MECHANICAL AND AERONAUTICAL ENGINEERING BUILDING
(MECHANICAL ENGINEERING AND AKERMAN HALL):
AN ASSESSMENT OF SIGNIFICANCE

PREPARED FOR

CAPITAL PLANNING AND
PROJECT MANAGEMENT,
UNIVERSITY OF MINNESOTA
300 DONHOWE BUILDING
319 FIFTEENTH AVENUE SE
MINNEAPOLIS, MINNESOTA 55455

PREPARED BY

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PROJECT BACKGROUND AND METHODOLOGY

The Mechanical and Aeronautical Engineering Building (Mechanical Engineering and Akerman Hall) is a contributing building in the Northrop Mall Historic District, which has been determined eligible for the National Register of Historic Places. The building’s potential for designation as an individual landmark, however, has not been evaluated. Capital Planning and Project Management at the University of Minnesota retained Hess, Roise and Company to complete this assessment. Charlene Roise managed the project for Hess Roise, and staff historian Elizabeth Gales prepared the report with research assistance from staff researcher Penny Petersen.

Research was conducted in Hess Roise’s in-house files and library and at several locations at the University of Minnesota: the Engineering Records collection of Facilities Management–Construction Services in Donhowe Hall, Walter Science and Engineering Library, Wilson Library, and the University Archives in the Elmer L. Andersen Library. Staff from the Aerospace Engineering and Mechanics Department also provided information. Current photographs are by Ms. Gales and Ms. Petersen. Historic photographs are from the photograph collections of the Minnesota Historical Society.
DESCRIPTION

Exterior

The Mechanical and Aeronautical Engineering Building (Mechanical Engineering and Akerman Hall) is located at 111 Church Street SE and 110 Union Street SE, in the technology section of the East Bank campus of the University of Minnesota, Minneapolis. Dating from the 1940s, the building is one block north of Washington Avenue SE and is flanked by Church Street SE on the west and Union Street SE on the east. The building has a U-shaped plan, with the opening to the south. The Department of Mechanical Engineering occupies the west and north wings, and the Department of Aerospace Engineering and Mechanics occupies the east wing, which was renamed Akerman Hall in 1980. While the exteriors of the three wings each display a different style described in detail below, all are united by flat roof covered with composite material and concrete. Parapet walls edge and subdivide the roof. Mechanical and scientific equipment is mounted on the roof in several locations.

West Wing (Mechanical Engineering)
The west wing fronts Church Street SE and is connected at its south end to the former Electrical Engineering Building, which was built in 1924. The Electrical Engineering Building is now used by the Mechanical Engineering department. The west wing matches the style, fenestration, and height of the older building. The west facade and the west end of the north facade are three stories of red-brown brick on 

West facade of the west wing

1 Dates in the following description are based on drawings and specifications in the files of Engineering Records, Donhowe Building, and Mechanical and Aeronautical Engineering Building Files, University Archives, Elmer L. Andersen Library, University of Minnesota, Minneapolis.

2 In this report, the building will be known by its historic name, Mechanical and Aeronautical Engineering Building. The wings will be referred to by their relative locations: east, west, and north.

Main entrance on the west facade
a raised basement of Bedford limestone. The entrance on the first story of the west facade projects out from the rest of the building and is flanked by windows. The entrance’s double wood doors have raised panels and glass lights. The wood transom above the doors is ornamented with a wrought-iron screen that has an “M” in the center. The doorway is set in a simple stone surround. The stone cornice above the door is supported by curved brackets, which are the most elaborate decorative elements of the surround. The stone staircase leading up to the entrance has been modified with modern pipe handrails. Wrought-iron light standards with glass globes sit on top of the stairwell walls. On either side of the main staircase, stone steps lead down to single wood-and-glass doors with transoms in the basement level. The projecting entrance is mirrored on the south end of the old Electrical Engineering Building by another entrance.

The remainder of the west wing’s west facade is fourteen bays. Most of the bays hold paired, one-over-one, double-hung sash windows with wood frames. Single-light wood transom windows are located above each window. Most of the windows have screens on the exterior, and many of the transoms and some of the windows have been modified to hold window air-conditioning units. The window frames have not been regularly maintained and are deteriorating. The windows have stone stills and lintels of brick soldiers. The brick lintels over the third-story windows have stone keystones. Brick panels between the windows are outlined by brick stretchers. The windows in the basement level are surrounded by stone. On the west wing’s north elevation, the three bays on the first through third stories have the same paired wood-frame windows and transoms as the west facade. The basement level has no windows. Brick pilasters, which separate the window bays on both facades, are topped by plain stone capitals. The building’s stone cornice is ornamented with flat roundels that are also used on the cornices of other buildings flanking Northrop Mall.

The rear facade of the west wing, its east elevation, is much simpler than the front. The fenestration pattern from the front facade is repeated with the exception of the basement, which does not have windows. The windows are the same paired, wood-frame, one-over-one sash with wood transoms that appear used on the front facade. There is no entrance on the rear facade. There is also no stone cornice above the third-story windows; the plain brick wall forms a parapet that is capped with tile.

**North Wing (Mechanical Engineering)**
The front of the north wing originally held a prominent entrance to the building. With the construction of Rapson Hall (1960) and Shepherd Laboratories (1968) immediately to the north,
the view of this facade was limited. The installation of a two-story walkway between Mechanical Engineering and Rapson Hall at ground level and an elevated, one-story walkway between Aeronautical Engineering and Shepherd Laboratories further obscured this facade. These enclosed walkways are clad in blue-green metal panels with bands of windows that run the lengths of the structures. The walkways are not part of the Mechanical and Aeronautical Engineering Building and will not be discussed any further in this report.

The north wing’s four stories of red-brown brick rise above a limestone-clad basement. Limestone is used for the sills and lintels of the windows on all of the stories. A limestone band also runs across the first story. The north facade’s entrance on the west end has been covered with the two-story enclosed walkway to Rapson Hall described above. Steel-frame industrial-style windows are located above the walkway. The windows are separated by steel-plate spandrels overlaid with decorative cast-iron panels.

Eighteen bays of steel-frame industrial sash windows extend along the north facade. The westernmost bays on the first and second stories are covered by the walkway to Rapson Hall. The remaining windows on the first story are separated by brick walls. On the second through fourth stories, wider industrial-sash windows are separated by narrow metal mullions. The windows look like continuous ribbons of glass running across the wall. On the fourth story, the ribbon of windows is broken in the center of the facade by brick walls flanking a pair of windows. Several of the windows have been modified to hold window air-conditioning units or mechanical vents. At the top of the facade, brick dentils form a cornice on a parapet wall, which is topped by clay tile.
The rear elevation of the north wing, which faces south, has brick and limestone walls matching the north facade and the same type of windows. The separated window openings on the first story and the ribbons of windows on the second through fourth stories are repeated on the south elevation. A bay of single industrial-sash windows on the west end are separated steel-plate spandrels overlaid with decorative cast-iron panels, like the windows over the former entrance on the north facade. The center section of the south wall, containing original passenger and freight elevator shafts and an elevator penthouse on the roof, interrupts the ribbons of windows. A column of single industrial-sash windows separated by spandrel panels is to the east of the freight elevator shaft, which projects outward. On the west side of the shaft, glass blocks fill a three-story opening into a stairwell that wraps around the passenger elevator shaft. New mechanical towers were added to the south elevation as part of a mechanical upgrade in 2000. The towers are do not project above the height of the parapet walls and are clad in brick that matches the building. One tower is located on the east end of the elevation, and completely covers one bay of windows on the north wing and one bay on the rear wall of the east wing. The other tower addition is located west of the elevator shaft and covers one bay of windows on the south elevation of the north wing. A large ten-light transom window and double wood-and-glass doors are located east of the freight elevator shaft on the first story. A small loading dock projects out from the building. A large freight elevator door in the outside wall of the elevator shaft provides access directly into the elevator. A fire-proof storage addition has been built on the west side of the freight elevator shaft in the last decade.

East Wing (Aeronautical Engineering)
The east wing of the building fronts Union Street SE and is also known as Akerman Hall. Like the other two wings, it is clad in red-brown brick with limestone trim. The north facade is set back from the north wall of the north wing. A recessed entrance is located in the setback under a flat concrete canopy with fluted edges. The west
corner of the entrance is rounded and the east corner is a large round pier clad in brick and stone to match the rest of the building. Stone bands with square recessed panels flank the entrance. A pair of metal-frame doors is surrounded by sidelight and transom windows. The transoms have wrought-iron screens with a pattern of squares and rectangles. Large, curved bronze handles decorate the metal-and-glass doors. Steel-frame industrial-style windows are located above the entrance. The windows are separated at each story by steel-plate spandrels overlaid with decorative cast-iron panels. Each panel has rectangular decoration that coordinates with the wrought-iron screen over the entrance.

The north wall is three stories tall and has four bays of steel-frame, industrial-sash windows on each story. Two bays on the second story are covered by an elevated enclosed walkway to Shepherd Laboratories. The east facade is divided into two sections: classrooms and offices on the north side and a hangar on the south side.

A curving driveway from Union Street runs along the front of the basement level of the classroom section. Double wood doors are located at the end of the driveway, on the north wall of the hangar section, and lead into the basement. Steel industrial-sash windows are set in the first and second stories above the doors. The basement level of the east wall has a series of industrial-sash windows covered by metal mesh for security. The classroom section has thirteen bays of industrial-sash windows on the first through third stories. The first-story windows are separated by brick walls and have stone sashes. A stone band runs across the top of the windows and becomes the lintels for the windows. The second- and third-story windows are separated by metal spandrel panels, like those above the entrance on the north wall. Brick headers with stone keystones form the lintels above the third-story windows. A narrow stone cornice runs immediately above the windows topped by a brick parapet wall with clay tile.
The three-story hangar section projects out from the rest of the east facade. A two-story opening holds a tall steel hangar door and steel industrial-sash windows. The door is divided into sections that have solid panels on the bottom with windows on top. One of the sections on the north end has been removed and replaced with two smaller metal doors with windows and spandrels above. The frame above the hangar door has two cast-iron panels decorated with stylized foliage and a row of cast-iron dentils. The windows above the doors are separated by steel mullions. A row of brick soldiers runs across the top of the opening. The third story was added five years after the building was first constructed and makes the hangar taller than the rest of the east wing. The story has three bays of windows. The two end bays have smaller paired industrial sash windows. The central bay is larger with steel panels below the windows. The window and panels originally opened to allow cranes to lift equipment into the building. All of the openings have lintels of brick soldiers. The brick parapet wall is stepped up in the center and topped with clay tile.

The south wall of the east wing is the south wall of the hangar. It has four bays of industrial sash windows on the first through third stories. Limestone bands run below and above the first-story windows, and the second-story windows have stone sills. The west wall of the wing is divided into classroom/office and hangar sections, like the front facade. The brick and stone used on the other walls are matched on the west elevation. The hangar section has three bays of windows on the first through third stories. A large brick mechanical tower, built in 2000, is located next to the northernmost bay of the hangar. The tower does not cover any openings, the brick used on the addition matches the rest of the building, and the addition’s form and height do not overwhelm the rest of the building. North of the tower, a flat concrete canopy with fluted edges projects out from the first story over an entrance. The doorway is surrounded by stone, and a stone panel above the door is decorated with a carved star and circle. The doors have the same curved bronze handrails as those used on the north entrance. A two-story
opening above the entrance is filled with glass blocks. North of the entrance, six bays of industrial-sash windows and metal spandrel spandrels are located on the first through third stories. Most of the windows are covered with metal awnings that were installed in 1964. Like the other windows on the building, the units have been altered to hold window air-conditioning units.

**Interior**

The interior of the building is composed of central corridors leading to offices, classrooms, laboratories/shops, and restrooms on the first through fourth floors. The basement level has classrooms and offices in the east and west wings, but the north wing is closed off from the public and mostly holds facility equipment.

The corridors on the basement and first through third floors of the west wing run on a north-south axis the length of the building. The corridor is not centered in the building, and is instead closer to the west side. The corridors in the north and east wings also run the length of each wing. The north wing corridor on the first through fourth floors is closer to the south wall of the building. The basement did not originally have a central corridor, but walls have been added on the west end of the building to create a corridor that follows the same line as the floors above. The corridor in the east wing sits closer to the west side of the wing on the basement level through the third floor.

The corridor finishes differ depending on the building wing. The east- and west-wing corridors have linoleum-tile floors with rubber baseboards. The walls are cement plaster and the ceiling is suspended plaster. The walls in the east wing are painted white and cream with a dark red stripe running along the middle of the wall. On the second and third floors, lockers are set in the east side of the corridor. The walls in the west wing are also white and cream, but with a dark green stripe. The north wing has shop space and harder materials have been used throughout the wing. The corridors have sealed concrete floors with rubber baseboards.

**Entrance**

**Corridor, second floor, Akerman Hall**
baseboards. The walls are concrete block with some areas of cement plaster. Like the west wing, the walls are painted white, cream, and green. The ceiling is suspended cement plaster except on the fourth floor, which is a concrete slab.

The offset corridors create more floor space on one side of each wing. In the west and east wings, most of the larger spaces are used as classrooms and offices. On the first floor of the east wing, a former laboratory space has been subdivided into small offices. The large spaces in the north wing are occupied by shops and offices, depending on the floor. In some of the shops, original machinery is intact in its original location and still in use. Most of the laboratories have new equipment, especially computers, that has been fit into the existing laboratories. Electrical wiring in metal duets run throughout the north-wing shops to provide easy access to a power source.

The finishes throughout the building are simple and resilient. The classrooms and offices in the east and west wings have carpeted or tiled floors. The walls are cement plaster, and the ceilings vary from original suspended plaster ceilings to newer suspended acoustic-tile ceilings. The laboratories and shops in the north wing have sealed concrete floors, concrete-block walls, and cement-plaster ceilings. Offices and laboratories/shops on the third and fourth floors of the north wing retain concrete-block partition walls with original steel industrial-sash windows mounted in the walls between the corridors and the offices and laboratories. Ductwork and pipes are exposed in the shops, laboratories, offices, and classrooms, but not in the corridors. The building does not have central air conditioning but does have central radiant heating. Mechanical equipment ventilates shops and laboratories. Ductwork for the equipment often runs through windows. The building lacks a sprinkler system.
Several original doors are located throughout the building. The painted solid, wood doors hold large panels of clear, ribbed glass. Door numbers and room titles are usually painted on the glass. Doors have been slowly replaced or modified because the original doors do not meet fire code. Modified doors have new tempered glass panels and new hardware. Replacement doors are hollow-core, flat-panel metal doors. On the fourth floor of the north wing, original metal blast doors are extant on rooms used as test cells.

A freight elevator and passenger elevator are located in the north wing. The elevators access the basement level through the fourth floor. The passenger elevator is very narrow and cannot accommodate a wheelchair. The building also has four staircases, all of which are open and do not conform to current fire code standards. The staircase in the south end of the east wing is near the entrance on the west side. It accesses the basement and first through third floors. The staircase is steel with pipe handrails and concrete-filled steel-pan steps. A staircase at the junction of the east and north wings runs from the basement to the third floor. The poured-concrete steps wrap around an opening in the center of the staircase. The walls of the staircase are cement plaster with steel-pipe handrails. A third staircase is located on the south wall of the north wing. The staircase wraps around the passenger-elevator shaft, and provides access to the basement, first through fourth floors, and elevator penthouse. The stairs are poured concrete, and like the other staircases, there are pipe handrails. The staircase is narrower than the other main staircases in the building. On the third floor, a narrow staircase near the northeast corner of the north wing accesses the third and fourth floors and the roof. Like most of the other staircases, the steps are poured concrete and with pipe handrails. Access to the staircase is limited.
The fourth staircase is located at the junction of the west and north wings. The south flight of the staircase and a ramp on the north side provide a transition between the floors of the north and west wing, which are at different levels. The floors in the west wing are higher than those in the north and east wings. A staircase between the south staircase and the ramps accesses the basement and first through fourth floors. The stairs and ramps on all floors are poured concrete with steel pipe handrails. The steps are covered in linoleum tiles or non-skid coating.
**Hangar**

The largest open space in the building is the two-story hangar on the south end of the east wing. A third floor is above. The hangar has a reinforced-concrete mezzanine along the north, west, and south walls at the elevation of the second floor of Akerman Hall. The hangar has unsealed concrete floors, concrete-block walls, and concrete-slab ceilings. Ductwork and pipes are exposed in both the hangar and the third floor. Small office/conference rooms are located in the northeast corner of the first and mezzanine floors. The conference room on the main floor has been separated from the hangar by the hallway. Original steel industrial-sash windows in the room’s south and west walls have been modified. The south window was covered with gypsum board to improve the fire rating in the hallway. The west window has been removed and fire-rated glass installed in the opening. The conference room on the mezzanine level has most of its original finishes, including the original wood-and-glass door and steel industrial-sash windows. Under the mezzanine, a small shop was recently added to the south wall. Part of the north side of the hangar was enclosed in 2000 to create a hallway that leads to the entrance in the modified hangar door on the east facade of the building. The mezzanine floor was extended to cover both non-historic additions.
A circular steel staircase was located in the northwest corner of the hangar, but was recently removed because it was a safety hazard. With the removal of the staircase, there is no access within the hangar between the main and mezzanine floors. Each level is accessed through doors on the first and second floors of Akerman Hall to the north.

A steel staircase in the northwest corner of the mezzanine is the only access to the third floor, which was added in 1954 to house two wind tunnels that are still in use. The third floor is open with a small alcove in the southwest corner that originally contained an electrical power source. In 2000, new electrical vaults were installed under the parking lot behind the building, and the electricity for the wind tunnels was relocated there.

Exposed steel trusses and I-beams support the ceiling above the main and mezzanine floors. The tracks for hoists are suspended from the trusses and the underside of the mezzanine. The concrete-slab ceiling on the third floor is supported by steel posts and I-beams.

OVERVIEW HISTORY OF THE MECHANICAL AND AERONAUTICAL ENGINEERING BUILDING

Beginnings
The creation of the Mechanical Engineering program at the University of Minnesota was part of a reorganization of that institution in 1868. The university was founded in 1851 by the territorial legislature, following the model of Harvard, which was created not long after settlement in Massachusetts. The legislature’s schools committee recognized that the university would not “mature” for several years, but wanted the institution to receive a land grant to help it get started. Originally located in Chute Square in Saint Anthony (now the east bank of Minneapolis), the university was moved downstream to its current location and construction of Old Main begun shortly before a nationwide financial panic in 1857. The university’s finances were overextended and in 1862, the legislature ordered the board of regents to eliminate the university’s debt of $80,000. The board’s secretary, Richard Chute, convinced John S. Pillsbury, one of the university’s creditors, to convene a special board of regents to find a way to get the institution out of debt. Pillsbury convinced Orlando C. Merriman and John Nicols to join him. The three men spent the next five years raising money by selling land granted to the university.

They also negotiated with creditors who had inflated the debt owed them by the school, convincing them to lower the amounts.\(^4\)

In 1867, Pillsbury, now a senator in the Minnesota Legislature, reported to his legislative colleagues that the debt was cleared. The legislature granted an appropriation of $15,000 to repair the university’s building, Old Main, which had been occupied by squatters during the school’s insolvent period. The funding also created a new preparatory school to be conducted in Old Main. Richard Chute’s son, Charles, was enrolled in the new university and convinced friends to attend as well. The board of regents also agreed to admit women on equal terms with the men. Pillsbury, who would become a milling magnate and governor of Minnesota, considered the university his first cause. He likely used his position as a state senator in 1868 to further strengthen the institution by making it the recipient of lands granted in the Morrill Act.\(^5\)

The Morrill Act was sponsored by Vermont representative Justin Morrill, who was concerned that land in newly opened territories would be exhausted by poor farming practices. The act called for the distribution of 6 million acres of public land among states that created colleges dedicated to agriculture and the mechanic arts. Morrill first brought his act before Congress in 1859, but it was vetoed by President Buchanan. After another try, it became law in 1862, and the Minnesota Legislature passed legislation to accept the grant and its conditions in early 1863. The state was given a total of 120,000 acres of land (30,000 acres for each member of the Minnesota delegation in Congress). Proceeds from the sale of the lands were placed in a perpetual fund to support the new college of agriculture and the mechanic arts. There was competition for where this college would be located. A group in Glencoe, led by John H. Stevens, succeeded in getting the legislature to pass laws in 1858 and 1865 creating a state agricultural college in McLeod County. The Civil War and the Dakota War of 1862, however, thwarted the construction of the college in that county. After the Civil War, the legislature did not make appropriations for buildings for the new college, nor did it transfer land titles so the college could use the Morrill Act lands for financing. After the university returned to secure financial footing in 1867, the legislature passed a new bill that quashed the college in Glencoe and created an agricultural and mechanic arts college within the University of Minnesota. The university was formally reorganized in the 1868 law to include a “central college of science, literature, and the arts and


associated colleges of agriculture and mechanic arts, law, and medicine, as well as for a department of elementary education."  

The enrollment was low during the early years of the College of Agriculture and the Mechanic Arts and the curriculum was disorganized. The development and growth of the mechanic arts program took several decades. The first courses in civil and mechanical engineering were not offered until 1871, and the next year, the agriculture and mechanic arts programs became separate colleges. By 1886, the legislature felt that the mechanic arts program had “become sufficiently diverse and useful” and funded the department’s first building, which was designed by Minneapolis architect Leroy Buffington. Civil and mechanical engineering were housed under the mechanic arts title; electrical engineering was added to the curriculum in 1887. As the program placed more emphasis on engineering, the college was reorganized in 1892 to include engineering, metallurgy, and mechanic arts in the curriculum. Five years later, the metallurgy component was removed, leaving engineering and the mechanic arts. An architecture and architectural engineering program was created in 1912 and grouped with the other engineering degrees. In 1935, the College of Engineering and Architecture, the School of Chemistry, and the School of Mines and Metallurgy were gathered under the Institute of Technology.

6 Quote from Folwell, A History of Minnesota, 4:60. See also Folwell, A History of Minnesota, 4:77-84.
7 Gray, University of Minnesota, 123. The Mechanic Arts Building is extant and is today known as Eddy Hall.
8 The Bulletin of the University of Minnesota, Institute of Technology, 1936-1937 (Minneapolis: University of Minnesota, 1936), 16.
The evolution of the engineering program in its first fifty years followed national trends in mechanical engineering education. Only a few university engineering programs and technical colleges were founded before the Civil War. Industry was based on the eastern seaboard in small shops where machinists learned the trade through an apprentice system. There was no national demand for machinists or engineers before the war, and although academics and wealthy benefactors tried to start formal schools, most faltered. With the passage of the Morrill Act and the rapid settlement of the western United States after the war, the need for engineers began to grow. Engineering educators at the land-grant universities were creating the American engineering curriculum in the 1870s and 1880s. Many looked to the scientific engineering programs of France and Germany, rather than Great Britain, for education models. The British, like the Americans, were rooted in the apprentice shop system. In comparison, French engineering education was based in the grandes écoles with an emphasis on high-level math and science. The Germans offered multi-level training schools for mechanical engineering, with research institutions at the top. Many American schools integrated theoretical classes with laboratory work that required practical hands-on experience.9

America’s early academic programs were bolstered by an act in 1879 that allowed the president of the United States to detail naval offices from the Naval Engineer Corps to serve as university professors. The act served two purposes—naval engineers who were out of work because of a downsized fleet found employment, and nascent mechanical engineering programs received experienced faculty. Many of these officers resigned their commissions to become full-time educators and early leaders in mechanical-engineering education. The government’s involvement contributed to the debate in the engineering community about the merits of shop versus school training. Industry leaders who had

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risen through the shop system rightfully feared that mass production would force out traditional shops. The debate was settled by industry demand, and the university-educated engineer emerged the winner at the beginning of the twentieth century.  

By that time, the engineering program at the University of Minnesota had matured. The engineers celebrated the new century with a new building located off of the Knoll, south of Pillsbury Hall. The university’s foundry and forge were located in part of the building. In 1901, a building for electrical and experimental engineering was constructed immediately north of the engineering building. The brick-clad, frame buildings housed offices, classrooms, and large, open laboratories ideal for construction and experimentation. Large windows admitted plenty of natural light and aided in ventilation. The new buildings seem to forecast a glowing future for the engineering program.  

The Modern Campus

In 1908, the University of Minnesota held a competition for a campus master plan. Cass Gilbert, a Saint Paul architect who had recently designed the Minnesota State Capitol, had been consulting with the board of regents, and not surprisingly, he won the competition. Gilbert revised his design to better fit the topography of the campus and to integrate ideas developed by landscape architect Warren Manning, another consultant to the university. Gilbert’s plan retained most of the existing buildings around the Knoll on the north side of the campus. On the south section of the campus, including land south of Washington Avenue SE, Gilbert started from scratch. The formal, rectilinear design was oriented around a large mall. Buildings lined the mall’s east and west sides, and the north end was to be anchored by a monumental building. More buildings would edge the city streets that extended from either side of the mall. A campanile would serve as the focal point at the south end of the mall, beyond Washington Avenue. Academic centers were proposed for specific areas of campus. Buildings on the north side, including the Knoll,
would house humanities programs, while technological programs would be concentrated in the new area north of Washington Avenue SE. Buildings dedicated to the medical school were to be built south of Washington Avenue SE.\textsuperscript{12}

Gilbert’s role in shaping the campus ended not long after the plan was put into action. Clarence Johnston, who was the architect for the State Board of Control at the time, designed all of the new buildings, and landscape architects Morrell and Nichols took over the site planning.\textsuperscript{13}

Gilbert’s plan began to take form in the 1910s and 1920s with the construction of Walter Library and buildings for a number of departments in the technological district: Physics, Chemistry, Main Engineering, Electrical Engineering, and Experimental Engineering. The Electrical Engineering Building was completed in 1924 and replaced the smaller 1901 building near the Knoll. The front of the new Electrical Engineering Building faced Church Street SE, with a laboratory wing extending to the east. The front of the building matched the style of the Main Engineering Building, which was directly to the south and also faced Church Street. The electrical engineering laboratory wing, built with “cheaper construction,” was simpler in style and dominated by several bays of large windows.\textsuperscript{14}

While the \textit{Minnesota Alumni Weekly} celebrated the construction of the new Electrical Engineering Building, it lamented the condition of the 1900 Mechanical Engineering Building, which that department had outgrown: “The four shops, namely the pattern shop, the machine shop, the forge and heat treating shop, and the foundry, are now working to capacity, and their limitations, together with the number of available classrooms and drafting rooms . . . produce program conditions which are very difficult to meet.” The mechanical engineering department had the “most urgent need for additional space” of all the departments on campus.\textsuperscript{15}

The university planned to attach a new building for the department to the new Electrical Engineering Building, but the improvement was slow in coming. The problem became even more pressing later in the decade when part of the Mechanical Engineering Building was demolished to accommodate the construction of Northrop Auditorium. The mechanical engineers expanded into the adjacent building formerly occupied by the electrical engineers, and gained some space by

\textsuperscript{12} “The Engineering Campus and Building Program,” \textit{Minnesota Alumni Weekly} 23 (April 17, 1924): 451.
\textsuperscript{13} Ibid.
\textsuperscript{15} “The Engineering Campus and Building Program,” 451-452.
filling in the area between the two buildings, but the addition offered only a temporary respite from growing pains.16

Finally in 1939, mechanical engineering students began a campaign to raise awareness about the deficiencies of their building and call for construction of a new one. The building was considered a bleak eyesore dwarfed by the neighboring Northrop Auditorium. It was too small to accommodate the number of students in the program, which had increased by 150 percent between 1933 and 1938, with more growth expected. In addition, students from other engineering departments also attended mechanical engineering classes in the building as part of their coursework. Reports of problems with the building filled the pages of the Minnesota Daily—the building was too small; the equipment was outdated; graduate programming could not fit in the space; and the building was a fire hazard. Some of these claims were confirmed in 1939 when the state deputy fire marshal condemned the building and recommended it be closed. It remained in use for lack of another alternative. The students’ campaign had raised awareness on campus, but did not convince the state legislature to appropriate money for a new building in its 1939 session.17

In the spring of 1940, the campaign began again. The Minnesota Daily continued to advocate for the new building, and the mechanical engineering department chair lent his voice to the cause. The aeronautical engineers soon joined in, and called for a new building to house both departments.18

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16 Ibid.
The Department of Aeronautical Engineering was created in 1930, although courses were first offered in 1928. John D. Akerman, a pilot and World War I veteran, created and led the program until 1958. Akerman was born in Latvia and studied aerodynamics at the Imperial Technical Institute in Moscow. He served in the Russian Imperial Air Service in World War I, but took asylum in France after the Bolshevik Revolution in 1918. After the war, he emigrated to the United States and attended the University of Michigan. He received his bachelor’s degree in aeronautical engineering in 1925 and completed some courses towards a master’s degree, but left school to work as a chief designer for the Hamilton Metal Plane Company in Milwaukee. In 1928, the Mohawk Aircraft Corporation, located in southeast Minneapolis, hired him to redesign its low-wing monoplane, the “Pinto.” Akerman’s alterations to the plane made it more stable in flight and easier to maintain. Dean Leland of the College of Engineering and Architecture hired Akerman part-time in 1928 to lecture on aircraft design. Akerman continued to work part-time for Mohawk until 1930, when he became a full-time member of the university’s newly formed aeronautical engineering department. The timing was fortuitous: Mohawk went out of business in the following year after not procuring large orders for its aircraft.  

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Enrollment in the aeronautical engineering department increased dramatically during the 1930s, and by 1940, it boasted 549 students, making it the largest department in the Institute of Technology. Aeronautical engineering classes were first held in the Main Engineering building (Lind Hall), but as the program grew, the department needed more space. In 1936, it moved into the north wing of the Armory, which held a basketball court, swimming pool, shower room, and toilet. The basketball court was converted to an airplane laboratory. The swimming pool was drained and partially covered, and the room adapted to house the “airplane design room, airplane motor assembly room, store room, and research laboratory for problems pertaining to the stratosphere.” The shower room and toilet were transformed into the general department offices and private offices for faculty. The Armory also housed the Reserve Officers Training Corps (ROTC) for Army and Navy. By 1940, registration in the aeronautical engineering and ROTC programs had increased so much that the three groups were competing for space within the Armory. The aeronautical engineering program, like the mechanical engineering program, had reached a point where it needed better facilities to ensure its future growth and success.20

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20 “Some Opening Remarks,” 151; Aeronautical Engineering and Its Place and Needs at the University of Minnesota (Minneapolis: Students of the Department of Aeronautical Engineering, University of Minnesota, 1940), n.p.
Together, the mechanical and aeronautical engineering students and alumni raised the level of the building campaign with glossy pamphlets highlighting the value and history of each department and the shortcomings of their buildings. The campaign convinced the board of regents to include the new facility on its list of funding requests for campus improvements during the 1941 legislative session. The odds were against the project, though, because the governor refused to support the expense. During the session, money for the building was almost inserted into a senate bill, but failed to make it at the last minute. The chairs of the mechanical and aeronautical engineering departments vowed to continue their efforts. During the 1943 session, the Mechanical and Aeronautical Engineering Building was the only new facility that the board of regents asked the legislature to fund. This time, the governor supported the request and included it in his budget to the legislature. Still, only a small part of the funding was approved. This was supplemented by additional appropriations during the legislative sessions in 1945 and 1947, and finally in November of the latter year, the university announced plans for the immediate construction of the $2.1 million building.21

The Mechanical and Aeronautical Engineering Building was designed by the firm C. H. Johnston Architects and Engineers, the successor to the practice of Clarence H. Johnston, who had designed most of the buildings along Northrop Mall before 1936. The new

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building completed the Neoclassical facade of the Electrical Engineering Building facing Church Street. Wings extending to the east were more modern and industrial in appearance. Red-brown brick and Bedford limestone on the exterior of the wings visually related the building to the surrounding campus. The building’s structure was fireproof, although it lacked a sprinkler system. The interior plan ranged classrooms, laboratory shops, and offices around central corridors. The interior finishes of classrooms and laboratories were basic, which gave the spaces greater flexibility for use. The changeable layout and other amenities of the new building, including easy access to power sources, followed contemporary guidance for science laboratory buildings. A unique feature of the Minneapolis facility was a small aircraft hangar on the building’s southeast end, a clear-span space that rose two stories and was edged on three sides by a mezzanine. A broad, concrete driveway provided access from Union Street to a tall, folding door on the hangar’s east side.22

The Hagstrom Construction Company of Saint Paul won the bid to be the general contractor for the construction. Langford Electric Company, Minneapolis, and I. J. Donnelly Company, Saint Paul, did the electrical and foundation work, respectively. The building’s construction went smoothly except for a steel shortage in early 1949 and a construction workers’ strike during the summer of that year. The mechanical and aeronautical engineering departments moved in during the fall semester of 1949. Completion of the Mechanical and Aeronautical Engineering Building fulfilled Cass Gilbert’s vision for the engineering section of campus. Demolition of the old mechanical engineering building was completed in November and the area paved over for parking for Northrop Auditorium.23

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The new building was not the only facility of the aeronautical engineering program, which also oversaw the Rosemount Aeronautical Laboratories at the university’s Rosemount Research Center. The center was the former Gopher Ordnance Works, which the university bought for $1 from the War Assets Administration in 1946. A hypersonic “blowdown” tunnel and air heater, a transonic wind tunnel, supersonic wind tunnels, and a jet power plant study section were among the resources available at the Rosemount site until the laboratories were closed in the early 1960s.24

The program gained an important addition to its testing equipment on campus in 1954, when another floor was built on top of the building’s hangar section to house a low-speed wind tunnel. The next major change was administrative, rather than physical: In 1958, the Department of Aeronautical Engineering merged with the Department of Mechanics of Materials to form the Department of Aerospace Engineering and Mechanics. The change was opposed by John Akerman, who felt that it would restrict the aeronautics program, and he was fired as head of the department as a result. It was the end of an important era for the program. His guidance during the program’s early years and his ongoing advocacy had established it one of the leading aeronautical engineering programs in the country. This was belatedly acknowledged in 1980, when the east wing of the Mechanical and Aeronautical Engineering Building was renamed “Akerman Hall” in recognition of his service to the department and the university.25

The mechanical engineering, aerospace engineering, and mechanics programs continue to occupy the building. The mechanical engineering department expanded into the Electrical Engineering Building in the 1990s after the Department of Electrical Engineering moved into a new building on Washington Avenue. The laboratory wing of the old Electrical Engineering Building was torn down, but the section of the building that fronts Church Street and connects to the west wing of the Mechanical and Aeronautical Engineering Building was retained. A new addition was erected on the footprint of the old electrical engineering laboratories in 2000. Lind Hall (Main Engineering) and the Mechanical and Aeronautical Engineering Building are the only original buildings remaining in the row of buildings flanked by Church and Union streets.

EVALUATION OF NATIONAL REGISTER POTENTIAL

The Mechanical and Aeronautical Engineering Building has never been evaluated under the criteria for designation in the National Register of Historic Places. The building was not within the boundaries of a potential Northrop Mall Historic District identified in a 2003 report entitled “Northrop Mall: The City Beautiful Campus Plan of the University of Minnesota.” The report focused on the eligibility of the designed historic landscape of Northrop Mall and the buildings immediately flanking the mall, but the buildings were not evaluated in the report. The report found that the “designed historic landscape component” of Northrop Mall was eligible for listing in the National Register of Historic Places under Criterion C because “the mall is among only a few examples of American campus design fully realized on City Beautiful principles and retains a good level of integrity.”

The area was evaluated again in 2006 and 2008 as part of the cultural resources reviews for draft and final environmental impact statements for the Central Corridor Light Rail Transit Project. During the review of the 2006 report, the Minnesota State Historic Preservation Office (SHPO) and the Minnesota Department of Transportation (Mn/DOT) Cultural Resources Unit confirmed that the district was eligible for the National Register, but requested further study of the district’s boundaries. The 2008 report recommended expanding the district’s boundaries, and this recommendation was approved by the SHPO and Mn/DOT. The Mechanical and Aeronautical Engineering Building is within the revised boundaries.

The Mechanical and Aeronautical Engineering Building will be evaluated below using the National Register criteria described in National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation. To be eligible for listing in the National Register of Historic Places, properties must meet at least one of four criteria:

- **Association value/Event—Criterion A:** Properties that are associated with events that have made a significant contribution to the broad patterns of our history.

- **Association value/Person—Criterion B:** Properties that are associated with the lives of persons significant in our past.

- **Design or Construction value—Criterion C:** Properties that embody the distinctive characteristics of a type period, or method of construction, or that represent the work of a master, or that represent a significant and distinguishable entity whose components may lack individual distinction.

- **Information value—Criterion D:** Properties that have yielded, or may be likely to yield, information important in prehistory or history.

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27 The expanded boundary is delineated in the “Prospect Park and the University of Minnesota” section of the “Supplemental Historic Property Investigation and Evaluation” for the Central Corridor Supplemental Draft Environmental Impact Statement (http://www.metrocouncil.org/transportation/ccorridor/SuppDEISJul08.htm). Confirmation of the district boundaries is in Appendix E of the Central Corridor Final Environmental Impact Statement (http://www.metrocouncil.org/transportation/ccorridor/FEISJuly2009.htm).
In addition, properties must be at least fifty years old unless they are of exceptional importance. Properties listed in the National Register must also retain sufficient integrity to convey their significance. The seven aspects of integrity are location, setting, materials, design, workmanship, feeling, and association.

Areas of Significance

The Mechanical and Aeronautical Engineering Building is eligible for the National Register under Criterion A for its association with mechanical and aeronautical engineering education in the state of Minnesota. The mechanical and aeronautical engineering programs are the leading programs in the state, and are highly ranked nationally. Faculty and graduates of both programs have made important contributions to their respective industries. The departments have occupied the building for the longest periods in their respective histories and are associated more with this building than with any other building on campus.

Period of Significance

The “period of the significance” is the time during which the property achieved its significance. The period of significance for the Mechanical and Aeronautical Engineering Building begins in 1949 when the departments moved into the building and ends in 1960. Although the building is still the home of the original departments, the Secretary of the Interior’s fifty-year guideline has been used to determine the end of the period of significance.

Integrity

An evaluation of integrity must consider the property’s current physical condition in light of its historic evolution. The following section analyzes the Mechanical and Aeronautical Engineering Building using the seven attributes of integrity established by National Register guidelines.

Location—“The place where the historic property was constructed or the place where the historic event occurred.” The building retains integrity of location.

Design—“The combination of elements that create the form, plan, space, structure, and style of a property.” The Mechanical and Aeronautical Engineering Building’s design is intact. The building’s exterior and interior plan are mostly extant and the architect’s original design intent can be seen. The preservation of the interior corridor system and many of the laboratory spaces, down to the original location of machinery, is noteworthy. Additions to the facades have obscured some of the design, but the design retains integrity overall.

Setting—The setting is “the physical environment of a historic property.” The physical environment surrounding the Mechanical and Engineering Building has been somewhat altered from the building’s period of significance. Buildings to south of the Mechanical Engineering Building have been replaced with new structures. Rapson Hall to the north, dates from the end of the period of significance, but Shepherd Laboratories, also to the north, was erected later. The location of the new buildings follow the alignment laid out by Cass Gilbert, but are too new to be
included in a potential Northrop Mall Historic District. The Mechanical and Aeronautical Engineering Building’s integrity of setting has been somewhat compromised, but not enough to make the property ineligible for the National Register.

_Materials_—“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.” The cement plaster and concrete block used throughout the building is intact. Materials like steel pipe handrails, steel-and-glass doors, and steel blast doors have also been maintained. The building’s original wood, double-hung sash windows, steel industrial-sash windows, and metal spandrel panels have been somewhat compromised by lack of maintenance. Overall, though, the Mechanical and Aeronautical Engineering Building retains integrity of materials.

_Workmanship_—“The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.” The workmanship, including the masonry of the exterior and interior, and the plasterwork on the interior, has integrity.

_Feeling_—Feeling is the “property’s expression of the aesthetic or historic sense of a particular period of time.” The Mechanical and Aeronautical Engineering Building retains its feeling of a mid-twentieth century educational building through the integrity of its design, materials, and workmanship.

_Association_—“The direct link between an important historic event or person and a historic property.” The original departments the building was constructed for and named after still occupy the Mechanical and Aeronautical Engineering Building. It retains integrity of association.

**CONCLUSION**

The State Historic Preservation Office has determined that the Mechanical and Aeronautical Engineering Building is eligible for listing in the National Register of Historic Places as a contributing feature of the University of Minnesota Mall Historic District. The building also appears to be individually eligible under Criterion A for its association with mechanical and aeronautical engineering education in the state of Minnesota.
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