



Reeve Memorial Union

Facility Assessment
DSF No. 08127Z.08

November 2011
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Reeve Memorial Union - Facility Assessment
University of Wisconsin-Oshkosh | Oshkosh, WI
Comm. No. 5325

EXECUTIVE SUMMARY

How to use this Report

The report is broken down into multiple sections. Within each section is a brief narrative about the building and any corresponding key notes, deficiencies and recommended remediation for them if applicable. Pictures of any key items are also included for clarification when appropriate.

Summary

The overall goal of this report is to document primarily of the oldest section of the Union. It is intended to document how this portion functions, its visual and functional relationships internally, and with campus.

Sections included in the report are as follows:

1. **Architectural System:** Overall big picture facility overview including spatial relationships, construction materials and condition of those materials.
2. **ADA Compliance:** Assessment of how compliant the facility is with current ADA requirements.
3. **Code Analysis:** Documentation of construction type, occupancy classification and required ratings of walls. The code requirements cover life safety issues with the facility, required fire separations, egress requirements, etc.
4. **Civil:** Documents the exterior site and zoning conditions that may affect future additions. Includes descriptions of all utilities and stormwater management.
5. **Structural System:** Lists any issues with the existing facilities structural system and its capabilities to expand in the future. Call out any deficiencies and recommended remediation steps.
6. **Fire Protection System:** Summarizes existing system and its future capabilities. Recommended upgrades if applicable.
7. **Plumbing System:** Summarizes facilities existing fixtures, water heaters, sewer systems (sanitary and storm), water supply lines. Recommends remediation steps for future and current use. Life expectancy of current equipment/fixtures.
8. **Heating/Ventilating/Air Conditioning (HVAC):** Summarizes the facility's existing systems. Calls out any deficiencies and recommended remediation steps for future and current use. Life expectancy of current equipment/fixtures.
9. **Electrical System:** Lists current equipment and any potential capacity issues. Recommendations for future connectivity. Life expectancy of current equipment.
10. **Appendix:** Building History Plans

REEVE MEMORIAL UNION – ARCHITECTURAL SYSTEM

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History

The Reeve Memorial Union is comprised of three main building portions, constructed over a 43 three year period. Numerous other minor upgrades and maintenance projects through the years also contributed to its present configuration.

The original Union, constructed in 1957, is the western most quarter of the building, and is the focus of this current remodeling work. It has a first floor of 16,742 square feet, a partial basement of 9,172 square feet, and a second floor of 13,618 square feet. There is an additional sun deck that is accessible by door on the second floor, but is not used.

The first large addition to the Union was built in 1963. Parts of it were modified and removed by subsequent work. What remains is approximately 20,600 square feet on first floor; 18,154 square feet plus additional mechanical space on the basement level; and approximately 5,800 square feet on the second floor. The second large addition, which removed the eastern entry of the first addition, almost doubled the size of the facility. Designed in 2000, it added over 34,700 square feet on the first floor, 19,945 on second floor, and an additional 13,094 on a third floor. Due to a difference in floor levels, the basement added only 8,824 square feet, with the rest being unexcavated.

Configuration

The original 1957 building's structure of numerous large columns and poured concrete center stair give it durability and strength, but also pose challenges to its reconfiguration. The center stair is oriented perpendicular to the main corridor, goes up to a landing, then angles back toward the corridor. (See fig. 1) Since the 2nd floor main corridor is at 90 degrees from the 1st floor corridor, traversing the stair has a disorienting effect.

An elevator was a part of the original building, and still functions with much of its original equipment. However, due to security issues with the bookstore, the elevator is not usable to the general public unless they are within the bookstore. Two stairs, one north and one south on the original building provide code required access, but are not usable by building occupants on a normal basis. This leaves only the center stair for vertical circulation in the original building.

The southern third of the 1957 building is unexcavated at the basement level. It houses Union administration offices on 1st floor, and a combination of large meeting rooms and storage on the 2nd floor. Most of this area is not targeted in the current proposed remodeling. A possible exception would be the addition of a family/gender-neutral toilet room between the two existing toilet rooms that open off the main corridor.

The center third of the original building includes its in-set entry, the Credit Union space, center stair, and other circulation space on the main level. The remaining north portion of the 1st floor is occupied by the Student Life Involvement Center (SLIC). The entry sequence and functionality of the SLIC are the primary generators of the current proposed remodeling.

The basement of the original building starts north of the center stair. It houses staff offices, storage, and mechanical spaces. Although mechanically challenging, the spaces on this level could be reconfigured to accommodate needs on the upper floors due to remodeling. Similarly, the 2nd floor has an assortment of meeting rooms, lounges and toilet rooms. As the toilet rooms were targeted for updating regardless of the current project, they may be reconfigured if needed to support the remodeling layout. Keeping the toilet rooms on the same side of the corridor as currently located is advisable for facilitating plumbing and mechanical systems.

Condition and Finishes

The materials and finishes visible to users of the Union range in dates from the original 1957 work to recent remodeling. While maintenance and updated paint colors have kept most of the finishes looking in good condition, there are some notable exceptions, as follows.

- The stair treads on the center stair are a combination of terrazzo and ceramic tile. They are chipped and clearly date from the original construction. See ADA section for comments on hand rails at stairs.

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- There is painted, exposed structure in lieu of lay-in ceiling tiles in several locations. (See figures 2, 3 and 4.) While this can be an acceptable solution, some of the areas of exposed ceiling in the 1957 portions of the building do not look like they were originally intended to be exposed. Electrical conduit and ductwork crowd the ceiling, nail ends from above are exposed, and the structure itself has an unfinished surface texture. With adjacent spaces having lay-in ceilings (See figure 2), the exposed structure appears cluttered and unfinished by comparison.
- Original wood parquet flooring in the large conference rooms on 2nd floor is in good condition with the exception of the area near the doors to the sun deck. There has been water damage to the tiles along the sill of both doors.
- The bathrooms on 2nd floor still have portions of old ceramic tile for former configurations which do not match the rest of the tile. Even the newer ceramic mosaics appear dated. The glazed concrete block in the bathrooms is dated but still a functional surface for maintaining clean walls.
- Many of the original 1957 windows remain in use in the building.
- Many rooms on the second floor, the Algoma Street entry, and the stair shafts, have a 12" x 12" spline ceiling tile which may be from the original construction. This type of ceiling makes access to areas above difficult. There is water damage at the north stair ceiling.

The Algoma Street entrance has its original ceramic mosaic floor tile. Although still in good condition, it does not provide the entry mat and drainage for moisture to accommodate the flow of traffic in winter conditions.

Siting and Expansion

The Union building is accessed by a double stair from the sidewalk level on Algoma Street. See accessibility section for further discussion. A pedestrian walkway from the western part of campus leads directly toward the Union, visually terminating just north of the current entrance.

A limited space for horizontal expansion exists to the west of the current building front, toward Algoma Street and north of the administrative third of the building. See mechanical and electrical trades for discussion of limiting factors along the west side of the building.

City zoning codes call for a 25' setback from Algoma Street. The administrative southern third of the 1957 building is currently at 27.5 feet off the property line.

Exterior Appearance

The original Reeve Memorial Union building is clad in light-toned brick, limestone panels, and a section of ashlar stone at the Algoma Street entry. (See figures 5 and 6.) Most of the current aluminum entry doors and frames are clear anodized aluminum. The exterior frames at the Algoma entrance are dark bronze, with clear anodized doors within them. Roof fascias are clear anodized aluminum color as well.

The 1963 addition continued the light colored brick and clear anodized metal doors and trim. The 2000 addition utilized the anodized metal and light brick, along with a curved metal, standing seam roof and large amounts of glass. (See figures 7 and 8.) Although the two sides of the building use some of the same materials, there is a distinct difference in the look between the western and eastern portions of the building.

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REEVE MEMORIAL UNION – ARCHITECTURAL SYSTEM

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REEVE MEMORIAL UNION – ACCESSIBILITY

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Summary

The original 1957 Reeve Memorial Union was built long before current accessibility standards were in common practice, as was the 1963 addition. Since the 2000 addition to the Reeve Memorial Union was built in the era of ADA compliance, it has not been re-evaluated as a part of this report. Two main areas of concern regarding ADA compliance are entry/accessible route through the building, and accessible facilities.

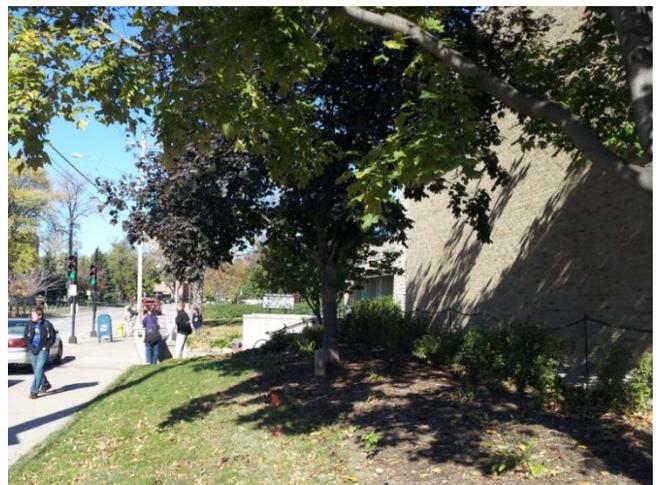
Entry and accessible route

The west entry on Algoma Street is a half of a flight of stairs above the sidewalk grade. It is accessed by a stair that approaches the entry from two directions. (Figure 1) Although there is a section of concrete immediately next to the building that ramps up to the entry, it is not a level surface, has no handrails, and is difficult to keep clear of snow in the winter. (Figure 2) Its location is not readily apparent from the main entry. An accessible entry is available by traveling around the building to the north and entering in a section added as part of the 2000 addition. The Algoma Street entrance does not comply with current accessibility codes and regulations.

On the interior of the building, the elevator in the 1957 portion of the building (discussed in the Architectural section) is only available to the public within the bookstore. When the bookstore is closed, the west half of the building is not accessible from floor to floor. Most door widths appear to comply with the minimum 34" clear dimension required by ADA.



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REEVE MEMORIAL UNION – ACCESSIBILITY

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Bathrooms

All of the toilet rooms in the older parts of the building have undergone remodeling through the years to address changing codes. The second floor women’s toilet room does not have an accessible entrance, as it does not provide required clear floor space at the doors. It does have a stall which appears to be large enough to comply with ADA (Figure 3), and the Women’s room has a 5’ turning radius in the toilet room itself. Fixtures heights vary widely throughout this portion of the building. The second floor men’s room appears to have accessible entry and turning radius within. Although there is a larger size toilet stall, it does not appear to be ADA compliant. Furthermore, the access route to the stall crosses the clear floor space for the urinals. (Figure 4)

The downstairs bathrooms do not have an accessible route of entrance into the room, due to the placement of the wall which blocks vision of the fixtures. Moving the wall would not solve access problems because of the tight configuration of fixtures on or near the far side of the wall. In the Men’s room, the 5’ turning radius overlaps the clear floor space required at the urinals. The urinals do comply with the low and high mounting height requirement.

Current ADA guidelines call for two drinking fountains, one low and one high, both of which need to meet the requirements for clear floor space and approach. The existing drinking fountains do not meet the high requirement. (See figure X)

Service and information counters need to meet the ADA reach ranges and DSF Accessibility Guidelines. This would require a portion of the counters to be at 34” height.



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REEVE MEMORIAL UNION - CODE ANALYSIS

Chapter 3 - Use and Occupancy

Section	Group	Classification
304	B	Business
303.1	A-3	Assembly without fixed seating intended for recreation or other assembly.
See discussion of non-separated occupancies, under 508 below.		

Other occupancies in the building may include the following:

Section	Group	Classification
303.1	A-2	Assembly without fixed seating intended for food and/or drink consumption
311.2	S-1	Moderate-hazard storage
311.3	S-2	Low-hazard storage

Chapter 5 – General Building Heights and Areas

The most recent addition was built under the old Wisconsin Building Code, Chapter 55 Assembly. Adding on to the building will require it to comply with current codes. The occupancy and most probable construction types(See Table 601 information, below) for the existing building are listed in the excerpt from Table 503 below. This is the base value for determining allowable building height and area per floor.

Note: Building separations allow for the building to be viewed as two separate buildings with two separate allowable areas. Although the documents for the 2000 addition seem to indicate a 2 hour separation between old and new, the continuity of that separation needs to be field verified. Without that confirmation, the building is reviewed as one fire area.

		Type I		Type II		Type III	
		A	B	A	B	A	B
Occupancy Group	HGT(feet) HGT(S)	Unlimited	160	65	55	65	55
A-1	S	Unlimited	5	3	2	3	2
	A	Unlimited	Unlimited	15,500	8,500	1,400	8,500
A-2	S	Unlimited	11	3	2	3	2
	A	Unlimited	Unlimited	15,500	9,500	1,400	9,500
A-3	S	Unlimited	11	3	2	3	2
	A	Unlimited	Unlimited	15,500	9,500	1,400	9,500
B	S	Unlimited	11	5	4	5	4
	A	Unlimited	Unlimited	37,500	23,000	28,500	19,000
S-1	S	Unlimited	11	4	3	3	3
	A	Unlimited	48,000	26,000	17,500	26,000	17,500
S-2 ^{b,c}	S	Unlimited	11	5	4	4	4
	A	Unlimited	79,000	39,000	26,000	39,000	26,000

Height = "Stories above grade plane"; Area = "Area building per story"
 UL = Unlimited, NP = Not Permitted

REEVE MEMORIAL UNION - CODE ANALYSIS

- a. See the following sections for general exceptions to Table 503: 504.2, 506.2, 506.3, 507.
- b. For open parking structures, see Section 406.3
- c. For private garages, see Section 406.1

506.2 Frontage increase

The Reeve Union meets the criteria of having minimum of 30' open space on all sides of the building. The calculation which includes both sprinkler increase and frontage increase results in the following potential allowable areas per floor. (This assumes full sprinklering. See 506.3 below.)

Total allowable areas							
		Type I		Type II		Type III	
		A	B	A	B	A	B
Occupancy Group							
A-1		Unlimited	Unlimited	58,125	31,875	52,500	31,875
A-2		Unlimited	Unlimited	58,125	35,625	52,500	35,625
A-3		Unlimited	Unlimited	58,125	35,625	52,500	35,625
B		Unlimited	Unlimited	140,625	86,250	106,875	71,250

*** The current first floor area of the Reeve Union is approximately 72,000 square feet. An addition of approximately 2,000 square feet would bring it to a total of 74,000 square feet. Since other construction types will not provide enough area for an Assembly occupancy building, **Type I-B construction type will be used to review the building.**

Occupancy	Height per Table 503	Increase	Total allowable height
Type I-A	Unlimited	20	Unlimited
Type I-B	160	20	180
Type II-A	65	20	85
Type II-B	55	20	75
Type III-A	65	20	85
Type III-B	55	20	75

508 Mixed Use and Occupancy

Most buildings have a variety of occupancies within. This code section details the ways in which the various rooms need to be separated, or may be unseparated.

REEVE MEMORIAL UNION - CODE ANALYSIS ③

The 2000 addition indicated that the building was an Assembly/Theater occupancy, under the previous Wisconsin Commercial Code. The 2009 IBC would view the building as a combination of Business and A-3 Assembly. If the whole building is designed/reviewed under the more restrictive of those occupancies, then no separation is required between B and A-3 areas. **A-3 is the more restrictive occupancy, thus the building will be categorized as such.**

Table 508.2.5 - Incidental Accessory Occupancies		
Room Description	Rating	Application
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic fire-extinguishing system	Sprinklering will meet the requirement
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic fire-extinguishing system	
Laundry rooms over 100 sf.	1 hour or provide automatic fire-extinguishing system	
Waste and linen collection rooms over 100 sf	1 hour or provide automatic fire-extinguishing system	Sprinklering will meet the requirement
Rooms containing fire pumps in nonhigh-rise buildings	2 hours; or 1 hour and provide automatic sprinkler system throughout the building	

508.3 Nonseparated occupancies.

Buildings that comply with the requirements of this section do not need separation between various occupancies. Requires compliance with the most restrictive occupancy.

See note under 508 above. No separation needed between Assembly and Business occupancies if building is designed under the Assembly criteria. Other occupancies in the building shall be separated per 508.4 below.

508.4 Separation

If creating separate fire areas within a building, reference the following chart for amount of separation required.

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**Table 508.4 (partial listing - only relevant occupancies listed)
Required Separation of Occupancies (hours)**

Occupancy	Ae ,E		F-2, S-2b,c, Ud		Bb, F-1, Mb, S-1		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS
A ^e , E	N	N	N	1	1	2	2	3 _a
I	---	---	1	2	1	2	2	NP
F-2, U _d , S-2 _{b,c}	---	---	N	N	1	2	2	3 _a
B _b , F-1, M _b , S-1	---	---	---	---	N	N	1	2 _a

- S = Buildings equipped throughout with an automatic sprinkler system
- NS = Buildings not equipped throughout with an automatic sprinkler system
- N = No separation requirement.
- NP = Not permitted

- a. For Group H-5 occupancies, see Section 903.2.4.2
- b. Occupancy separation need not be provided for storage areas within Groups B and M if the:
 1. Area is less than 10% of the floor area
 2. Area is equipped with an automatic fire-extinguishing system and is less than 3,000 sf; or
 3. Area is less than 1,000 sf
- c. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour
- d. See section 406.1.4
- e. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

If areas are deemed Hazardous occupancies, they will require a rated separation, regardless of building occupancy.

Chapter 6 – Types of Construction

See notes under Chapter 5 for definitions of construction types.

The documents for the 2000 addition to the Reeve Union indicate a construction type of "Fire Resistive Type B" under the old Wisconsin Commercial Code. This is comparable to Type I-B under the 2009 IBC. If the remainder of the existing Reeve Union cannot be verified to meet **I-B** requirements, it may be reviewed as Type **II-A**. See chart below for ratings of various building components under these construction types.

Refer to IBC 2009 for specific non-combustible materials allowable in Type I & II construction.

REEVE MEMORIAL UNION - CODE ANALYSIS

Table 601 Fire Resistance Rating Requirement for Building Elements (hours)						
Building Element	Type I		Type II		Type III	
	A ^e	B	A ^d	B	A ^e	B
Structural Frame ^a	3 ^a	2 ^a	1	0	1	0
Bearing Walls						
Exterior ^g	3	2	1	0	2	2
Interior	3 ^a	2 ^a	1	0	1	0
Nonbearing walls and partitions	See table 602					
Exterior						
Nonbearing walls and partitions	0	0	0	0	0	0
Interior ^f						
Floor Construction						
Including supporting beams and joists	2	2	1	0	1	0
Roof Construction						
Including supporting beams and joists	1 1/2 ^b	1 ^{b,c}	1 ^{b,c}	0 ^c	1 ^d	0 ^d

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of a roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.

d. An approved automatic sprinkler system in accordance with Section 903.3.1.1. shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1 hour substitution for the fire resistance of exterior walls shall not be permitted.

e. Not less than the fire-resistance rating required by other sections of this code.

f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

g. Not less than the fire-resistance rating as referenced in Section 704.10.

REEVE MEMORIAL UNION - CODE ANALYSIS

Table 602 Fire-Resistance Rating Requirement for Exterior Walls (based on Fire Separation Distance a,e)

Fire Separation Distance = X (feet)	Type of Construction	Occupancy Group H	Occupancy Group F-1, M, S-1	Occupancy Group A, B, E, F-2, I, R, S-2, Ub
X < 5 ^c	All	3	2	1
5 < X < 10	Type IA	3	2	1
	Others	2	1	1
10 < X < 30	Type IA, IB	2	1	1 ^d
	Type IIB, VB	1	0	0
	Others	1	1	1 ^d
X > 30	All	0	0	0

- a. Load bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- b. For special requirements for Group U occupancies see Section 406.1.2.
- c. See Section 706.1.1. for party walls
- d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

Chapter 7 – Fire Resistance-Rated Construction

<p>Definitions: 706 Fire Wall</p> <p>707 Fire Barrier</p> <p>708.2 Shaft Enclosure required</p> <p>708.2 Fire Resistance Rating</p>	<p>Rated construction which allows portions of a structure to be considered separate buildings.</p> <p>Use for separation of vertical exit enclosures, incidental use areas, or to separate different occupancies.</p> <p>Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.</p> <p>Shaft enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. Connected floors include basements but not mezzanines.</p>
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An open stair is allowed between two adjacent floors if it meets the exceptions listed in 708.2.

REEVE MEMORIAL UNION - CODE ANALYSIS

Chapter 10 - Means of Egress

Section 1003 General Means of Egress

- 1003.2 Min. ceiling height: 7'-6".
- 1003.3 Projecting objects or horizontal projections not more than 4" into/over any walking surface.

Handrails may protrude 4.5" from the walls.
 Path of egress travel shall not be interrupted by any building element other than means of egress component.
 Means of egress shall not diminish along path of egress travel.

1004 Occupant Load

Preliminary occupant loads have been determined based on gross areas of departments. The following ratios from Table 1004.1.1 were used.

Type	SF/ Occupant
Assembly	15
Business	100
Mercantile	30
Storage	300

Preliminary occupant load estimate:

Basement	First Floor	Second Floor	Third Floor
544.3 occ.	1548.2 occ.	1157.1 occ.	331.8 occ.

1005.1 Minimum required egress width.

The egress widths required are .3"/occupant for stairways and .2"/occupant for other egress components.
 The building currently meets all egress width requirements.

Section 1007 Accessible Means of Egress

1007.3 Exit stairways

In order to be considered part of an accessible means of egress, exit stairway shall have a **clear width of 48" min.** between handrails and either incorporate **an area of refuge** within the stair enclosure, or be accessed from either an area of refuge or a horizontal exit.

All building stairs currently meet the minimum width requirement.

Exception 1. Area of refuge not required at open exit access or exit stairways as permitted by Sections 1016.1 and 1022.1 in buildings that area fully sprinklered.

The building's existing stairs do not have areas of refuge. This will need to be addressed with the code reviewer in context of the addition and the requirements of the International Existing Building Code when the proposed addition is in design phase. **In either case, it is imperative that the building be fully sprinklered so that many of the existing stairs will be brought into compliance.**

Section 1014.3 Common path of egress travel

For occupancies other than H, common path shall not be more than 75'. In Group A occupancies and assembly occupancies accessory to Group E occupancies having fixed seating, see Section 1028.8.

Exception 1. In Group B, F and S occupancies, common path may be **100'** if the building is sprinklered.

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Partial Table 1016.1.		
Occupancy	without sprinkler system	with sprinkler system
A, E, F-1, I-1, M, R, S-1	200'	250'
B	200'	300'
F-2, S-2, U	300'	400'

Chapter 29 - Plumbing Systems

The number of plumbing fixtures required under current 2009 IBC were calculated for the entire building. Ratios from Table 2902.1 were used to assess fixture quantities. The following is a summary of existing and required fixtures.

	Required Toilets		Lavatories	Drinking Fountains	Other Sinks (Drinking)	Service Sinks
	Men	Women				
Totals	22.47	33.14	27.09	9.80		4
Number Rounded Up:	23	34	28	10		4
Current Plan Amount:	31	32	44	11	3	4

The quantity of Women's toilets and the lavatories includes any unisex fixtures in the building. Even with this inclusion, there is still a deficit of 2 toilets for women in the building as a whole.

REEVE MEMORIAL UNION – CIVIL

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Site Requirements

Expansion of the existing Reeve Memorial Union (RMU) building will take place north of the main entrance on Algoma Boulevard. The parcel is zoned R5-PD and is part of a planned development district within the City of Oshkosh. The existing building face is parallel to the street right-of-way, with a setback of approximately 44 feet north of the existing entrance and 27 feet south of the existing entrance. The City of Oshkosh requires a minimum front yard setback of 25 feet within this zoning district. Any planned encroachment into the 25-foot setback will require a variance. In addition, maximum building height for non-residential buildings in this district is 45 feet. A height variance will be required if the proposed structure expansion exceeds this limit.

A Conditional Use Permit/Planned Development Review submittal and approval will be required from the City of Oshkosh. In addition, a separate City Site Plan submittal and approval from the will be required for this project. The site plan approval also includes review and approval by the City's engineering department. Land disturbance is not anticipated to exceed one acre for the proposed work. As a result, a Notice of Intent for land disturbing construction activity permit from the Wisconsin Department of Natural Resources will likely not be required.

The existing sign located along the front of the RMU will require relocation due to the proposed expansion. Several planter areas with small bushes and shrubs fall within the expansion footprint. There are some larger trees along the loading dock or within the 25 foot setback. Three existing memorial trees are located near the southwest corner of the Union. These trees and their associated dedication plaques must be preserved in place or relocated at the University's direction, if they are impacted by the expansion. Care should be taken for all plantings to remain as indicated by the University during design.

The new entrance will require reconfiguration to meet the Americans with Disabilities Act Accessibility Guidelines. Access to the entrance must be maintained during construction.

Construction of a new residence hall is underway immediately to the south of RMU. Construction for that project is anticipated to be completed in the summer of 2012. Coordination of exterior elements for the RMU renovations will be required once the residence hall facility has been completed.

Utility Analysis**Water Service**

An existing City of Oshkosh water main is located adjacent to the site in Algoma Boulevard. This line consists of 6-inch cast iron pipe running behind the east curb line of Algoma Boulevard. One fire hydrant is located along Algoma Boulevard in front of the RMU. This hydrant is located within the brick paver terrace along the east side of Algoma Boulevard immediately west of the building entrance. In addition, a fire department hose bib connection is located on the building face approximately 40 feet south of the northwest building corner. The existing building service is located between the fire hydrant and fire department connection. The installation year for the water main adjacent to the site is not known. The existing water system has adequate pressure and volume capacity to meet the current demands of the RMU expansion. Fire flow tests in the area indicated Static pressures in the range of 55 psi and residual pressures around 47 psi at approximately 1,140 gpm. Water demand is not anticipated to change as a result of the building renovations. The existing service is anticipated to continue to be adequate to meet the needs of the facility. However, the water service and fire department connection will likely be impacted by the expansion work. These may need to be rerouted or relocated as part of the proposed work.

Sanitary Sewer

An existing City of Oshkosh sanitary sewer system is located adjacent to the project site in Algoma Boulevard. The sanitary sewer is located beneath the northbound lane of Algoma Boulevard. A manhole is located north of the crosswalk where the pipe transitions in size. An 8-inch reinforced concrete pipe approaches the manhole from the south and then a 15-inch reinforced concrete pipe exits the manhole going north. Pipe depths are approximately 16 feet. An 8-inch pipe extends from a manhole on the 15-inch main, going east beneath the loading dock area at an approximate depth of 14 feet, to another manhole in the loading dock. Sewer services extend to Albee Hall and the RMU from the loading dock manhole. The RMU lateral size is 8-inch. It is anticipated that renovations to the RMU will not require additional sewer capacity and that the existing lateral will be sufficient to meet the building needs. In addition, building expansions are not anticipated to impact the location of this service or adjacent sewer lines.

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Storm Sewer

Existing storm sewer within Algoma Boulevard consists of 12-inch and 18-inch reinforced concrete pipe and flows to the northwest. The pipe size change occurs at a manhole north of the crosswalk. This sewer pipe is located along the centerline of Algoma Boulevard at an approximate depth of 5 feet for the 12-inch pipe and 9 feet for the 18-inch pipe. Two curb inlets are located along the north side of Algoma Boulevard in front of the RMU entrance. In addition, an 8-inch storm line extends from a manhole in Algoma Boulevard to a structure located along the front of the RMU just south of the entrance. A 12-inch storm line extends from the main in Algoma Boulevard to a structure behind the sidewalk within the loading dock. Laterals from this line service the Reeve Union. An 18-inch storm line runs under the sidewalk located between the loading dock and Albee Hall and northeast side of the Reeve Union to a structure located at near the of the loading dock. A trench drain along the building within the loading dock discharges to this line via a 6-inch PVC pipe. Renovations to the RMU are not anticipated to generate additional stormwater discharge than what can be accommodated by the current service laterals. No additional service connections are anticipated. In addition, the proposed work is not anticipated to impact existing mains, structures or service lines around the existing facility.

Stormwater Management

The existing site is fully developed with buildings, walkways and other hard surfaces, and green space. According to the Wisconsin Administrative Code ch. NR 151, this site is characterized as a redevelopment. Due to the small size of the disturbed area, it is not anticipated that the site will be required to meet the WDNR Post-Construction Performance Standards (NR 151.12) or City of Oshkosh stormwater management requirements. Implementation of erosion control BMP's will be required for this project by both the City and the WDNR.

Other Utilities

The campus steam line is located along the east right-of-way of Algoma Boulevard adjacent to the project site. Steam vaults are located within University property just south of the entrance to the loading dock as well as at the south edge of the drop-off lane on Algoma Boulevard. The steam service to the building extends from the northern vault. This service will likely be impacted by expansion to the facility and may require relocation during construction.

The existing gas service to RMU enters the site from Algoma Boulevard approximately 50 feet north of the entrance to the facility. The line turns to the north and runs along the building face prior to entering the building at the northwest building corner adjacent to the truck dock. This line will likely be impacted by facility expansion and may require relocation.

Existing power and signal duct banks are located within the University property approximately 10' east of the existing steam line. The building service from these lines is located along the north end of the building adjacent to the loading dock and will likely not be impacted by the proposed work.

Existing campus 16" chilled water supply and return piping extends between Polk Library and Albee Hall to the Reeve Memorial Union (RMU). The piping turns slightly southwest as it approaches the building. The piping enters/exits the facility on the north wall near the rear wall corner behind the receiving dock area. The existing chilled water supply piping system provides 1,150 GPM to the facility. The existing line within the building is 8" and can accommodate up to 1,200 GPM. The renovations to RMU are not expected to increase the chilled water demand for the facility. The existing campus chilled water supply/return system is expected to continue to provide adequate chilled water. The renovation work itself should not impact the existing exterior chilled water piping.

Site Analysis**Site Grading**

The site design for the RMU consists of the new building expansion along with sidewalk and entrance modifications. The existing loading area at the north end of the project site is not anticipated to be impacted by the expansion. The project site slopes moderately with approximately 3 feet of elevation change from the current building face to Algoma Blvd. The exact configuration and orientation of the building expansion is yet to be determined, however, it is expected that the renovations will include modification of the entry to accommodate ADA requirements. Grade transitions via ramps will be needed from first floor to the existing sidewalk elevations. The primary designated pedestrian travel routes and building entrances will generally remain as currently located. Walks

REEVE MEMORIAL UNION – CIVIL

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leading to and surrounding the building need to be sloped at grades at or below 5% and will generally be around 3%.

Any underlying material that cannot support the building foundations or pavement will be removed and replaced with structural fill to subgrade elevation. Groundwater was not encountered during previous geotechnical investigation and should not pose a problem during grading operations.

NOTE: For the purposes of this narrative, it is assumed that Algoma Blvd runs north-south.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Summary

Year/Comm. No.	Original: (1958) Sandstedt and Knoop, Oshkosh, Wisconsin, File No: 5709. Drawings dated: Nov. 1, 1957. Revised Date: Jan. 2, 1958. Building built in vicinity of two existing structures that were removed.
Structural Description	<p>General: First and second floor framing consists of a poured concrete frame structure (floor slabs, beams and columns). Roof framing consists of a steel frame structure with precast deck.</p> <p>Roof: 3" precast concrete roof deck, built-up tar and gravel roof. Open web steel joists ('S' and 'LH' series). Steel beams and columns.</p> <p>2nd Floor: Concrete topping over poured reinforced concrete one-way joist slab system (depth varies: either 8" +2" or 12" +2").</p> <p>1st Floor: Framing same as 2nd floor with the exception of slab on grade occurs where there is no basement. Slab is 5" thick over crushed stone fill (4" min.).</p> <p>Foundation: Poured reinforced concrete spread and wall footings with poured concrete columns and foundation walls respectively. Footings typically extended down 4'-0" below existing grade at time of the building construction. Footings step down at basement location. 4" drain tile around perimeter of basement foundation walls.</p> <p>Exterior walls: Typically 4" face brick headed back every 6th course into 8" lightweight concrete block backup. Reinforced with Dur-O-Wall wall reinforcing every 2nd course. In some locations, there is 4" normal face brick (stack bond) with 6" structural glazed tile back up or 4" cut stone with 8" concrete block backup.</p>
Fire Rating	Unprotected. Not sprinkled. See Code Analysis section, Table 601.
Expandability	Possible horizontal expansion to the West and South.
Height of Building	Approximately 26 ft. at high roof. 23 ft. at low roof.
Typical Bay Size	15 ft. by 23 ft. at North half. 16 ft. by 16 ft. at South half.

Overall Structural Condition

The building appears to be in good to moderate working order and structurally sound, except as noted below. There are some visual defects listed below that can be handled with proper maintenance.

Adequacy for Continued Use

The existing building is satisfactory for continued use and for any future remodeling, except as noted below.

Identified Sufficient and Deficient Aspects (see photos on the following pages)

- Mech. Equip. 204 - Joist bridging was observed to be adequately in place per original drawings (left photo). Cracks in concrete block wall, at north corner, below joist bearing (right photo).
- Storage 205 - Spalled concrete on underside of precast concrete roof deck. Reinforcing is left exposed and could lead to corrosion.
- Storage 205 - Cracks in concrete block wall (high and low) at north corner of room.
- Stair 292 - Cracks in structural glazed tile walls at each lower corner of window frames. According to building maintenance personnel, these cracks occurred as a result of the significant winter condensation on the original building windows. The condensation infiltrates the mortar joints, freezes, and forms enough

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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stress in the tile to produce cracks at the joints. Water stains at ceiling tiles indicate some sort of leak that has taken place.

- Corridor 280 - Cracks in concrete block walls at north and east corners of corridor adjacent to Stair 292.
- Stair 194 - Cracks in concrete block wall northeast of entrance doors. Water stain at ceiling and northwest wall.
- Stair 294 - Cracks in structural glazed tile "center" wall.
- Storage 217A - Hole in precast roof slab. Reinforcing is left exposed and could lead to corrosion. Cracks in concrete block at northeast wall. Cracks in concrete block wall at east corner of room.
- Stair 291 – Top mounting bracket of north handrail is completely loose. This must be capable of supporting a handrail load per State code.
- Telecom 13 - Concrete tread broken off at bottom of stair. Stair railing is not functional.
- Corridor 81 – Cracks at underside of First Level structural slab (adjacent to Mechanical 11).
- Cash Accounting 9A - Cracks at corners of duct penetration through First Level structural slab (left photo). Spalled concrete adjacent to pipe hanger connection (right photo).
- Original Union Roof – Original building roof coverings are in fair to poor condition.
- Original Union Sun Deck – Original building roof coverings are in fair to poor condition. Steel guardrail is showing some signs of corrosion.
- Water stains at Main Entrance soffit, no drip edge provided.
- Algoma Street Elevation - Cracks in face brick along west corner of building. Newer re-tuck pointing was evident, though cracks have re-appeared in face brick.
- Brick Movement was evident, face brick does not align (left photo). Cracks in face brick continue to the southeast toward the sun screen (right photo).
- Cracks in face brick follow course beneath sun screen outlookers (left photo). Significant gap and corrosion was evident at end of steel lintel above window head (right photo).
- Cracks in face brick continue over to opposite corner of building. Cracks in face brick continue east around southeast corner of building.
- Algoma Street Elevation – Significant cracks were evident in stone retaining wall joints.
- Sidewalk settlement was evident adjacent to exterior stair (left photo). Abandoned steel light fixture box is left exposed to the outdoor elements, thus permitting corrosion and deterioration to the box and stone retaining wall (right photo).

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Mech. Equip. 204 - Joist bridging observed to be adequately in place per original drawings (left photo). Cracks in concrete block wall, at north corner, below joist bearing (right photo).



Storage 205 – Spalled concrete on underside of precast concrete roof deck. Reinforcing is left exposed and could lead to corrosion.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Storage 205 - Cracks in concrete block wall (high) at north corner of room.



Storage 205 - Cracks in concrete block wall (low) at north corner of room.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

⑤



Stair 292 - Cracks in structural glazed tile at each lower corner of window frame.



Stair 292 - Water stains at ceiling tiles indicate some sort of leak that has taken place.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Corridor 280 - Cracks in concrete block walls at north and east corners of corridor adjacent to Stair 292.



Stair 194 - Water stain at ceiling and northwest wall.

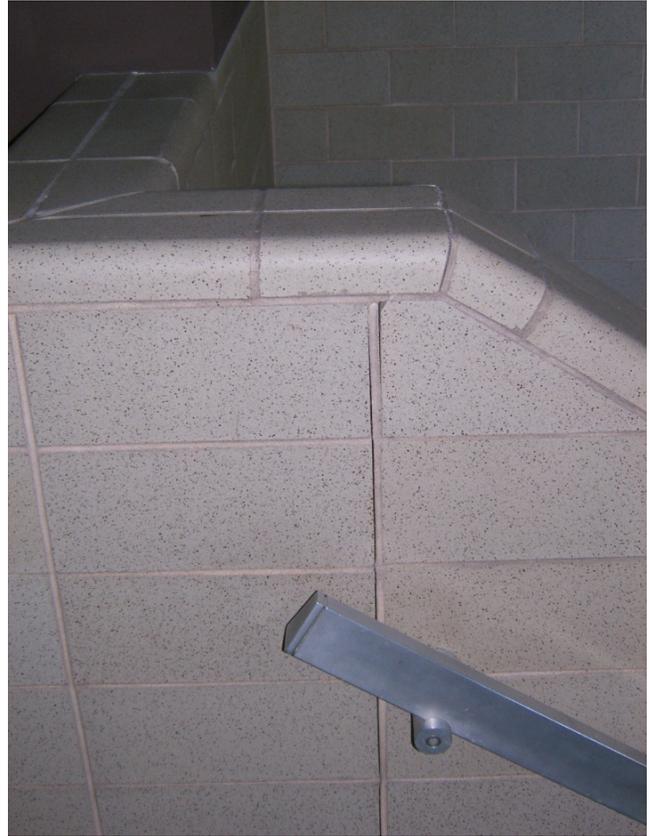


Stair 194 - Cracks in concrete block wall northeast of entrance doors.



REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Stair 294 - Cracks in structural glazed tile "center" wall.



Storage 217A - Hole in precast roof slab. Reinforcing is left exposed and could lead to corrosion.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Storage 217A - Cracks in concrete block at northeast wall.



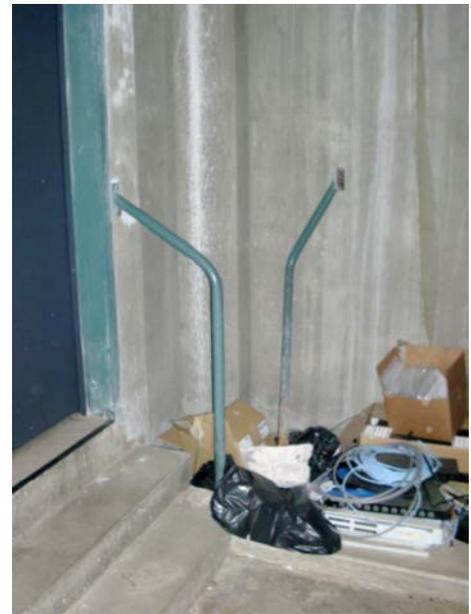
Storage 217A - Cracks in concrete block wall at east corner of room.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Stair 291 - Top mounting bracket of north handrail is completely loose. This must be capable of supporting a handrail load per State code.



Telecom 13 - Concrete tread broken off at bottom of stair. Stair railing is not functional.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Corridor 81 – Cracks at underside of First Level structural slab (adjacent to Mechanical 11).



Cash Accounting 9A - Cracks at corners of duct penetration through First Level structural slab (left photo).
Spalled concrete adjacent to pipe hanger connection (right photo).

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Original Union Roof – Original building roof coverings are in fair to poor condition.



Original Union Sun Deck – Original building roof coverings are in fair to poor condition.
Steel guardrail is showing some signs of corrosion.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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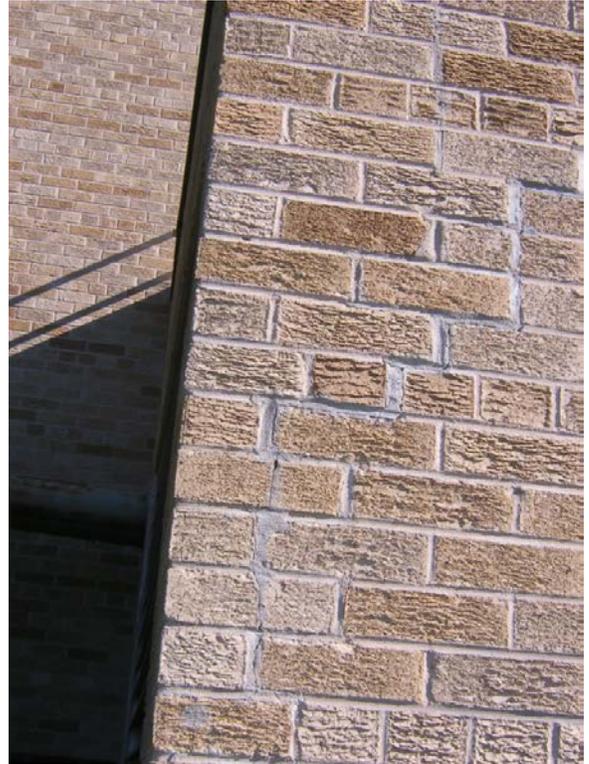
Water stains at Main Entrance soffit, no drip edge provided.



Algoma Street Elevation - Cracks in face brick along at west corner of building.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Newer tuck pointing was evident, though cracks have re-appeared in face brick.



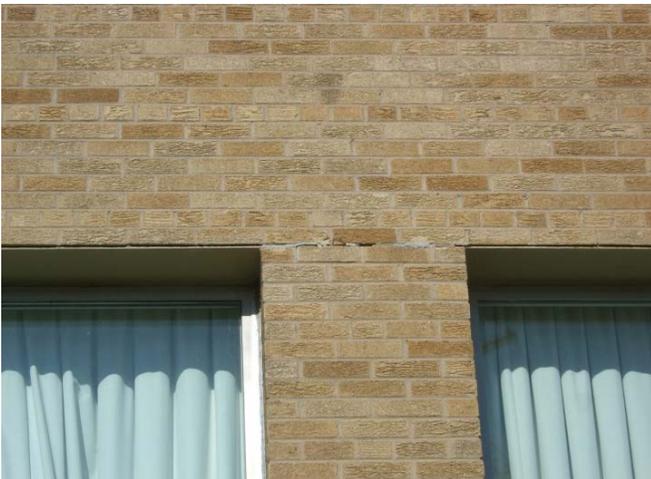
Brick movement was evident, face brick does not align (left photo).
Cracks in face brick continue to the southeast toward the sun screen (right photo).

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Cracks in face brick follow course beneath sun screen outlookers (left photo). Significant gap and corrosion was evident at end of steel lintel above window head (right photo).



Cracks in face brick continue over to opposite corner of building.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Cracks in face brick continue east around southeast corner of building.



Algebra Street Elevation - Significant cracks were evident in stone retaining wall joints.

REEVE MEMORIAL UNION – STRUCTURAL SYSTEM

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Sidewalk settlement was evident adjacent to exterior stair (left photo). Abandoned steel light fixture box is left exposed to the outdoor elements, thus permitting corrosion and deterioration to the box and stone retaining wall (right photo).

Recommendations For Corrective Action (respective to above identified deficiencies)

- Repair spalled concrete from underside of precast roof deck. Apply epoxy coating to all exposed reinforcing prior to making the repair.
- Repair cracks at interior concrete block and structural glazed tile walls. Windows at Stair 292 should be replaced prior to repairing cracks in structural glazed tile walls at each lower corner of window frames.
- Investigate water stains at ceiling tiles to determine the underlining issue first and then take further corrective action as deemed necessary.
- Investigate handrail brackets for improper attachment. Adequately secure them to mounting surface.
- Repair concrete tread and remount stair railing in Telecom 13.
- Repair cracks and spalled concrete at structural slabs.
- Original Union roof and sun deck coverings are at the end of their life expectancy. They are in need of replacement in the very near future.
- Clean, prime, and top coat exterior exposed steel such as window head lintels and guardrails to prevent further corrosion.
- Create drip edge at Main entrance soffit to prevent further moisture problems.
- Repair cracks in face brick by re-tuck pointing brick joints on a yearly maintenance schedule.
- Further investigation of the brick cracks is warranted. From our experience, it may be necessary to construct expansion joints in the exterior masonry walls based on the types of masonry cracks and movement that were evident.
- Repair or replace stone retaining wall as necessary.
- Mud-jack settled sidewalks to align tops with adjacent sections.
- Cover exposed light fixture box in stone retaining wall as a minimum. Otherwise remove light fixture box and infill with exterior rated, non-shrink grout.

REEVE MEMORIAL UNION – FIRE PROTECTION SYSTEM

General

The Reeve Memorial Union consists of 3 building sections. The occupancies include office and meeting spaces, a book store, mechanical spaces and a food court. The original building was built in 1957. The first addition was built in 1963 and the final addition was added in 2001.

The 1957 original building and the 1963 addition are partially sprinkled, while the 2001 addition is fully sprinkled.

Summary

The fire protection system was installed in 2001 by Advantage Fire Sprinkler as a part of the Reeve Union\Blackhawk Commons Remodeling and Addition.

The building is served by a 6" combination domestic water and fire protection main with a 4" Ames 2000SS Double Check Valve Backflow Preventer, which is located in the storage room behind Accounting B04b. This location could be an issue if the building is extended in that direction.

The fire department connection is mounted on a post on the west side of the building, facing Algoma Blvd. If the building is expanded in that direction the fire department connection will need to be relocated.

- Static Pressure 73 psi
- Residual Pressure 65 psi
- Flow was not recorded

The city water pressure is adequate for the fire protection system. Fire protection for the proposed future expansion will be extended from the existing fire protection system and will not require a fire pump to be installed.

The majority of the basement and first floor are adequately protected with sprinkler heads. The area of remodeling will require the sprinkler system on adjacent floors to be reworked. The second floor is partially sprinkled. It is recommended, and may be required, that the remainder of the second floor be sprinkled when the remodeling takes place.

The basement electrical rooms are not sprinkled. This is allowable when the walls are 2 hour fire rated and the rooms are not used for any other storage. Currently these rooms are being used as storage, which requires sprinklers to be added.

Fire Protection System

FIRE PROTECTION	MAIN LEVEL
Fire Pump	N/A
Piping	
Condition	G
Piping Arrangement	G (1)
Sprinkler Heads	
Head Location	D (1)(2)
Head Condition	G

LEGEND

- | | |
|------------------------|--------------------------|
| N New < 5 Years | C Compliant |
| G Good | D Deficient |
| F Fair | NA Not Applicable |
| P Poor | (#) See Remarks |

Notes:

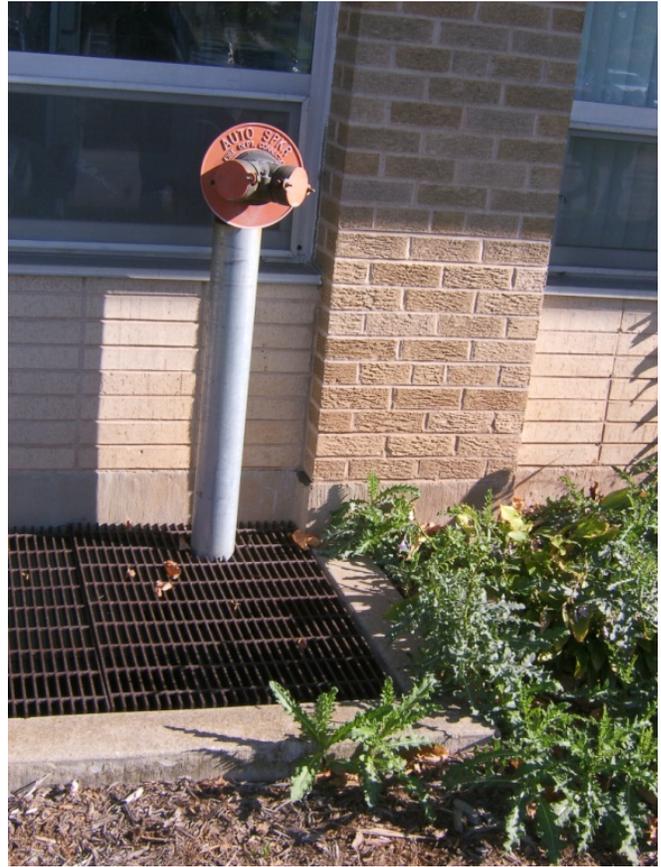
1. Building is not fully sprinkled. System installation and design were done by Advantage Fire Sprinkler.
2. Sprinkler head(s) installed in the office areas, toilet rooms and rooms with acoustical tile ceilings are recessed pendent type. Open areas have exposed piping and upright sprinkler heads.

REEVE MEMORIAL UNION – FIRE PROTECTION SYSTEM

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4" Double Check Valve Assembly



(2) 2 1/2" x 4" Fire Department Connection

REEVE MEMORIAL UNION – PLUMBING SYSTEM ⑦

Summary

The Reeve Union was originally constructed in 1957. There were addition(s) to the building in 1963 and 2001. The 2001 addition also upgraded the exterior utilities, (water, sanitary and storm sewers)

Site Utilities

Building Utilities are fed from Algoma Blvd., south-west of the building.
 There was a new 6" water main installed into the building, in the yr. 2001. Water main is a combination domestic water and fire protection main. Expansion of the building to the southwest will require relocating the 6" water main. Sanitary sewer is a 6" main located west of the building. Exterior grease interceptor is also located in this area. Storm sewer is a 10" sewer on the southeast side of the building, 15" on the northeast side and 18" on the northwest/southwest of building.

Plumbing System

PLUMBING	MAIN LEVEL
Hot Water Generator	G - Note (1)
Piping Condition	G/F - Note (2)
Grease Interceptor	G - Note (3)
Fixtures	G/F - Note (4)

LEGEND

- N New < 5 Years
- G Good
- F Fair
- P Poor
- C Compliant
- D Deficient
- NA** Not Applicable
- (#)** See Remarks

Notes:

1. Hot water steam generator was installed in 2001. Unit is a Cemline Stonesteel heater, in good condition.
 - a. Storage tank is approx. 460 gallon tank, from the 1963 addition project. Hot water recirculation pump(s) are newer, from 2001.
2. Water piping is copper, majority of it is from 2001 addition. Sanitary and storm piping is cast iron.
3. Exterior grease interceptor, 15,000 gallon capacity, installed in 2001.
4. Water closets are wall-hung, lavatories are wall-hung or counter mounted, urinals are floor mounted. Fixtures are in good condition.



Hot Water Steam Generator and Storage Tank



Hot Water Return Recirculation Pump

REEVE MEMORIAL UNION – PLUMBING SYSTEM

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Hot Water Steam Generator



Hot Water Steam Generator

REEVE MEMORIAL UNION – PLUMBING SYSTEM

7



Water Softener

REEVE MEMORIAL UNION – HVAC SYSTEM

8

General

The proposed project for Reeve Memorial Union is focused on the west side entrance and adjacent parts of the building. This area of the building dates back to the original 1957 construction. Over time the HVAC equipment in this area has been replaced and expanded from the original system.

Summary

Currently there are three air units serving second floor that were installed during the Air Conditioning Project of 1986. Two of these units are packaged roof top units and one is a custom air handling unit located in a mechanical room. Basement and first floors are served by a custom air handling unit that was installed with the Remodeling and Addition project of 2000. The current systems are in good working condition, however the three air units serving second floor are getting near the end of their useful life spans, having been run for 25+ years, and lack some of the energy efficient strategies of newer systems.

Building cooling is provided by chilled water cooling coils located in the air units, and a couple of unit ventilators on second floor with chilled water coils. Building heating is provided by hot water reheat coils, finned tube radiation located along perimeter windows, and convectors in stairs and vestibules. Building exhaust needs are served by roof-mounted exhaust fans.

The basement and first floor system (AHU-1) is approximately 11 years old and in good working order. It is a variable air volume (VAV) system with hot water reheat which is consistent with current energy efficient design practices. When installed, the unit was designed with 2,600 CFM of future capacity. Therefore, this system can be remodeled and expanded as needed to serve the new First Floor layout and/or additions proposed. The current system has another 10+ years of life expectancy.

The second floor system is the one in most need of updating. The air units (RTU-1, RTU-2, and AHU-6) are constant volume with high percentages of outside air and pneumatic controls. Additionally there are abandoned switches and possibly other equipment located above the ceiling in the meeting rooms. New air units would be consolidated and installed as one or two VAV systems with a VAV box located in each office or meeting room controlled by occupancy and CO₂ sensors creating a demand controlled ventilation (DCV) system. Using DCV the amount of supply provided to each room can be tailored to the instantaneous need of each room. By monitoring the CO₂ levels in the rooms, the amount of outside air provided can be reduced under normal conditions, and increased when the sensors indicate a need for additional fresh air. These strategies have substantial potential energy savings and benefits to owners. They are recommended if these spaces are remodeled or expanded. The systems would still need to be accompanied by a hot water heating system, such as finned tube radiation at the windows, to pick up the envelope loads during the heating season.

Exhaust systems appear to be running adequately. They will be assessed for replacement based on the extent of remodeling occurring in and around the locations which affect the exhaust systems.

Additional thoughts and concerns related to the expansion of the building to the west include the following:

- Underground steam conduits serving the building
- Exhaust areaway located at grade on the west façade
- Outside air intake for AHU-1 and building gas meter located on the northwest corner of the building
- Expansion to west would need to be carefully coordinated with the steam conduit location and be subject to relocation of the exhaust areaway
- Expansion to the north and west would require relocation of outside air intake for AHU-1 and potential relocation of gas meter

REEVE MEMORIAL UNION – HVAC SYSTEM

HVAC System

HVAC EQUIPMENT	GRADE	COMMENTS	RECOMMENDATION
Air Units			
AHU-1	G	11-yr old VAV unit serving basement/first	Expand unit as needed for remodel/addition
AHU-6	F	25-yr old constant volume unit with 17% OA	Replace with VAV unit using DCV for OA management
RTU-1	F	25-yr old roof top unit serving west meeting rooms on second floor; constant volume system with 42% OA	Replace with VAV unit using DCV for OA management; combine unit with RTU-2
RTU-2	F	25-yr old roof top unit serving second floor offices and lounge; constant volume system with 30% OA	Replace with VAV unit using DCV for OA management; combine unit with RTU-1
Controls	G		Replace pneumatic controls with digital
Ductwork	G	Duct and duct wrap insulation is in good general condition	
Toilet Exhaust Fans	F		If second floor toilets are remodeled, replace exhaust fan
Ductwork	G		

LEGEND

- N New < 5 Years
- G Good
- F Fair
- P Poor
- C Compliant
- D Deficient
- NA Not Applicable
- (#) See Remarks

REEVE MEMORIAL UNION – HVAC SYSTEM

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AHU-6



AHU-1



AHU-1 Intake Louver



West Façade Areaways



Gas Meter

UWO REEVE UNION – ELECTRICAL SYSTEM

Summary

Overall the Electrical service and distribution equipment is code compliant and has capacity for a future addition. The majority of the lighting in the remodel area is fluorescent T8 lamps with electronic ballasts with some incandescent task lighting and down lights. The exit signs are old incandescent and fluorescent type. The data/voice and CATV systems are in fair condition and expandable. The existing Fire Alarm system is in good condition and is expandable. Additional fire alarm speaker/strobes are required in some areas to be code compliant.

Electrical System

ELECTRICAL	GRADE	COMMENTS	RECOMMENDATION
Electrical Normal Power			
Service Entrance Capacity	G	12.47KV Primary from Campus Loop	Existing to remain as is
Substation Condition	G	Fairly new Cutler Hammer Switchboard, 2500 Amp, 480/277 V Main	Utilize existing SWBD to feed new panels as required
Distribution Switchgear Condition	G/F	Some fairly new panels and transformers within the new areas of the building; some older switchboards, panels and transformers which may require upgrades for expansion	Utilize newer equipment as much as feasible for expansion. Some of the older panels have spare breakers which can be utilized to feed new
Branch Panel Condition	G/F	Some fairly new panels within the new areas of the building. Some older panels which may require upgrades for expansion	Utilize newer equipment as much as feasible for expansion. Some of the older panels have spare breakers which can be utilized to feed new
Electrical Emergency Power			
Generator	F	Kohler 60KW, 208V 3 Phase, 4-wire Natural Gas Generator near maximum capacity; not in its' own rated room as required by code	Replace/relocate generator to outdoor location.
Transfer Switches	G/F	One newer switch and one older switch located in Generator room	Needs rewiring if generator is replaced
Branch Panel Condition	G	Branch panels are located in electrical rooms of basement	Expand existing system to feed new emergency egress lighting only

UWO REEVE UNION – ELECTRICAL SYSTEM 9

ELECTRICAL	GRADE	COMMENTS	RECOMMENDATION
Lighting			
Interior Lighting	P	Surface and recessed fixtures with fluorescent T8 lamps and ballasts; some compact fluorescent can lights; some incandescent track lighting	Provide new fixtures within the addition; replace existing fixtures with new within the remodeled areas
Exterior Lighting	P	Minimal canopy HID can lights	Provide new fixtures for the addition
Emergency Lighting/Exit Signs	P	Egress lighting via generator; exit signs are old and obsolete within the remodel areas	Provide new egress lighting per code; utilize existing generator
Communications			
Telephone	G	Telephone Distribution located in MDF and IDFs throughout the building	Expand existing system into the new and remodeled areas
Data	G	Lucent/Systimax Solution located in MDF and IDFs throughout the building	Expand existing system into the new and remodeled areas
CATV	G	Blonder Tongue Solution located in the MDF and IDFs throughout the building	Expand existing system into the new and remodeled areas
Fire Alarm	G	Existing Pyrotronics Fire Alarm System is expandable	Expand existing system into the new and remodeled areas per NFPA 72
Security	G	Existing Andover Access Control System is expandable	Expand existing system into the addition
Sound System (Conference Rooms)	F	Existing systems may be reusable	Turn over to owner agency

LEGEND

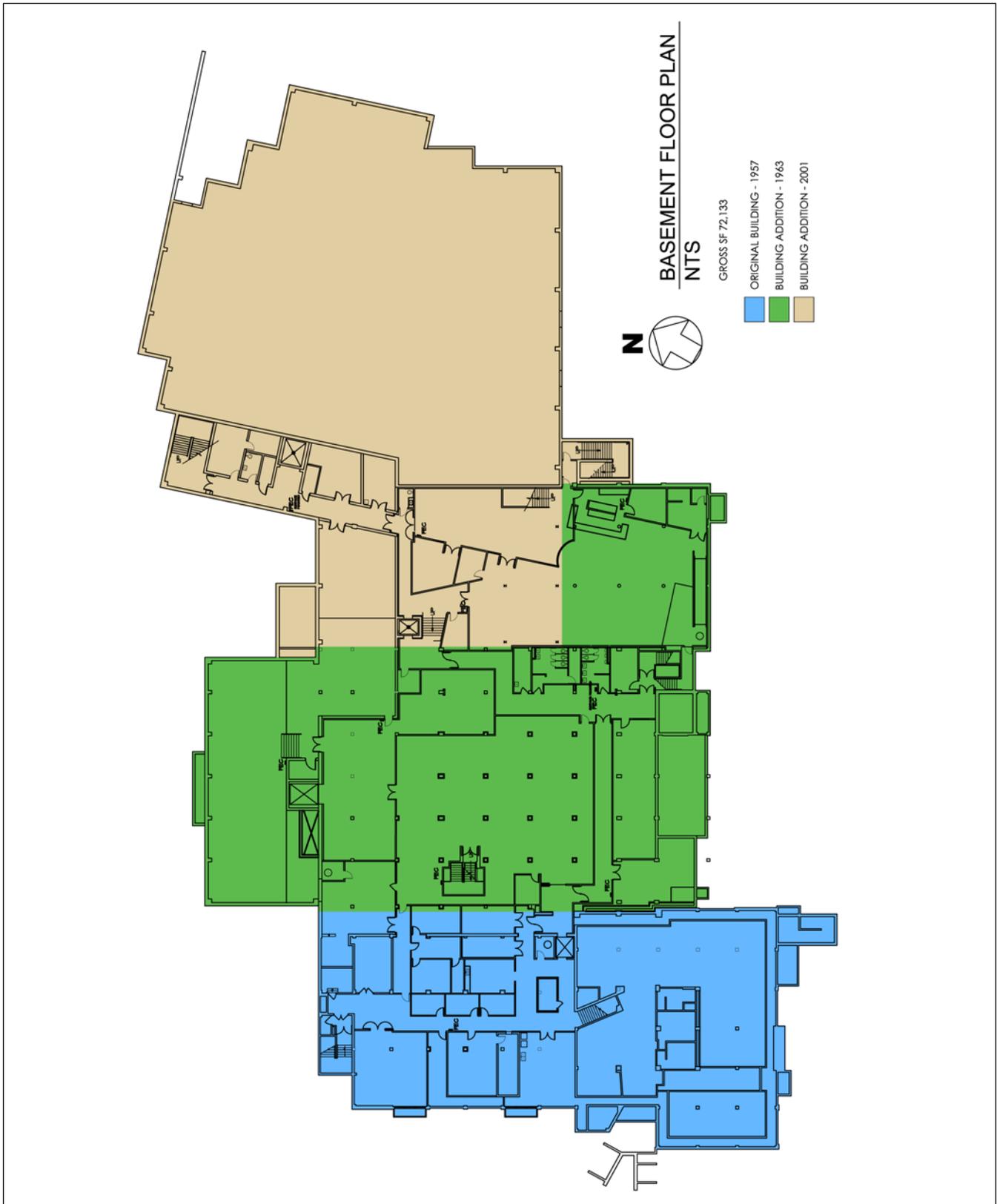
- N New < 5 Years
- G Good
- F Fair
- P Poor
- C Compliant
- D Deficient
- NA Not Applicable
- (#) See Remarks

UWO REEVE UNION – ELECTRICAL SYSTEM ⑨

Equipment Life Cycle Analysis

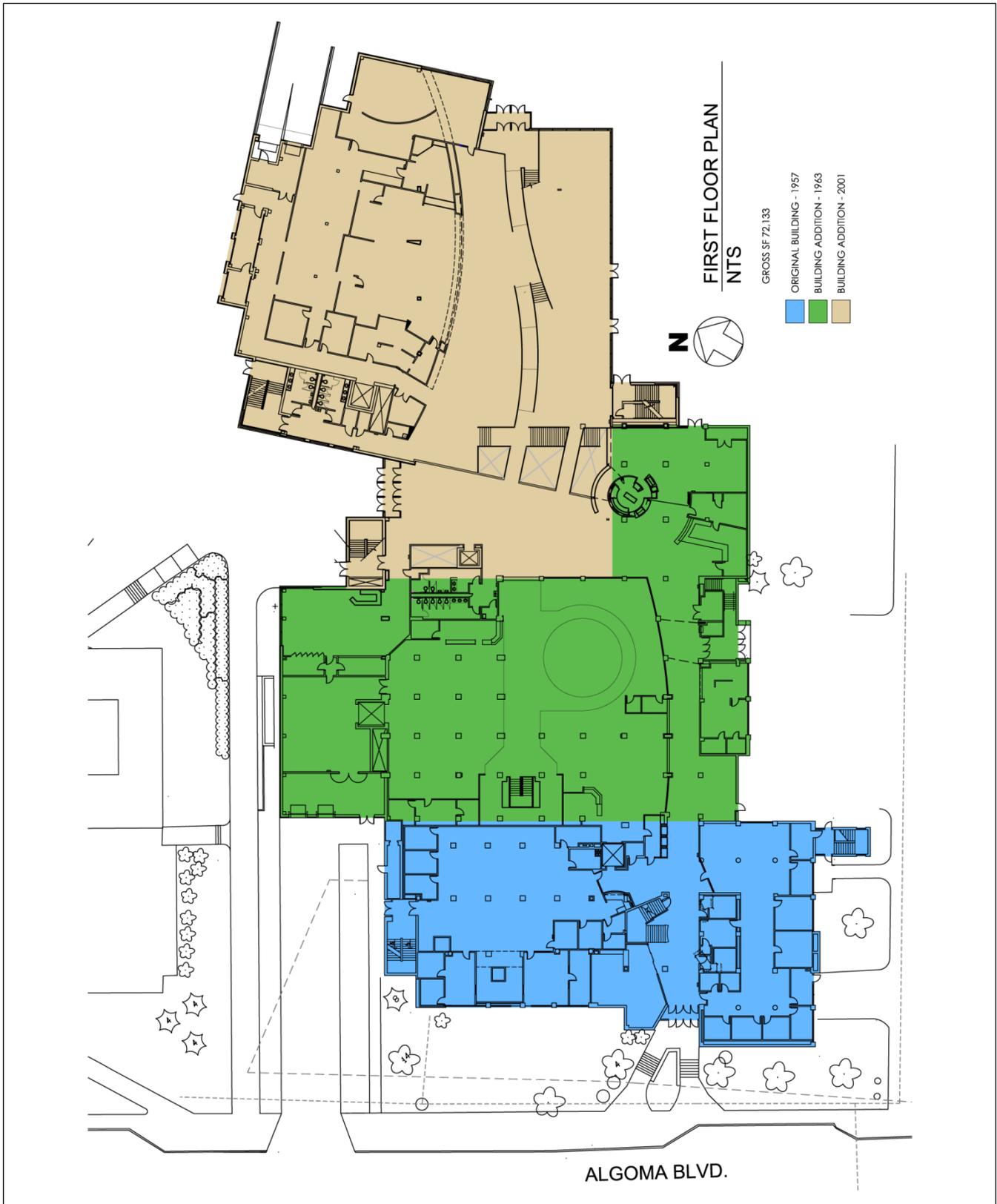
EQUIPMENT TYPE	LIFE CYCLE ANALYSIS
2500A 480/277V MSB SWBD	50 years - Currently at 11 years or less
Old 208/120V MSB SWBD	50 years - Currently at 35 years or more
Panel boards (Newer)	50 years - Currently at 11 years or less
Panelboards (Old)	50 years - Currently at 35 years or more
1600A SWBD	50 years - Currently at 13 years or less
Generator and ATS	30 years - Age of generator and old ATS not identified
Newer ATS	30 years - Currently at 11 years or less
Fire Alarm System	30 years - Age of Fire Alarm System not identified
Security System	25 years - Currently at 11 years or less

Building History Plans - Basement



REEVE MEMORIAL UNION – APPENDIX

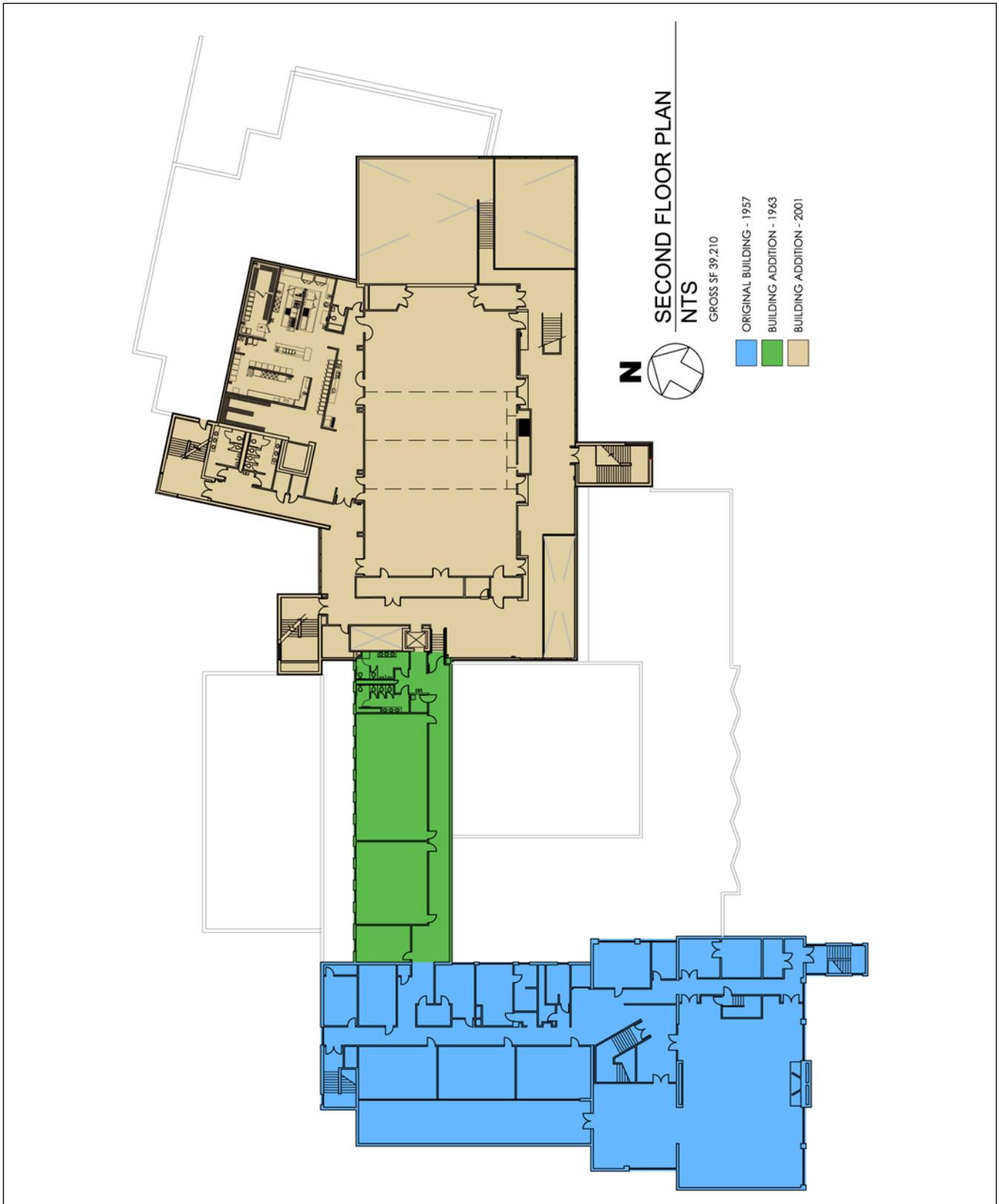
Building History Plans – First Floor



REEVE MEMORIAL UNION – APPENDIX

10

Building History Plans – Second Floor



REEVE MEMORIAL UNION – APPENDIX

Building History Plans – Third Floor

