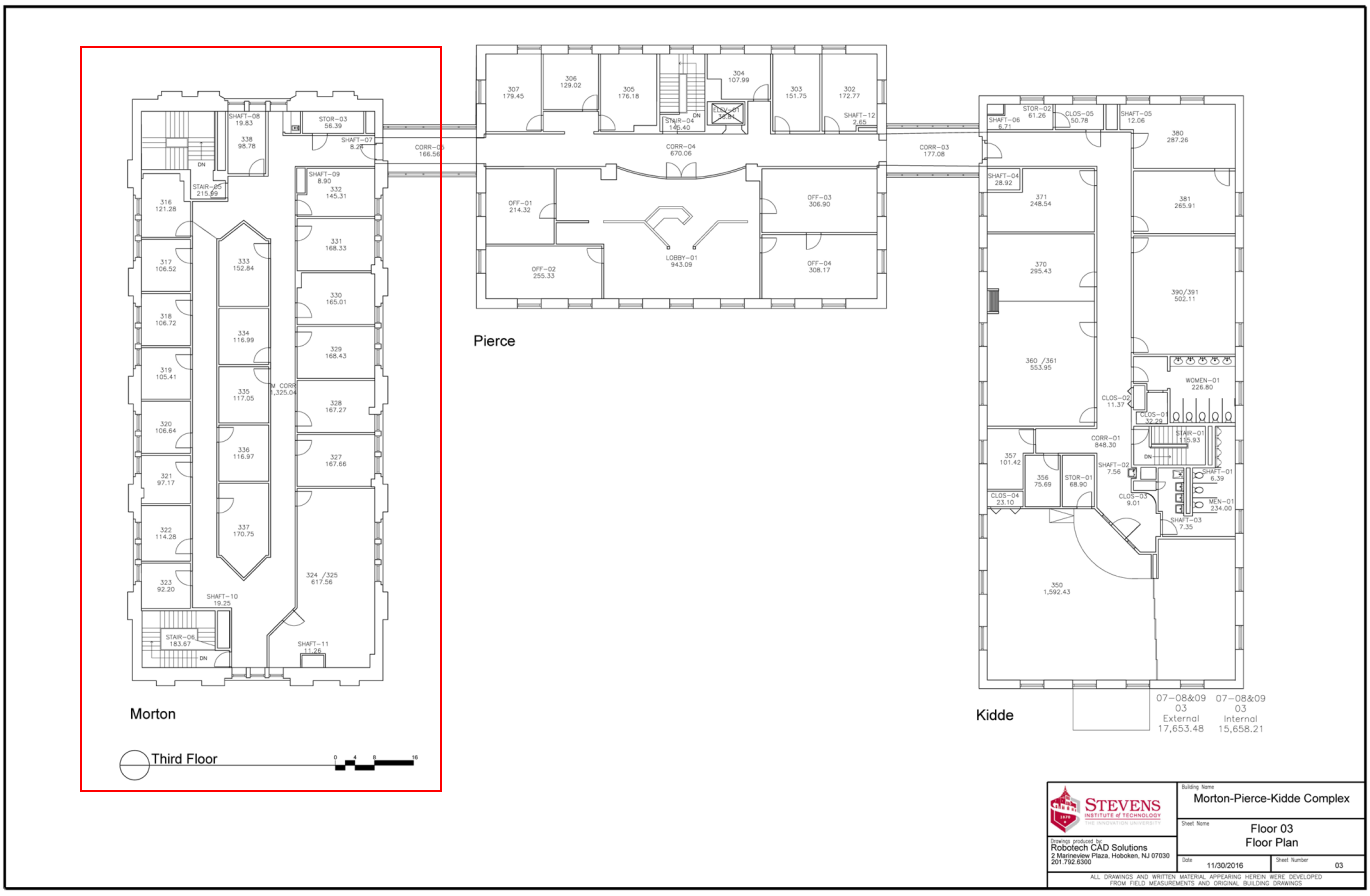


Figure 8. Morton Memorial Laboratory of Chemistry, Third Floor Plan, outlined in red (2016).

Figure 9. Morton Memorial Laboratory of Chemistry (as originally planned) showing Carnegie Laboratory of Engineering and west side of Main Building to the right (Archives and Special Collections, Stevens Institute of Technology).

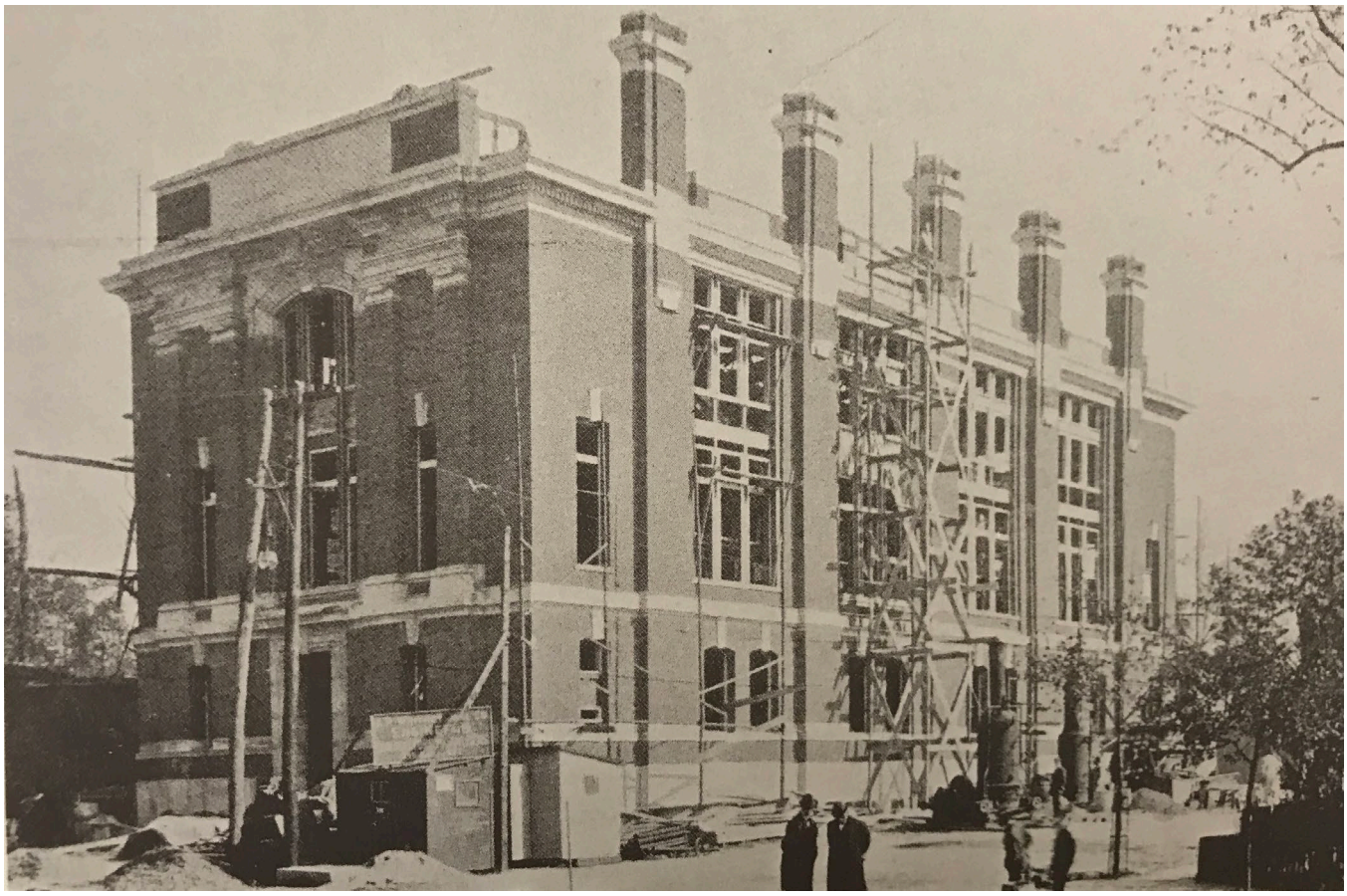


Figure 10. Morton Memorial under construction, 1905 (Archives and Special Collections, Stevens Institute of Technology).

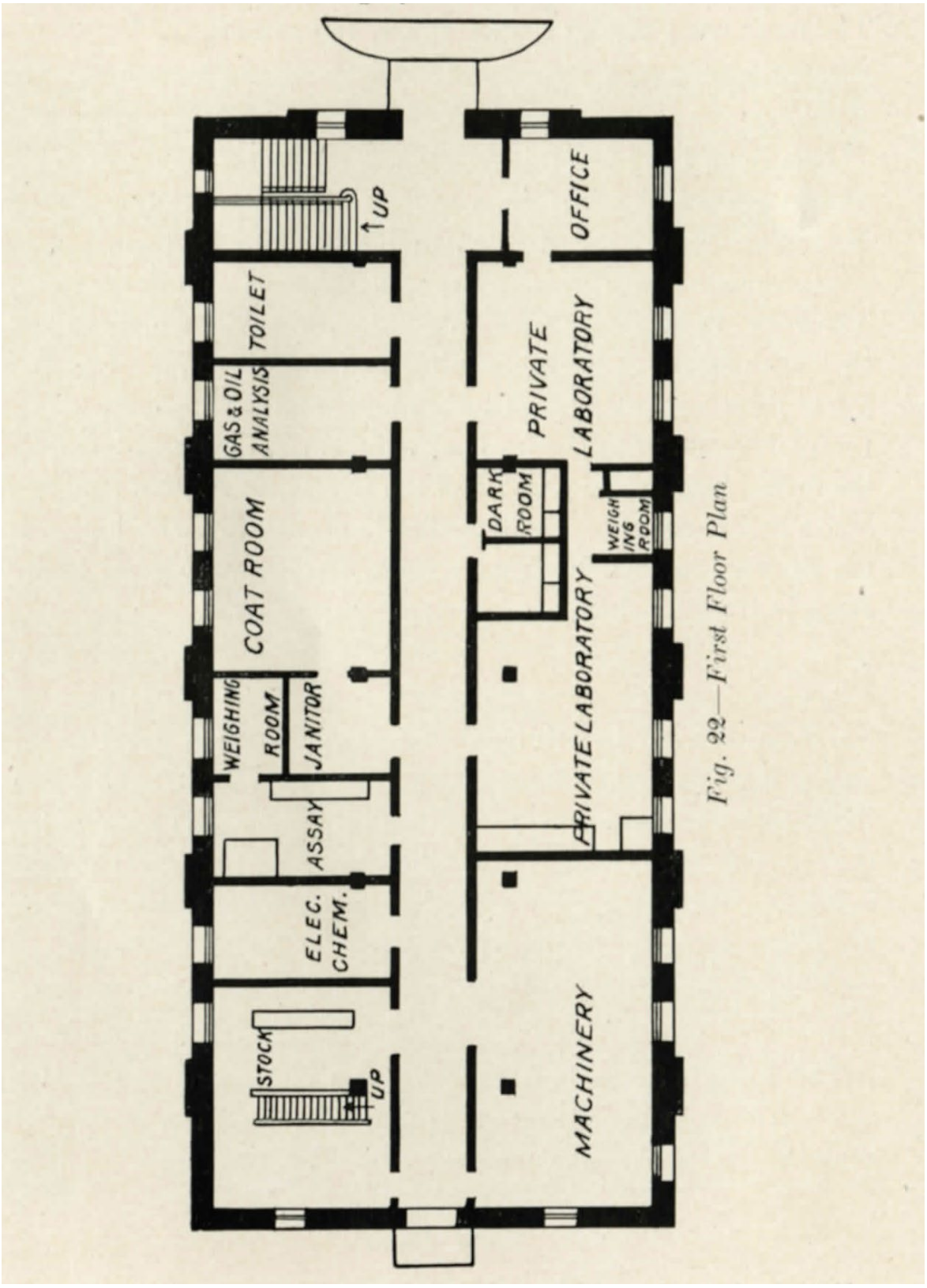


Figure 11. First Floor Plan (F.J. Pond, "The Morton Memorial Laboratory of Chemistry of Stevens Institute of Technology," *Stevens Institute Indicator,* vol XXIII, no. 3, July 1906, 46.)

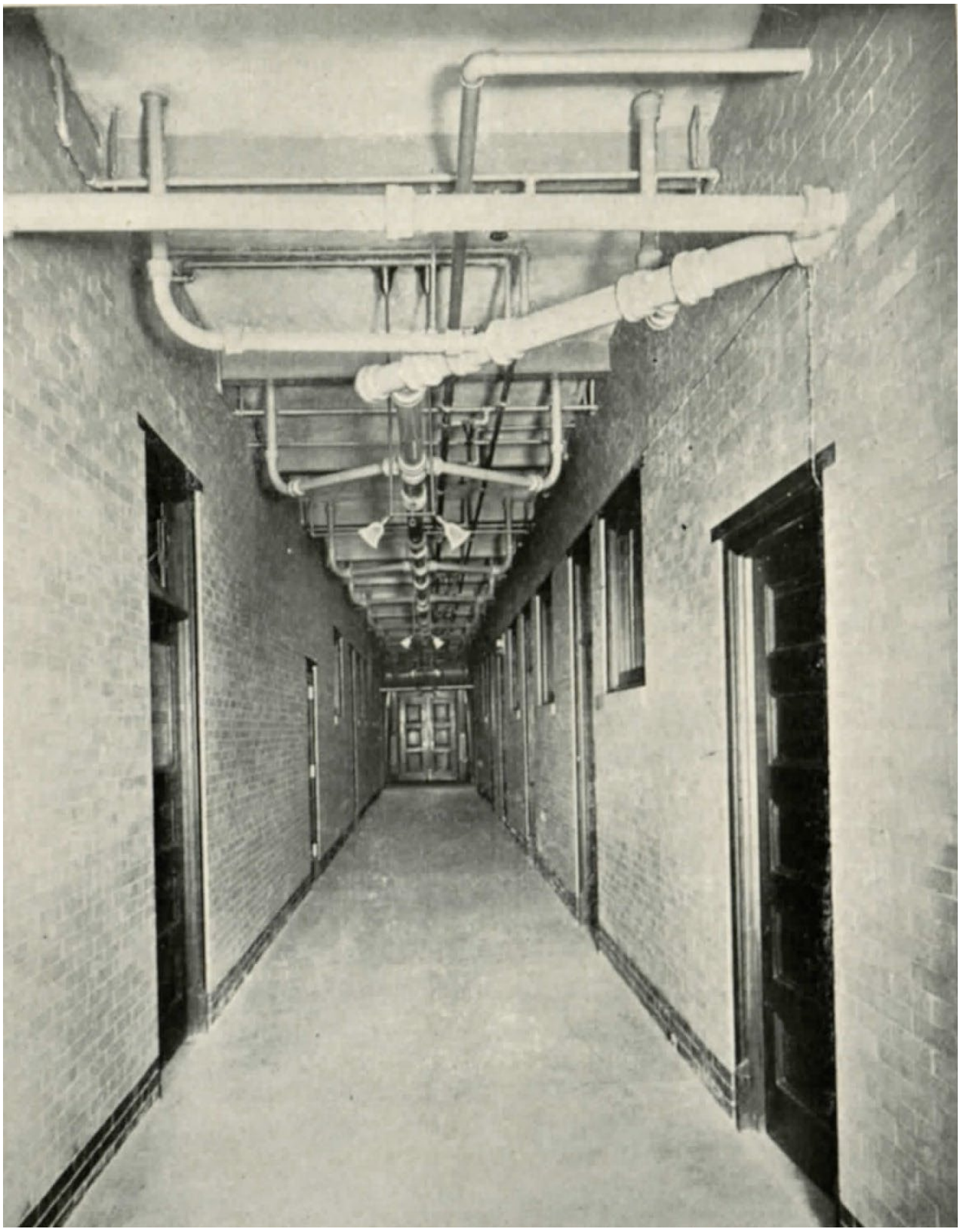


Figure 12. First Floor Corridor (F.J. Pond, "The Morton Memorial Laboratory of Chemistry of Stevens Institute of Technology," *Stevens Institute Indicator,* vol XXIII, no. 3, July 1906, 50).

Figure 13. Stairway and second floor lobby, with entrance to Analytical Laboratory, 1906 (F.J. Pond, "The Morton Memorial Laboratory of Chemistry of Stevens Institute of Technology," *Stevens Institute Indicator,* vol XXIII, no. 3, July 1906).

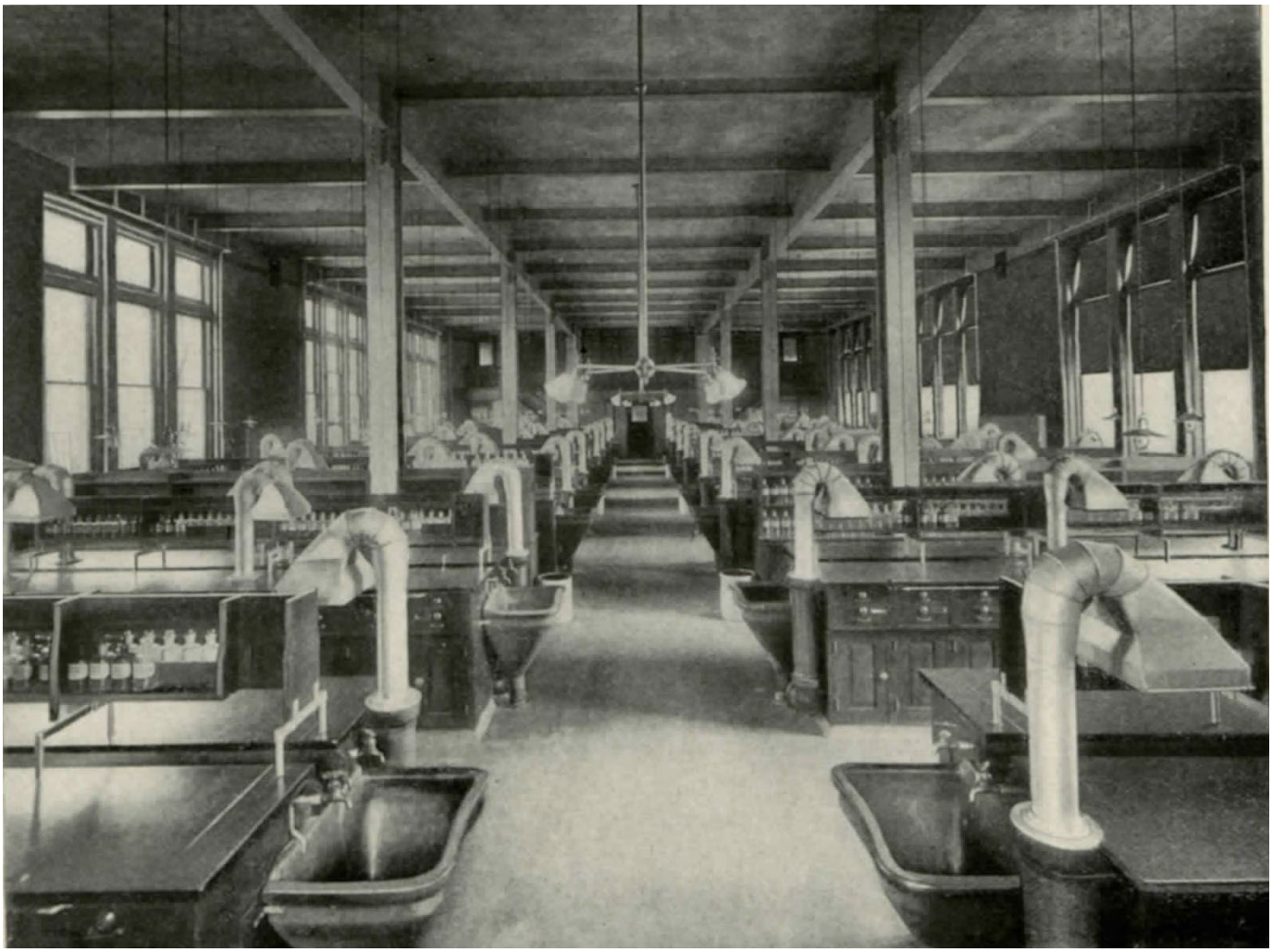


Figure 14. Second Floor Laboratory, with center aisle and large windows on north and south elevations (F.J. Pond, "The Morton Memorial Laboratory of Chemistry of Stevens Institute of Technology," *Stevens Institute Indicator,* vol XXIII, no. 3, July 1906, 20).

Figure 15. Historic image of one of the Second Floor Laboratory in Morton Memorial Laboratory of Chemistry; note hoods at each desk (Archives and Special Collections, Stevens Institute of Technology).

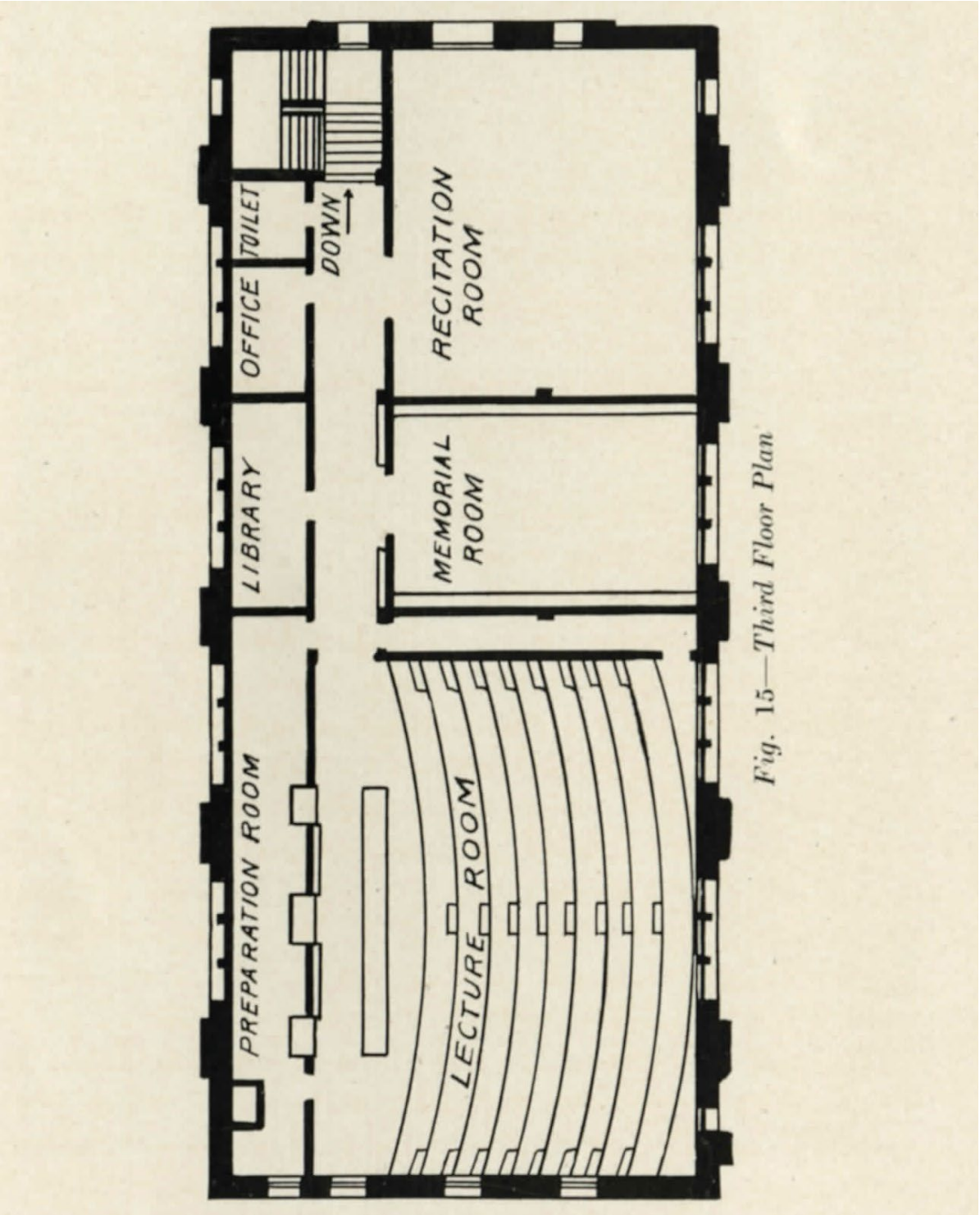


Figure 16. Third Floor Plan (F.J. Pond, "The Morton Memorial Laboratory of Chemistry of Stevens Institute of Technology," *Stevens Institute Indicator,* vol XXIII, no. 3, July 1906, 38).

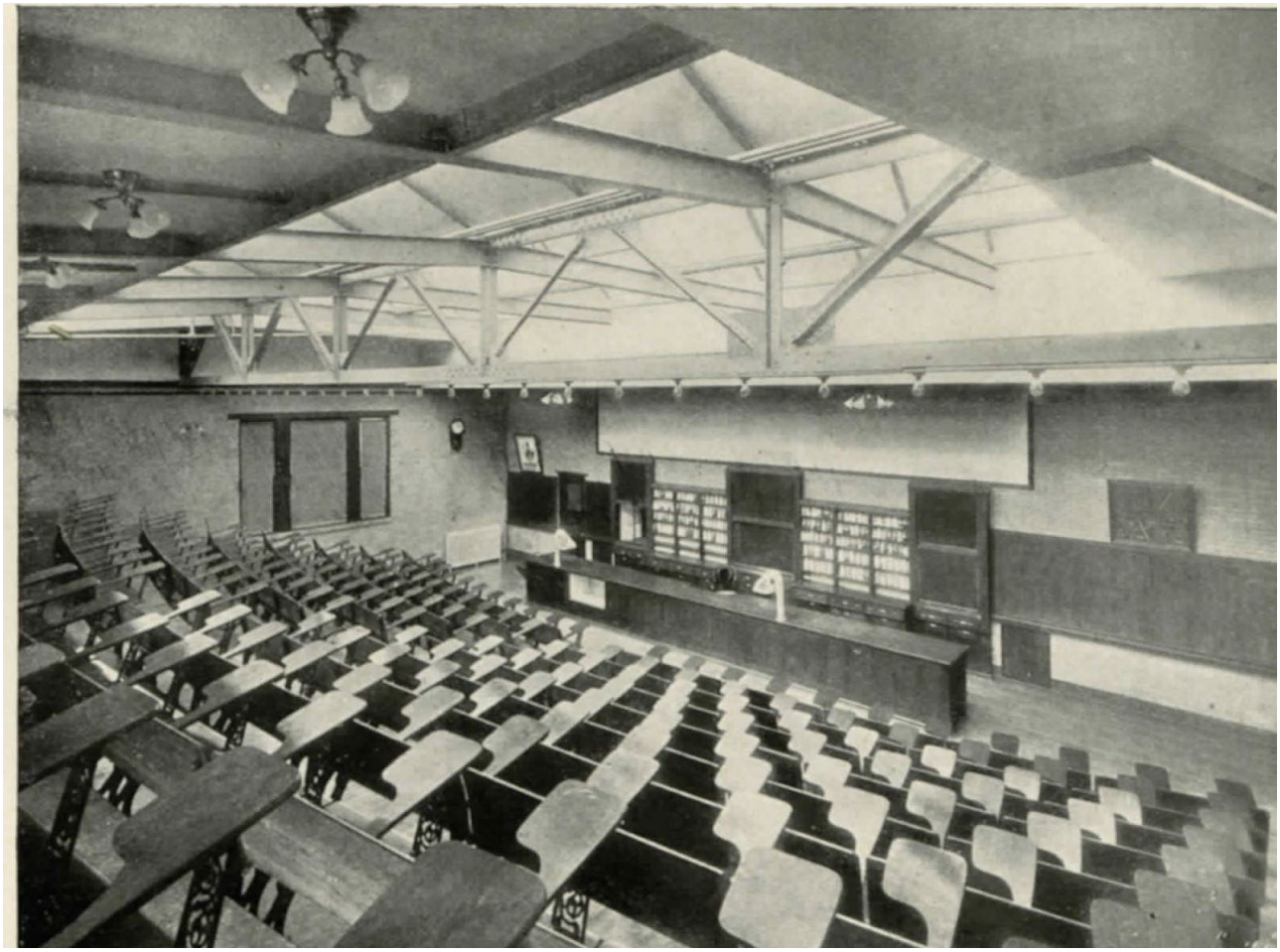


Figure 17. Third Floor Lecture Room (F.J. Pond, "The Morton Memorial Laboratory of Chemistry of Stevens Institute of Technology," *Stevens Institute Indicator,* vol XXIII, no. 3, July 1906, 40).

Figure 18. A 1906 birds eye view of the campus shows Morton Memorial at the top center of the image, with new playing fields and grandstand to its north. Note that the artist has taken some artistic license here, including only Stevens Institute assets (as well as the Castle, which had not yet left family control). The Trenton Building, at 600-602 River Street, stood to the west of Morton at this time, as it had been constructed circa 1881-1891, but is not included in this view. (Archives and Special Collections, Stevens Institute of Technology.)

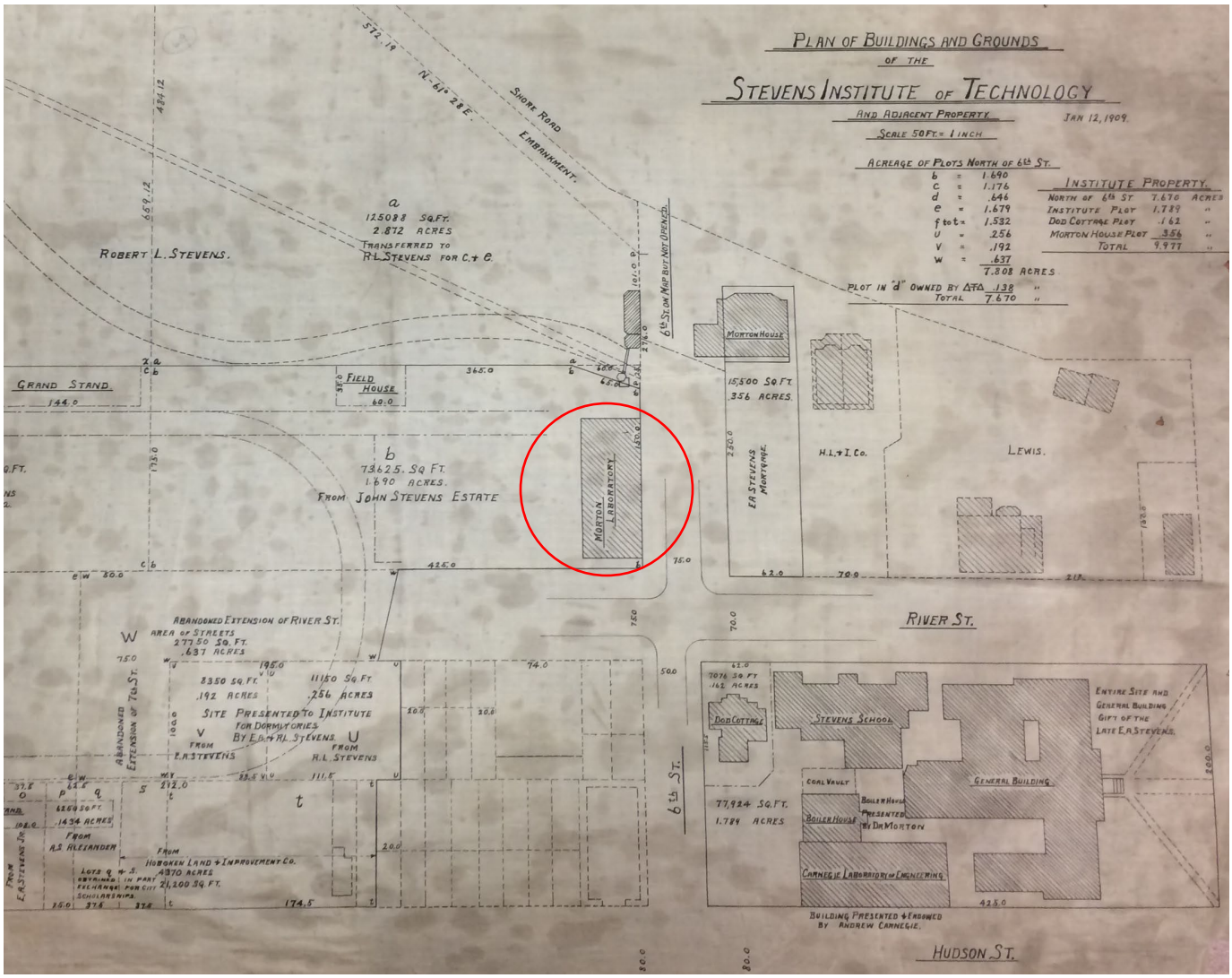


Figure 19. The January 1909 Plan of Buildings and Grounds of the Stevens Institute of Technology shows the recently constructed Morton Laboratory on the northeast corner of River and Sixth Streets. Note it stands adjacent to (but is not connected to) the historic Sixth Street Gate. It was the first permanent Institute building to have been constructed on the Stevens Estate property, although the Institute was utilizing the fields to the north of the Laboratory for athletics. (Archives and Special Collections, Stevens Institute of Technology.)

Figure 20. The new "Castle Point Athletic Field," located to the north of the newly constructed Morton Hall on eleven acres of the formerly private Stevens estate, was completed in 1907 and included a grandstand and a field house (Archives and Special Collections, Stevens Institute of Technology).

Figure 21. Morton Memorial soon after completion, circa 1910 (Archives and Special Collections, Stevens Institute of Technology).

Figure 22. Ludlow and Peabody, Stevens Institute of Technology Campus Plan, circa 1914, as published in *The American Architect*, CXI, no. 2156, 18 April 1917 envisioned the expansion of the Morton Memorial Laboratory of Chemistry to the north, which was not actually undertaken until 1946.

Figure 23. Historic photograph of the south elevation of Morton taken circa early 1920s, with the corner of the Navy Building (completed circa 1919) visible at the right (Archives and Special Collections, Stevens Institute of Technology).

Photo 1. Morton Memorial Laboratory of Chemistry, View of west and south elevations from River Street, with the intersection of River Street and Sixth Street in the foreground. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 2. Morton Memorial Laboratory of Chemistry, main (west) elevation. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 3. Morton Memorial Laboratory of Chemistry, main (west) elevation, looking southeast. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 4. Morton Memorial Laboratory of Chemistry, main (west) elevation, entrance detail showing curved granite forecourt and steps. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 5. Morton Memorial Laboratory of Chemistry, south elevation. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 6. Morton Memorial Laboratory of Chemistry, north elevation, looking southwest. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 7. Morton Memorial Laboratory of Chemistry, north elevation, looking southeast (Peirce Hall at the right). Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 8. Morton Memorial Laboratory of Chemistry, east and north elevations, looking southwest, showing courtyard formed by the addition of Peirce and Kidde Halls. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

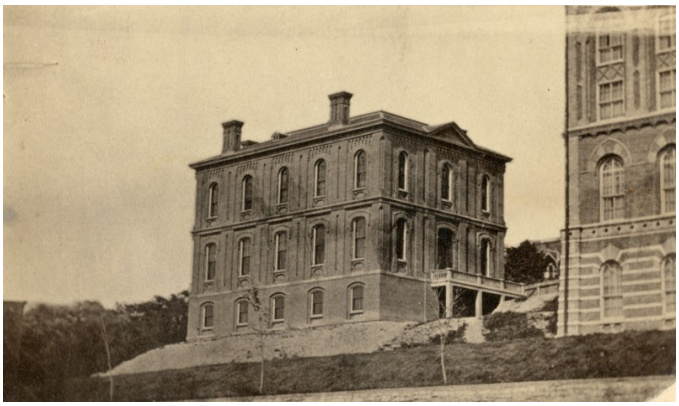
Photo 9. Morton Memorial Laboratory of Chemistry, original iron staircase at southwest corner. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 10. Morton Memorial Laboratory of Chemistry, second floor corridor, looking east. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 11. Morton Memorial Laboratory of Chemistry, typical classroom space, second floor. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo 12. Morton Memorial Laboratory of Chemistry, third floor, looking west. Stevens Institute of Technology, Hoboken (Hudson County), NJ. (Meredith Arms Bzdak, 13 December 2019.)

Photo S1. Ackerman & Ross, Carnegie Laboratory of Engineering, 1901, Stevens Institute of Technology, Hoboken, NJ. (Photo 2017, Mills + Schnoering Architects)



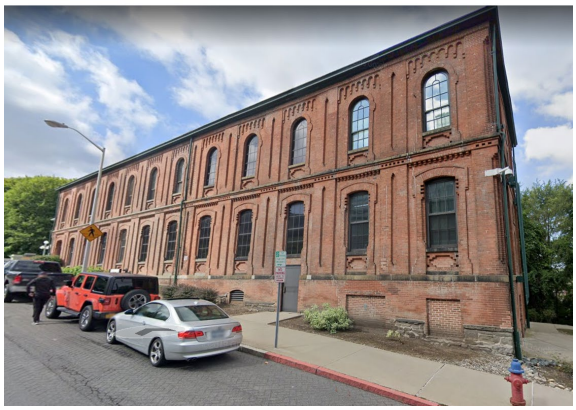


Photo S2. Winslow Chemical Laboratory, 1865, Rensselaer Polytechnic Institute, left photo of west elevation circa 1865-1884, https://archives.rpi.edu/sites/default/files/2020-07/Untitled-2-e1352382765769.jpg. Right photo of east elevation, August 2019, https://www.google.com/maps/@42.7311252,-73.6840504,3a,75y,251.99h,99.97t/data=!3m6!1e1!3m4!1soonPv0EQw-ZKksZ8BfMUAw!2e0!7i16384!8i8192.

Winslow Chemical Laboratory was originally 60 feet by 40 feet and three stories tall. A fire in 1884 destroyed the upper story, and the building was subsequently enlarged. Another fire in 1902 resulted in the addition of a new south wing that increased the building's length by 30 feet. A third fire occurred in 1904. In 1907 the building was converted for use as a mechanical/electrical engineering shop, and a foundry and forge and pattern and machine shops were added. The building was enlarged again in 1930-31 to its present size of 100 feet by 42 feet. The addition essentially replicated the appearance of the original block. The distinctive chimneys are no longer extant.

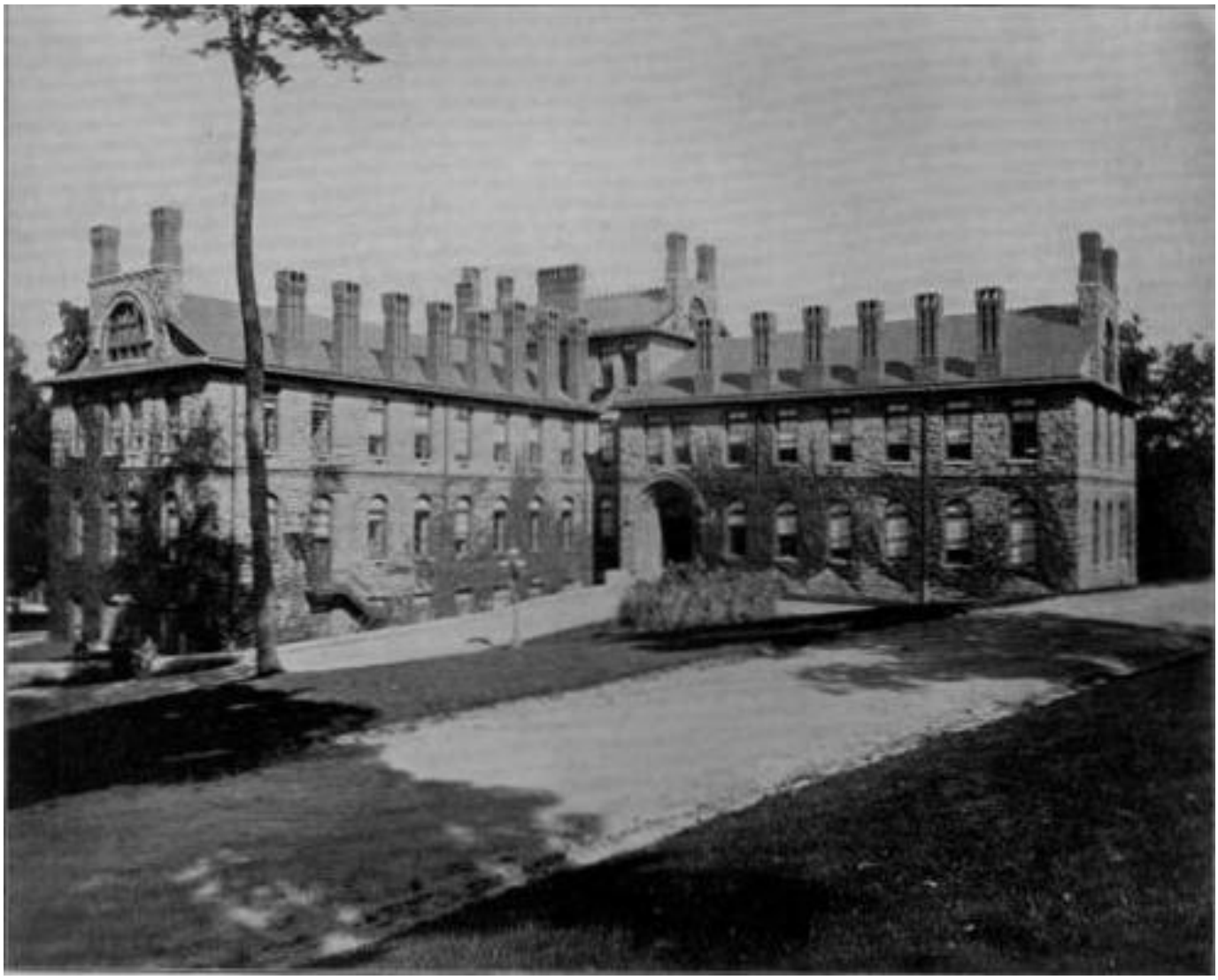


Photo S3. Addison Hutton, William H. Chandler Chemistry Laboratory, 1884-85, Lehigh University, Bethlehem, PA. (Photo circa 1890s, https://commons.wikimedia.org/wiki/File:Chemical_Laboratory_(Chandler)_wing_1896.jpg)

Chandler-Ullmann Hall (as it is now known) was expanded in 1921 and 1938, and no longer serves the chemistry department, which was relocated in the 1970s and the building renovated. It has recently undergone another comprehensive renovation (2018-2019) that further diminished its integrity.

Photo S4. H. C. Koch, Chemical Engineering Building, 1885, University of Wisconsin, Madison, WI. Photo circa 1890, https://onwisconsin.uwalumni.com/features/old-school/)

The building is no longer extant.

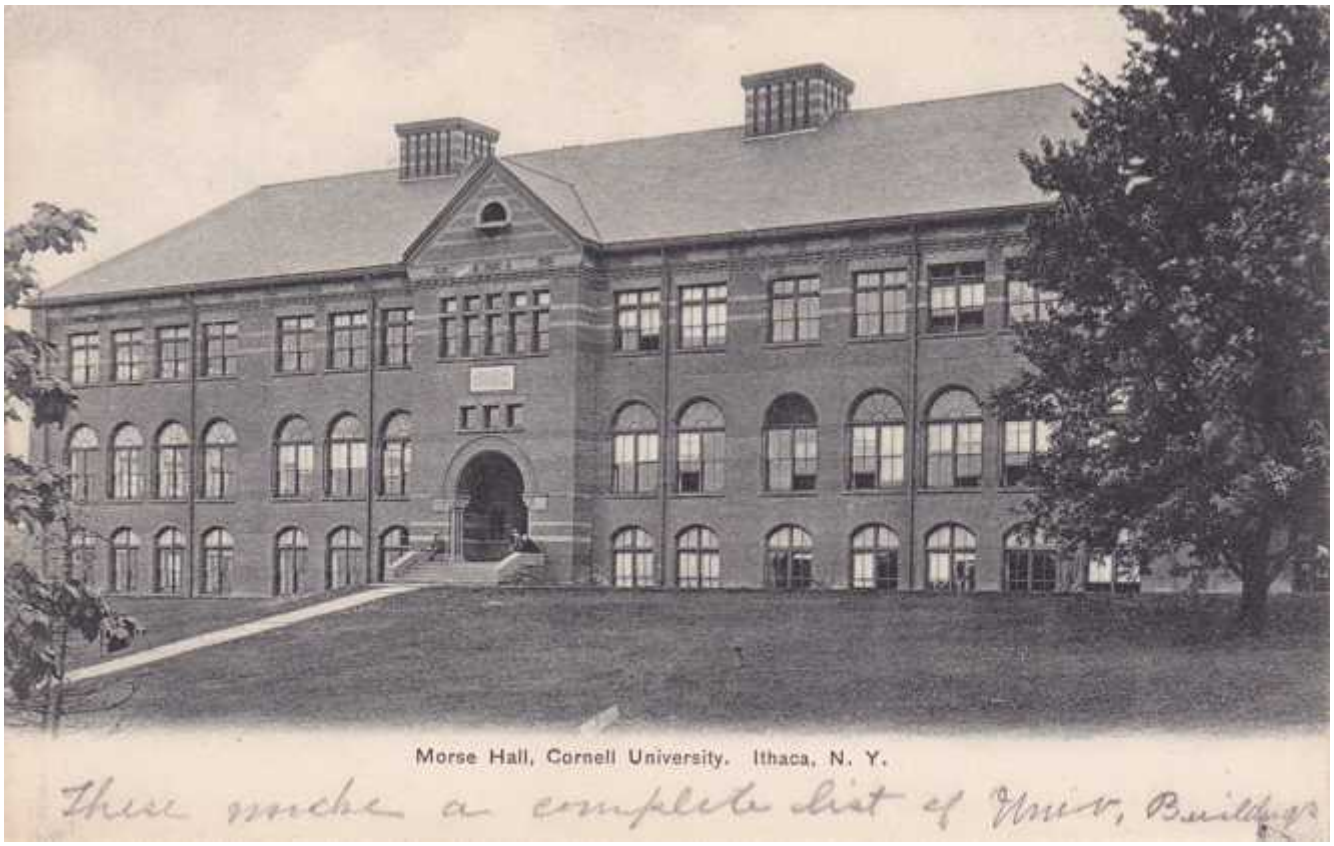


Photo S5. Charles Francis Osborne, Morse Hall, 1890, Cornell University, Ithaca, NY. (Photo circa 1907, https://www.hippostcard.com/listing/morse-hall-cornell-university-ithaca-ny-new-york-udb/1909091)

The upper two stories and most of the basement of Morse Hall were destroyed by fire in 1916; the portions that remained were adapted for use as an Art Gallery and then demolished in 1954.

Photo S6. Harrod and Andry, Richardson Chemistry Building, 1894, Tulane University, New Orleans, LA. (Photo 1977, https://npgallery.nps.gov/GetAsset/f0b2ea3e-a2e3-464e-9202-76c302644423)

Richardson is no longer a chemistry building, but instead houses the advising department for all Newcomb-Tulane undergraduates and classroom space for a variety of subjects, as well as the Center for Engaged Learning and Teaching on the top floor.

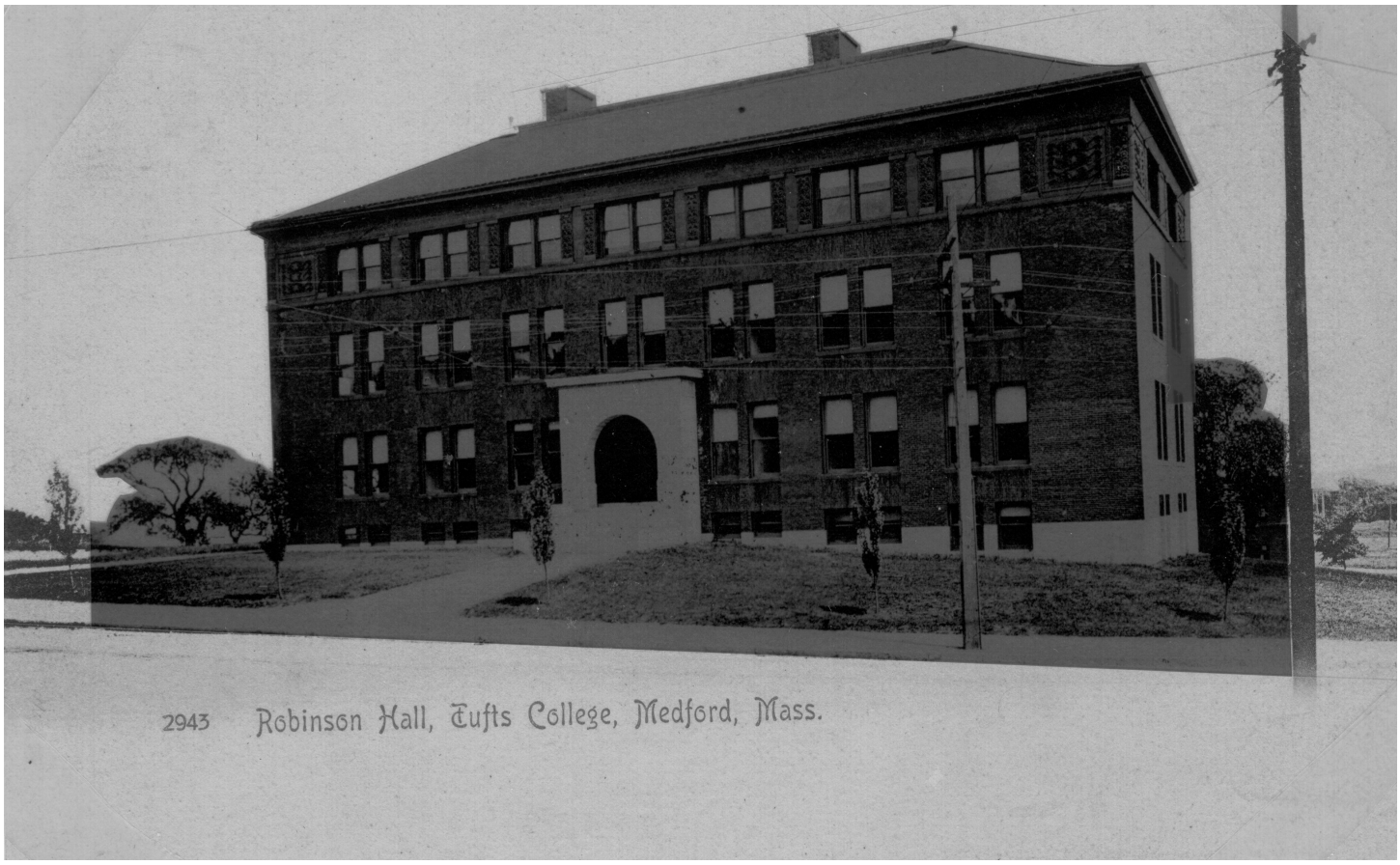


Photo S7. Robinson Hall, 1899, Tufts University, Medford, MA. (Photo circa 1900, http://hdl.handle.net/10427/2755, Digital Collections and Archives, Tufts University)

A renovated Robinson Hall recently became part of a large new state-of-the-art Science and Engineering Complex (SEC) that tripled available space.

Photo S8. Warren Laird, Chamberlin Hall, 1905, University of Wisconsin, Madison, WI. (Photo 2020, DallasFletcher / CC BY-SA (https://creativecommons.org/licenses/by-sa/4.0, https://commons.wikimedia.org/wiki/File:Chamberlin_Hall.jpg).

Chamberlin Hall was expanded substantially multiple times, in 1912, 1939, 1956, and 1973, and fully renovated and reconstructed in 2002. Chamberlin is now home to the University's physics department.

Photo S9. Cope and Stewardson, Towne Hall, 1906, University of Pennsylvania, Philadelphia, PA. (Photo 2007, Public Domain, https://en.wikipedia.org/w/index.php?curid=10808964)

Towne Hall houses the School of Engineering and Applied Science administrative offices and several of its departments.

Photo S10. Smith, Hinchman and Grylls, Chemistry and Pharmacy Building, 1909, University of Michigan, Ann Arbor, MI (Photo undated, circa early 20th century, http://umhistory.dc.umich.edu/mort/original/1925/16%20Chemistry%20Building/index.html)

The building was nearly doubled in size by a 1949 addition.

Photo S11. Chemistry Building (now Ladd Hall), 1910; North Dakota State University, Fargo, ND. (Undated postcard image on the left; recent (undated) photo on the right. https://www.ndsu.edu/alphaindex/buildings/Building::376)

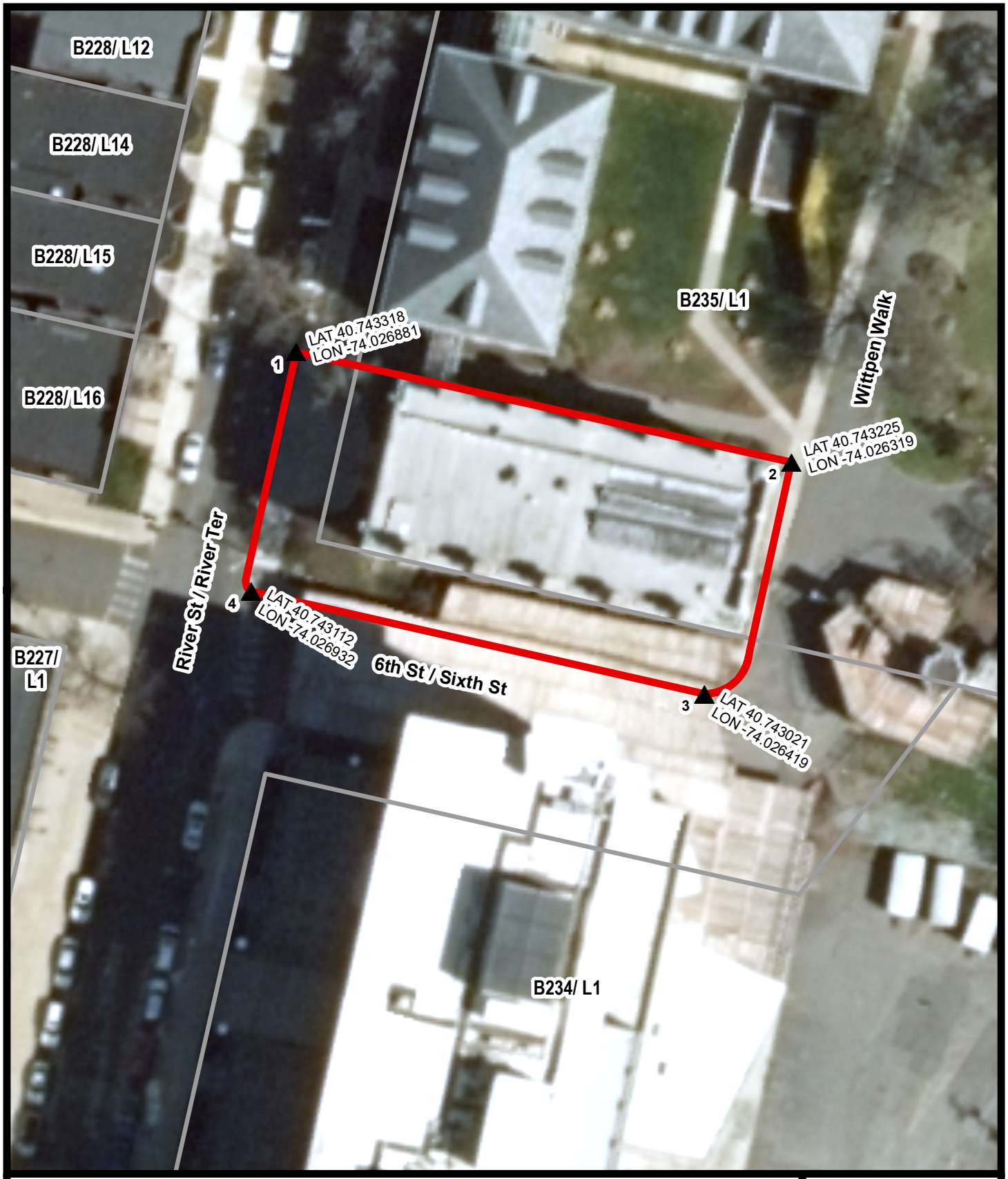
In 1964 a significant modern-era addition was appended to Ladd Hall, essentially doubling its size, and in 1966 all windows were replaced, further diminishing its integrity. A remodeling of the interior was undertaken by the University in the mid-1970s.

Photo S12. Link & Trueblood, Old Chemistry Building (now Brevard Hall), 1923, University of Mississippi, Oxford, MS (Photo 2008, Susan Tietz, https://www.apps.mdah.ms.gov/Public/prop.aspx?view=facts)

Brevard Hall no longer houses the chemistry department and its interior has been remodeled several times.

Photo S13. Charles Z. Klauder, Frick Chemistry Laboratory, 1929, Princeton University, Princeton, NJ. (Photo 2020, Mills + Schnoering Architects)

An addition to the rear of Frick Chemistry Laboratory by O'Connor and Kilham in 1964 doubled its size, and a 1975 renovation project substantially modernized the complex. A new building (also called the Frick Chemistry Building) was constructed for the Chemistry Department in 2010, and the Klauder Building was transformed for use by a variety of academic and administrative departments.



Morton Memorial Laboratory of Chemistry

New Jersey and National Registers Nomination
City of Hoboken,
Hudson County,
New Jersey

Boundary and tax map

Legend

NJ & NR boundary

Coordinates

Tax Parcels

0 10 20 40 60 Feet

Datum: NAD 1983 State Plane New Jersey

0.28 Acres

NJDEP,
Historic Preservation Office
April 2021