
OHM Advancing Communities®

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# Franklin Street Sites - Facility Assessment

Hancock MI, 49930

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## EXECUTIVE SUMMARY

This facility assessment report is to identify the condition of the exterior envelope, ADA access, and building systems condition of the three facilities located on Franklin Street in Hancock, Michigan. The focus of this report was on capital improvements without acknowledgment of the future use of the space. The three buildings require varying degrees of upgrades to be operational.

It is expected that all of the buildings will need to be renovated to comply with current Building Code requirements as they have been unoccupied for more than 12 months. This is a requirement regardless of the proposed use of the buildings. A full code review will be required based on the proposed use. It is possible that fire sprinklers and/or fire separations will be required. The masonry construction of the buildings will be an asset if fire separations are necessary.

Two of the buildings, Mannerheim and Nikander, are connected and share an entry point and elevator. Wargelin is a separate facility but shares a heating system with the original Nikander Building.

The exterior envelope of all of them is fair to good condition with the exception of roof repairs/replacement in a couple of areas. Additional recommended work includes re-pointing some masonry areas, window replacements at Nikander, and miscellaneous maintenance including sealant replacement.

All of the buildings will require extensive mechanical updates and depending on the use, fire protection may be required.

An important consideration with the development of these facilities is accessibility both from the exterior and between floors on the interior. The connection point between Nikander and Mannerheim is part of Nikander and would require adjustment to exiting and access from Mannerheim if they are separated. It appears that both would have adequate egress, but that Nikander would lose the accessibility advantage of the elevator from the front elevation of the building. All toilet rooms will need to be updated to meet accessibility requirements. Doors and hardware will need to be updated for accessibility as well.

Exterior site improvements will be required to provide ADA access to the various floors of each of the buildings from the parking areas. These improvements include regarding parking areas for ADA parking stalls, grading sidewalk landings and sidewalk ramps to meet ADA cross slope and running slope requirements, installing ADA parking signs and pavement markings. Parking space is limited within the parcel, the buildings have shared lots with supplemental on-street parking available. To comply with the B-2 Zoning of the parcel it is anticipated a zoning variance will be required to meet the parking requirements.

Select investigations into the condition and connectivity of the existing underground storm and sanitary sewers has determined that spot replacement and repairs will be necessary. Further investigation will be necessary to access the entirety of the systems, along with other site utilities to determine if additional replacement or reconstruction is needed.

# MANNERHEIM

## FINDINGS AND RECOMMENDATIONS

### SITE

The building is zoned as Community Mixed-Use District (B-2). Zoning requirements for off-street parking: 1 space per bedroom for residential and 1 space per 400 square feet (of building) for most other uses. Currently, there are 28 off-street parking spaces. A variance would be possible to include the on-street parking (10 spaces) for the non-residential portion of the building, seeing that the use would be during the daytime.

The site has 2 parking lots located on the west side of the building, accessed from Scott Street. Each parking lot will accommodate 14 cars, totaling 28 off-street parking spaces. There is also space for on-street parking on the north side of Franklin Street, this area would account for 10 on-street parking spaces. One parking space along Franklin Street is striped for ADA; but the slopes of the parking spot and sidewalk to the building do not meet accessibility requirements. There are no current ADA parking spaces or building entrances. Each of the existing parking lots has a 12' wide service drive that leads to the building. The HMA pavement of the parking lots is deteriorating. The existing concrete curb-and-gutter, and sidewalks, though visually aging, appear to be in sound condition.

The two parking lots are graded to sheet flow stormwater onto Scott Street. There are two storm leads that connect to this site. One storm lead runs along the north side of the building. This lead serves storm catch basins (#100005 and #100006) and has leads that run into the north side of the building. There is an in-line cast iron trap (impassable with camera), located in-between the on-site catch basin (#100006) and the City of Hancock main connection on Scott Street. The age of the service lead is approximately 60 years, and the condition is unknown.

The storm system on the south side of the building runs east to west from structure #100001 to #100002 to #100003; structures #100001 and #100002 also have pipes that run north to collect building storm. A second storm connection runs from an on-site junction manhole (#100003) south to a city structure on Franklin Street. There is also a storm line that runs from structure #100003 to #100004; however, the south invert in structure #100003 to the city is the lowest in this structure. The attempt to video this run (#100003 to #100004) hit refusal part way with poor video quality, the camera kept fogging up. Therefore, structure #100004 appears to only collect storm water from a footing drain that apparently taps into this run of pipe, noted from available plans. Structure #100004 has a pipe that runs southwest with in-line cast iron trap prior to the site sanitary sewer tap and ties into the city sanitary sewer on Franklin Street, near Scott Street.

As mentioned above, the sanitary sewer connects to the city system via a tap into the pipe that runs southwest from structure #100004 to a Franklin Street structure, near Scott Street. The sanitary line has a capped cleanout in structure #100004 and #100002. The line also runs through structure #100003, and tee's up in the structure. Video investigation through the tee in structure #100003 hit refusal in both directions. There is standing water and roots penetrating the line. Other access points were attempted for video with no luck accessing the pipe.

There is a 4" domestic water service located near the southeast corner of the building that connects to the water main located along Franklin Street. The service entry looks original to the building, and the condition is unknown.

The building is serviced by a primary underground electrical line from Franklin Street to the south side of the building.

NW Parking Lot

Service Drive on West Side of Building

Service Drive to North Side of Building

**Recommendation:**

It is recommended to remove the in-line trap on the north storm sewer service and further investigate the line to the point it ties in at Scott Street. On the south side of the building, bulkhead and partial replacement of the storm line in-between structures #100003 and #100004 will be necessary to route footing drains into structure #100003. It is also recommended to replace and reroute the deteriorating sanitary sewer lines to ensure proper pipe grade and potential cross contamination within the storm structures. Removing the in-line trap near structure #100004 and utilizing the structure for sanitary sewer would allow better access. Excavation, bulkheading, and new pipe installation will be required.

Reconstruct the asphalt parking lots to gather stormwater runoff and perform select repairs on damaged curb-and-gutter and sidewalk.

Provide ADA parking and access to levels of the building that will be intended to serve as a public entrance.

## BUILDING ENVELOPE

### EXTERIOR WALLS

The majority of the building is faced with brick masonry and EIFS/Stucco. There are some small areas of brick which show efflorescence and some small areas in need of re-pointing. The kitchen addition is the area that has the most concern regarding the condition of the brick. It is apparent that there has been water issues and attention is needed at the scupper locations where there has been a severe degradation of the mortar joints. There is some cracking visible and some joint deterioration in the EIFS/Stucco. The EIFS/Stucco was not the original cladding of the building and the exact construction of the wall system in these areas is unknown.

Insulation in the wall system is unknown but does not appear to be adequate per current standards and code requirements.

Overall, the exterior wall system requires some maintenance but is functional and has over 10 years of life.

**Recommendation:**
Perform maintenance at building exterior, replacing existing sealants. Re-point damaged areas of brick especially at kitchen addition. Install conductors at the scuppers from the kitchen addition roof to avoid further damage to the brick surface.

### ROOF

The roof surface is a fully adhered EPDM membrane. The membrane appears to be adhered well with no visible shrinking. Seams appear to be sealed and flashing/termination strips are in place. Insulation of the roof system is unknown but is expected to be less than current standards and code requirements. Roof drains are present and appear to be functional. Roof drain capacity was not verified.

**Recommendation:**
Have roof contractor inspect the roof regularly and address issues as they arise.

## BUILDING INTERIOR

### INTERIOR WALLS

The majority of the interior partitions are CMU. There are a few areas where brick is exposed on the interior. Several wood framed walls have been added in the lower level.

Recommendations:
Repaint areas as needed. Remove wood framed walls.

### CEILINGS

Ceilings at the wings of the building are exposed, painted waffle slab with some miscellaneous spaces with gypsum board/plaster ceilings. The center of the building includes a mix of suspended acoustic tile, glue-on tile and gypsum board/plaster ceilings.

Recommendations:
Replace damaged/dated acoustic and glue-on tile ceilings and paint other ceiling surfaces as needed.

### EGRESS

The east end of the building shares exiting with the adjacent building. This could present an issue with separate ownership of the two buildings and/or conflicting uses of the two buildings.

Recommendations:
Renovate east end of building to revise exiting or renovate adjacent building to provide clear separation and define an area of shared ownership.

## SAFETY & SECURITY

### FIRE SAFETY

The building does not have a fire sprinkler system. Rated enclosures are present at some stairways and mechanical rooms. There are no other fire separations present in the building. Sprinklers and/or additional fire separations are likely to be required based on future use.

Recommendations:
Provide fire sprinklers throughout the entire building and/or fire separations as required for proposed use.

### SECURITY AND ACCESS

There is no security system present. There is no access control system present.

Recommendations:
Install security systems and access control systems as desired based on future use.

## HAZARDOUS MATERIAL

A hazardous material survey was performed on Mannerheim Hall in May of 2024. The findings of this survey can be found in the "Asbestos Survey & Lead Containing Paints Sampling Report" dated May 30, 2024.

**Recommendation:**
As per the referenced report above, it's recommended that all hazardous materials be removed by a licensed abatement contractor.

## ADA ACCESSIBILITY

The building contains seven levels all separated by stairs. An elevator at the east end of the building provides elevator access to three of the seven levels. The elevator also provides access to the main floor of the adjacent building. Grade access is available at two of the levels which do not have elevator access. Minor modifications to the exterior at these locations would allow for an accessible entrance. Grade access is available at one additional level, but significant modifications to the exterior would be required to achieve an accessible entrance. The one remaining level does not have grade access nor elevator access. See chart below for a list of all levels and their accessibility.

| Level | Access | Notes |
|---|---|---|
| East Wing Basement | Elevator & grade access | Existing exterior ramp to grade access. Reconstruction of sidewalk ramp to meet accessibility requirements. |
| East Wing First Floor | Elevator & grade access in adjacent building | Modifications required to curb/grade to meet accessibility requirements at grade access |
| East Wing Second Floor | Elevator | |
| Center Lower Floor | Grade access | Major modifications required to construct ramp to floor level to meet accessibility requirements at grade access |
| Center Main Floor | Grade access | Modifications required to provide path from accessible parking to meet accessibility requirements at grade access |
| West Wing First Floor | Grade access | Modifications required to curb/grade to meet accessibility requirements at grade access |
| West Wing Second Floor | None | |

There are no accessible toilet rooms in the building.

Approximately half of the building's doors do not meet the current requirements for accessibility clearances. The majority of the hardware appears to be knobs which do not meet current accessibility requirements.

**Recommendation:**
Renovate spaces to accommodate accessible toilet rooms as part of any future renovation. Revise door sizes and locations as required to comply with accessibility requirements. Install ramps and/or modify exterior grade as required to provide accessible entries at all grade access doors. Proposed use of the building may make interior ramps and/or an elevator desirable to reach levels required to be accessible during future renovation. Replace door hardware.

## MECHANICAL

The building's heating system consists of a 2,000 MBH hot water Rite boiler that was installed in 1988. The unit is still in good operating condition but is approaching 40 years of service. The boiler also feeds the Nikander Hall addition hydronic mechanical equipment. The pumps located in the mechanical room are still in good condition. The heating distribution piping is a combination of schedule 40 black pipe and copper pipe. The offices, classrooms, kitchen, and dining hall are heated with convectors and finned tube radiation and about half of them are currently working. The convectors and finned tube are controlled in zones, so each room does not have individual control. Two-unit ventilators provide ventilation air for the kitchen and dining hall but have been taken out and ductwork has been disconnected. All ductwork and diffusers in the kitchen and dining hall have been left in place. A unit ventilator, that is not operational, on the ground floor provided ventilation air to multiple rooms. There is currently no ventilation air being provided to the building. The restrooms have exhaust ductwork connected to powered roof/ceiling exhaust fans that were not operating while onsite.

The compressor for the pneumatic control system looks to be original to the building. The air lines are in place and operational. The compressor has been running continuously during every visit. It seems there may be a leak in the system.

**Recommendation:**
Replace the boiler and pumps. Replace the nonfunctioning convectors and finned tube radiation. Add ventilation to the spaces in the building as required per code. Replace exhaust fans or add energy recovery units for the restrooms. Remove pneumatic control system and replace with a digital control system.

## PLUMBING

### PLUMBING FIXTURES

There are six gang toilet rooms, three men and three women, throughout the building that include lavatories, water closets, urinals, and showers. The ground floor has an additional men's and women's restroom. The first floor has a restroom off the kitchen that includes a lavatory, water closet, and tub/shower. All plumbing fixtures are original to the building and are in poor condition. The water closets are floor mounted with manual flush valves and the lavatories are a combination of manual and sensor faucets. There are two laundry rooms, each with washer hookups and a sink. There are five janitor closets, each have a mop sink.

### PLUMBING SYSTEMS

There are two hot water storage tanks that provide domestic hot water to the lavatories and sinks throughout the building. The domestic water piping is copper, and the sanitary piping is cast iron. There are primary roof drains on the roof but no overflow drains. There is currently no fire suppression system in the building.

**Recommendation:**

Replace all fixtures. Replace roof drains when roof is replaced and add overflow drains. Review the condition of the domestic water and sanitary piping. Replace the hot water storage tanks with storage water heaters. Add fire suppression piping and sprinkler heads to the building.




## ELECTRICAL

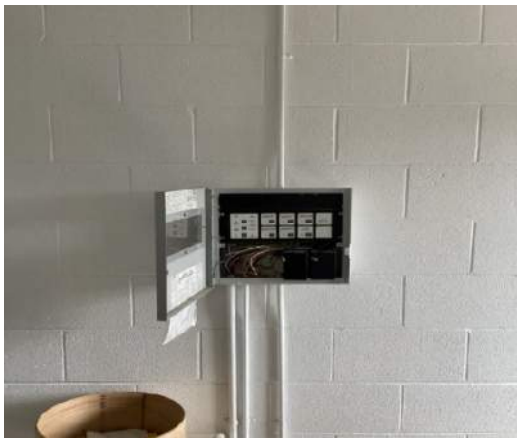
### FIRE ALARM SYSTEM

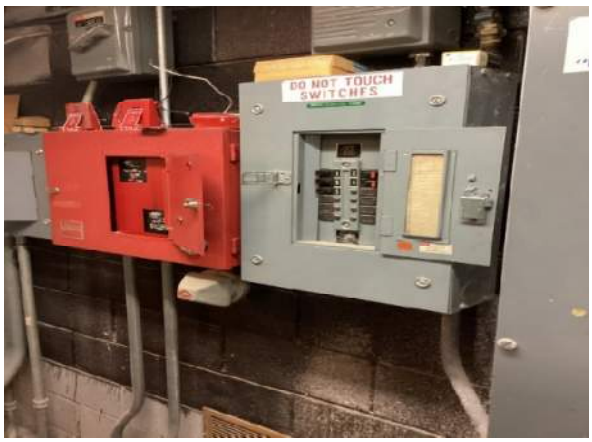
The building contains a fire alarm and detection system. The system consists of pull stations, horns, strobes, bells, flow switch, tamper switch and smoke detectors. Device mounting heights and locations do not meet building codes and regulations. The fire alarm system is past its useful life.

The main fire alarm control panels (FACP) are located in the electrical/mechanical room and in an office located on the first floor east area. The original building fire alarm system control panel is in the basement mechanical/electrical room. The FACP located in the office in the east area is a zoned EST panel. Neither panel was operational at the time of the walk through.

Each dormitory room and the corridors contain standalone battery-operated smoke detectors. None of the devices tested during our walk through where in working order.

**Recommendation:** The fire alarm system is past its useful life. Install a new addressable fire alarm and detection panel, replace input and notification devices, and add devices where needed to bring the system up to current codes.






### EGRESS LIGHTING

The facility does not have a standby generator. Building egress lighting uses incandescent polycarbonate combination emergency exit signs and emergency battery units. Egress lighting does not meet current code in the interior and at the exterior of the building.

**Recommendation:** Replace the interior incandescent emergency lighting fixtures with LED fixtures with battery backup. Add fixtures as need to bring the emergency egress lighting up to current requirements.

**BUILDING SERVICE**

Electrical service consists of a 600A panel board containing a 600A, 208V/120V three phase fusible main service disconnect switch. The panelboard contains two sections feeding multiple panels throughout the building. The panels are fed by 200A, 150A and 100A fused disconnects. The main gear is Federal Pacific brand and original to the building.

Multiple 100A and 200A main lug only federal pacific branch panels are placed throughout the building to feed receptacle and lighting branch circuits. These panels are original to the building.

**Recommendation:** The 600A main service panelboard is close to 60 years old and past its service life. This panelboard should be replaced as replacement parts will not be readily available. The Federal Pacific branch panels are also 60 years old and past service life. This brand in known to cause fires due to the breakers not tripping during overload conditions. Replace all panelboards in original locations with new.

**SITE/EXTERIOR LIGHTING**

There are multiple HID and Led wall packs and canopy lights mounted on the exterior of the building. Most were on during the daylight hours.

**Recommendation:** Replace HID fixtures with new LED fixtures. Replace lighting controls to ensure fixtures will not be on during daylight hours.

### INTERIOR LIGHTING

The interior lighting consists of a mix of fluorescent and incandescent light fixtures. The dormitory room lighting consists of E17 base fluorescent light bulbs in original light fixtures. The hallways consist of tube type fluorescent bulbs in recessed mount 12”x48” fixtures. The cafeteria area contains incandescent recessed can lights throughout.

**Recommendation:** Replace interior lighting in dormitory rooms with LED bulbs and new integral LED light fixtures in the hallways and cafeteria space.

### PUBLIC ADDRESS

There is no public address system in the building.

### CLOCKS

There is no clock system in the building.

### NETWORK SYSTEM

The building has two IT racks with switches, patch panels and an uninterrupted power source UPS. These racks feed data jacks located in each of the individual rooms and wireless access points (WAPS) spread throughout the building. Each IT room includes a cable tray feeding where most of the cables are routed to the IT rack. The switches in the racks are fed by a fiber optic cable. Fiber optic feed originates from Wargelin Hall. A new communication service will need to be installed if the properties are split. Existing IT infrastructure will be useable for a new system.

**Recommendation:** No current recommendations.

### CCTV SYSTEM

Currently, there is one camera pointed at the main entrance facing Summit Street.

### ACCESS CONTROL AND SECURITY SYSTEM

The mail room door is the only door with a modern access control system installed.

# NIKANDER

## FINDINGS AND RECOMMENDATIONS

### SITE

An approximate 21 car parking lot is located on the north side of the site, accessed from Summit Street. This lot provides access to both Wargelin and Nikander buildings. This lot is surrounded by a ~12-foot-wide sidewalk. The cross-slope of the sidewalk is greater than 2.0 percent and the ramp into the parking lot is greater than 8.33 percent, not meeting ADA guidelines. The surface of this parking lot is a mix of concrete and asphalt. This is the same parking lot addressed in the Wargelin building assessment.

This building is zoned as Community Mixed-Use District (B-2). Zoning requirements for off-street parking: 1 space per bedroom for residential and 1 space per 400 square feet (of building) for most other uses. Currently, there are 21 off-street parking spaces, in the shared lot with the Wargelin building.

There is a receiving area, or loading dock, located off the northwest corner of the building. This is accessed by a 12-foot-wide service drive, stemming from the northwest parking lot of the Mannerheim building.

The southeast building entrance is accessed by a staircase from Franklin Street. The southwest building entrance is accessed by stairs and sidewalk ramp from Franklin Street. The sidewalk slopes do not meet current ADA requirements.

An 8” steam line and 1.25” condensate return line run underground to the west and connect into the Mannerheim building.

The sanitary sewer connects to the city system on the south side of the building. Video camera investigation was completed from a clean out in the basement, Franklin Street grade. The sanitary line runs southwest across Franklin Street and ties into manhole E24B on Mine Street. The videoed pipe was in acceptable condition with no standing water. This stretch of pipe also had connecting pipes, but no other video was obtained. A floor cleanout in the garage area was attempted but was too tight for the video camera.

The building storm sewer joins into the Mannerheim Hall system at structure #100002, through structure #100001. Structure #100001 collects storm and sanitary sewer. Video from a vertical pipe cleanout in the garage area weaved under the slab, collecting what seemed to be roof drains, along with wash sink waste, and dumped into structure #100001.


Sidewalk: N Parking lot to Service Drive


SW Building Entrance (Franklin Street)


NE Entrance (Summit Street Parking Lot)

**Recommendation:**

It is recommended to separate the sanitary connections from the roof drains that connect into structure #100001. Structure #100001 should be a storm sewer only structure.

Note that not all pipe was investigated. Looking at the available plans, there is storm or sanitary lines within the building that were not confirmed. The site storm and sanitary sewers should be separated and tied into the city's respective system. A possible solution to this would be to perform dye testing to confirm pipe connectivity to their respective system.

Reconstruct the north parking lot and install measures to control stormwater runoff from the site.

Provide ADA entrances to levels of the building that will be intended to serve as a public entrance. The most feasible entrances for ADA access from a parking spot to the building would be from the north parking lot to the northeast entrance and on-street Franklin parking to the southwest basement entrance. Perform miscellaneous curb-and-gutter and sidewalk repairs.

## BUILDING ENVELOPE

### EXTERIOR WALLS

The majority of the building is faced with brick masonry. There are some small areas of brick which show efflorescence, especially at the east portico, and some visible cracks in need of re-pointing. There is also damage evident at the terrace where a portion of wall was removed.

Insulation in the wall system is unknown but does not appear to be adequate per current standards and code requirements.

Overall, the exterior wall system requires some maintenance but is functional and has over 10 years of life.

**Recommendation:**
Perform maintenance at building exterior, replacing existing sealants. Re-point damaged areas of brick especially at east portico.

### WINDOWS

Most of the windows are single pane metal frame windows which need replacement.

**Recommendation:**
Replace windows.

### ROOF

The roof surface is a fully adhered EPDM membrane. The membrane appears to be adhered well with no visible shrinking. Seams appear to need to be resealed in some areas. Leaks are evident in the building. Flashing/termination strips are in place. Insulation of the roof system is unknown but is expected to be less than current standards and code requirements. Roof drains are present and appear to be functional. Roof drain capacity was not verified.

**Recommendation:**
Have roof contractor inspect the roof to reseal seams. Consider full roof replacement.

## BUILDING INTERIOR

### INTERIOR WALLS

The interior partitions are a mix of painted CMU and painted gypsum board/plaster with some areas of painted concrete and brick.

**Recommendations:**
Repaint wall areas as needed.

### CEILINGS
Ceilings are a mix of painted gypsum board/plaster, exposed structure, and suspended acoustic panels.

**Recommendations:**
Replace damaged/dated acoustic tile ceilings and paint other ceiling surfaces as needed.

### EGRESS
The west end of the building shares exiting with the adjacent building. This could present an issue with separate ownership of the two buildings and/or conflicting uses of the two buildings. An elevator, located in the adjacent building, serves the First Floor.

**Recommendations:**
Renovate west end of building to revise exiting or renovate adjacent building to provide clear separation and define an area of shared ownership.

## SAFETY & SECURITY

### FIRE SAFETY
The building has a partial fire sprinkler system. The most recent construction (connection between original Nikander and Mannerheim) has fire sprinklers. Rated enclosures are present at some stairways and mechanical rooms. There are no other fire separations present in the building. Sprinklers throughout and/or additional fire separations are likely to be required based on future use.

**Recommendations:**
Provide fire sprinklers throughout the entire building and/or fire separations as required for proposed use.

### SECURITY AND ACCESS
There is no security system present. There is no access control system present.

**Recommendations:**
Install security systems and access control systems as desired based on future use.

## HAZARDOUS MATERIAL

A hazardous material survey was performed on Nikander Hall in May of 2024. The findings of this survey can be found in the "Asbestos Survey & Lead Containing Paints Sampling Report" dated May 22, 2024.

**Recommendation:**
As per the referenced report above, it's recommended that all hazardous materials be removed by a licensed abatement contractor.

## ADA ACCESSIBILITY

The building contains five levels all separated by stairs, with a single ramp connecting the First Floor – North with First Floor – South areas. An elevator at the west end of the building (located in the adjacent Mannerheim building) provides elevator access from grade to one level. Additional grade access is available at three other locations on the First Floor. Modifications to the exterior at these locations would allow for an accessible entrance. Grade access is also available at the Third Floor, but

modifications to the exterior would be required to achieve an accessible entrance. The Second Floor does not have grade access nor elevator access. See chart below for a list of all levels and their accessibility.

| Level | Access | Notes |
|---|---|---|
| Basement | Grade access | No access to any other floors |
| First Floor - South | Elevator in Mannerheim & grade access at east and west | Access to elevator may be eliminated depending on use of adjacent building. Modifications required to curb/grade to meet accessibility requirements at grade accesses. Ramp access to First Floor – North |
| First Floor - North | Ramp and stair access from First Floor - South | Some classroom space on this level is only accessible through multiple storage rooms – the path is not compliant. No grade access from this level |
| Second Floor | None | No grade access or wheelchair access to this level. An elevator would be required to reach this level. |
| Third Floor | Grade access | Modifications required to provide path from accessible parking to meet accessibility requirements at grade access |

There are no accessible toilet rooms in the building.

Several of the building's doors do not meet the current requirements for accessibility clearances. There is a mix of levers and knobs for the door operating hardware. Knobs do not meet current accessibility requirements.

**Recommendation:**
Renovate spaces to accommodate accessible toilet rooms as part of any future renovation. Revise door sizes and locations as required to comply with accessibility requirements. Install ramps and/or modify exterior grade as required to provide accessible entries at all grade access doors. Proposed use of the building may make interior ramps and/or an elevator desirable to reach levels required to be accessible during future renovation. Replace door hardware.

## MECHANICAL

The majority of the first floor has an air handling unit (AHU) with duct heating coils that are fed from the hot water boilers in Mannerheim Hall. The pumps are located in the mechanical room in Nikander Hall and some of the hydronic piping requires patching or replacement. The AHU includes heating, cooling, and ventilation and the unit was not in operation during the walkthrough. The cabinet unit heaters and unit ventilators located throughout the building are served by a steam boiler located in the Wargelin Hall boiler room. There is some ductwork and grilles/diffusers on the second and third floor, but it is unknown where the unit is located or if it is operational. Some rooms have wall mounted A/C units. There are grilles in each of the toilet rooms ducted to exhaust fans.

The compressor for the pneumatic control system looks to be original to the building. The air lines are in place, but it is unknown if they are operational.

**Recommendation:**
Verify the age of the AHU's and if they are operational. Verify they are sized appropriately for the spaces and there is adequate ventilation. Add new units and replace existing units as needed to meet ventilation requirements. Remove the steam piping throughout the building and cap the pipes where they come from Wargelin Hall. Remove and replace all convectors. Add boilers and pumps to the mechanical room in Nikander Hall and route new hydronic piping to heating coils and convectors. Remove all pneumatic controls and air lines and replace with a digital control system.

## PLUMBING

### PLUMBING FIXTURES

There is one woman and one men gang toilet room on the first floor, a single men and women toilet room on the third floor, and a single unisex toilet room on the second floor. The toilet rooms include a mixture of floor and wall mounted water closets with manual flush valves, urinals with manual flush valves and lavatories with a mixture of sensor and manual faucets. The

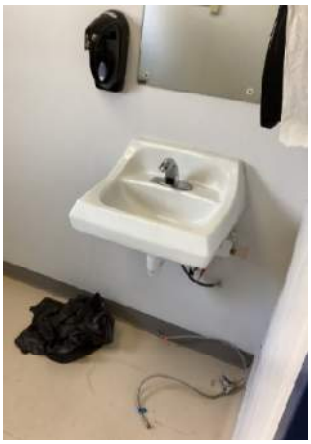
fixtures appear to be in good condition, but the flush valves have been dismantled to avoid freezing during winter. There are no janitor closets.

### PLUMBING SYSTEMS

The main water line and meter are located in the boiler room of Wargelin Hall. The water is routed underground and comes up in the mechanical room of Nikander Hall. There is a water heater in the mechanical room located in Nikander Hall. The domestic water piping is copper, and the sanitary piping is a mixture of cast iron and PVC. There are primary roof drains on the roof but no overflow drains. The shop area in Nikander is sprinklered and the fire suppression line comes from the riser located in Mannerheim Hall. Besides this location there is no fire suppression system in the building.

**Recommendation:**

Fixtures can be salvaged as they are all in good condition. Replace roof drains when roof is replaced and add overflow drains. Review the condition of the domestic water and sanitary piping. Verify the water heater is sized adequately and replace if needed. Add fire suppression piping and sprinkler heads to the building. A separate water main would need to be added with a meter.




## ELECTRICAL

### FIRE ALARM SYSTEM

The building contains a fire alarm and detection system. The system consists of pull stations, horns, strobes, bells, flow switch, tamper switch and smoke detectors. Device mounting heights and locations do not meet building codes and regulations. The fire alarm system is past its useful life.

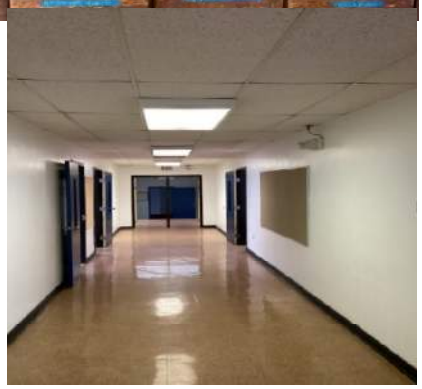
The main fire alarm control panels (FACP) are located in the electrical/mechanical room and in an office in Mannerheim hall located on the first floor in the east area. The original building fire alarm system control panel is located in the basement mechanical/electrical room. The FACP located in the office in the east area on Mannerheim hall is a zoned EST panel. Neither panel was operational at the time of the walk through.

The classrooms in the original building contain standalone battery-operated smoke detectors. None of the devices tested during our walk through where in working order.

**Recommendation:** The fire alarm system is past its useful life. Install a new addressable fire alarm and detection panel, replace input and notification devices, and add devices where needed to bring the system up to current codes.

### EGRESS LIGHTING

The facility does not have a standby generator. Building egress lighting uses incandescent polycarbonate combination emergency exit signs and emergency battery units. Egress lighting does not meet current code in the interior and at the exterior of the building.



**Recommendation:** Replace the interior incandescent emergency lighting fixtures with LED fixtures with battery backup. Add fixtures as needed to bring the emergency egress lighting up to current requirements.

### BUILDING SERVICE

Electrical service consists of a 1600A panel board containing six separate fusible service disconnect switches of varying amperage at 208V/120V three phase feeding the Nikander addition and Mannerheim kitchen. The original electrical gear in the original Nikander basement mechanical/electrical room is served by a separate 400A, 208/120V single phase service disconnect switch.

Multiple 400A main lug only Cutler Hammer panels are placed throughout the Nikander addition to feed receptacles, shop equipment and lighting branch circuits. These panels are original to the addition. The original Nikander building has multiple original branch panels and updated 100A square d panelboards on each floor.

**Recommendation:** The 1600A main service panelboard is in good condition. A single main service disconnect should be added in front of the main service panelboard for added future loads. The original distribution panelboards in the basement mechanical/electrical room will need to be replaced. To separate Mannerheim and Nikander an additional metered service will need to be installed as these buildings are currently on one electrical meter.


**SITE/EXTERIOR LIGHTING**
There are multiple HID and Led wall packs and canopy lights mounted on the exterior of the building. Most were on during the daylight hours.

**Recommendation:** Replace HID fixtures with new LED fixtures. Replace lighting controls to ensure fixtures will not be on during daylight hours.

**INTERIOR LIGHTING**
The interior lighting consists of a mix of fluorescent and incandescent light fixtures. The classrooms and corridors consist of tube type fluorescent bulbs in recessed and surface mount 24”x48” fixtures. The lab and shop areas contain 8’ fluorescent pendant hung strip light fixtures. The stage area and closets consist of incandescent type fixtures.

**Recommendation:** Replace interior lighting new integral LED light fixtures in all spaces.

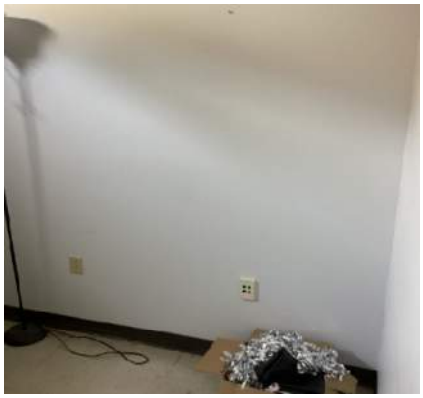
**PUBLIC ADDRESS**
There is no public address system in the building.

**CLOCKS**
There is no clock system in the building.

**NETWORK SYSTEM**

The building has two IT racks with switches, patch panels and an uninterrupted power source UPS. These racks feed data jacks located in most of the individual classrooms and wireless access points (WAPS) spread throughout the building. Each rack includes conduits where most of the cables are routed to the IT rack. The switches in the racks are fed by a fiber optic cable. Fiber optic feed originates from Wargelin Hall. A new communication service will need to be installed if the properties are split. Existing IT infrastructure will be useable for a new system.

**Recommandation:** No curent recommandations.



**VIDEO SURVEILLANCE SYSTEM**

Currently there are multiple cameras in corridors and on the interior side of most exit doors.


**ACCESS CONTROL AND SECURITY SYSTEM**

There is no access control or security system installed.

# WARGELIN

## FINDINGS AND RECOMMENDATIONS

### SITE

There is a small parking area providing access to the southeast building entrance. This area is currently striped for 3 parking spaces. One of the spaces is striped and signed as an ADA space but does not meet the current ADA standards for sidewalk ramp and landing layout. The depth of this lot is 2 feet shorter than the recommended minimum for 90-degree backout parking. The entrance width is also narrower than the recommended minimum for 2-way traffic.

There is 90-degree parking in the northeast corner of the site along the south side of Summit Street. This lot is 18' deep, will accommodate 16 cars, and is 'back-into-street' parking. It is a stand-alone parking lot with no sidewalk leading to any building.

An approximate 21 car parking lot is located on the north side of the site, accessed from Summit Street. This lot provides access to both Wargelin and Nikander buildings. This lot is surrounded by a ~12-foot-wide sidewalk. The cross-slope of the sidewalk is greater than 2.0 percent and the ramp into the parking lot is greater than 8.33 percent, not meeting ADA guidelines. The surface of this parking lot is a mix of concrete and asphalt. This is the same parking lot addressed in the Nikander assessment. The asphalt surfaces in the parking lots are deteriorating and the grades show signs of settlement.

This building is zoned as Community Mixed-Use District (B-2). Zoning requirements for off-street parking: 1 space per bedroom for residential and 1 space per 400 square feet (of building) for most other uses. Currently, there are 21 off-street parking spaces, in the shared lot with Nikander building. There are an additional 19 parking spaces available to the shared 21, for the Wargelin building.

The southwest building entrance is accessed by a staircase from Franklin Street. The 80 feet of chain-link fence that protects the roof of the east addition (Maki Library) has sagged from its original position.

An underground steam line runs north 14' west from the eastern-most northeast corner of the building. An underground gas line runs north from Franklin Street and connects to the east end of the building. Underground electric line connects to the southeast corner of the building from a nearby power pole.

A 10-inch storm sewer line runs northeast from a Franklin Street manhole and connects to a catch basin in the southeast parking lot. This line continues northeast to a beehive cover catch basin which collects water from footing drains and a French drain that wraps around the east side of the building.

It appears there is a 4-inch water service running north into the southeast corner of the building. This line connects to the 6-inch watermain near a hydrant along Franklin Street.

There is a 6-inch sanitary line that runs along the south side of the building. This line has 4" leads into the building. The line then runs south to Franklin Street, but it is unclear on where the line connects to the City's system. A 2009 smoke test shows that roof drains were connected to the building sanitary sewer system. Investigation with video camera was attempted at multiple cleanouts with no success from within and around the building. There is a city sanitary structure (E23A) directly south of the building, on the south side of Franklin Street. This structure does have a pipe going north. Through video investigation, there is what appears to be an in-line trap 8 feet north of the structure (under Franklin Street), which was impassable with the camera.


SE Parking Lot and Entrance (Franklin Street)


Fence Along Roof


Shared Parking Lot with Nikander Building


NW Entrance (Summit Street)

**Recommendation:**

It is recommended to perform further testing and inspection of the sanitary lines to determine the condition of the systems along with connection points. This may include smoke test to confirm the roof drain connections to the sanitary, dye testing, and further video investigation. The site storm and sanitary sewers should be separated and tied into the city's respective system.

Repair the chain-link fence, miscellaneous curb-and-gutter, and sidewalk flags that have settled and broken.

Reconstruct the north parking lot and install measures to control stormwater runoff from the site. Resurface the 16-car and 3-car parking lots. Construct a sidewalk from the 16-car parking lot to the northwest entrance.

Provide ADA entrances to levels of the building that will be intended to serve as a public entrance. The most feasible entrances for ADA access from a parking spot to the building would be from the north parking lot to the northwest entrance and the 3-

car parking lot to the southeast entrance.

## BUILDING ENVELOPE

### EXTERIOR WALLS



The majority of the building is faced with brick masonry in good condition. There are some small areas of brick which show efflorescence especially at the exterior retaining walls on the south side. The concrete caps on the retaining walls have open joints. There are a few small areas of damaged brick including at the southeast corner of the boiler room and on the west side at the terrace where a wall was removed. A few cracks are visible at the exterior. Additional cracks are visible at the interior of the building in the exterior CMU walls. Areas of particular note are the exterior wall of the Physics/Chemistry room on the second floor, classrooms in the Northeast corner of the first floor and the Women's bathroom on the third floor.

Metal fascia panels are present around the building exterior and appear to be in good condition.

Windows are aluminum and include insulated metal panels within the framing system.

Insulation in the wall system does not meet current Code requirements. There does not appear to be any insulation in the solid masonry walls of the original (1965) building. A cavity wall provides insulation in the addition (1996) but the quantity of insulation while satisfactory does not meet current standards.

Overall, the exterior wall system requires some maintenance but is functional and has over 10 years of life.

**Recommendation:**
Re-point concrete caps at exterior retaining walls. Repair damaged masonry wall as required. Perform maintenance at building exterior, replacing existing sealants. Further investigation by a structural engineer should be performed to determine if there are underlying structural issues causing the cracking.

### ROOF

The majority of the roof surface is a loose laid EPDM membrane with rock ballast. The membrane shows some possible shrinking at the roof edges. Seams are not visible due to the ballast. Water marks inside the building indicate that there may be leaking in areas. Insulation of the roof system over the addition (1996) is 4" of rigid insulation which was standard for that time but may not meet current Code requirements. Insulation of the roof system over the original building was originally indicated to be 1" rigid insulation. It is unknown if additional insulation was added later, but it is expected that current insulation is less than current standards and code requirements. Roof drains are present and appear to be functional. Roof drain capacity was not verified.

A section of roof above the boiler room is an asphalt built-up roof. This area is in poor condition and leaking is evident at the interior.

**Recommendation:**
Replacement of the entire roof system is recommended. A fully adhered membrane system is recommended (remove all existing ballast). Additional insulation could be added during roof replacement.

## BUILDING INTERIOR

### INTERIOR WALLS

Interior walls are a mixture of painted CMU and painted gypsum board surfaces.

**Recommendations:**
Repaint areas as needed. Cracks should be re-pointed/patched prior to painting.

### CEILINGS

Ceilings throughout the building are a mixture of Suspended Acoustic Panels and painted gypsum board.

**Recommendations:**
Replace damaged/dated acoustic tile ceilings and paint other ceiling surfaces as needed.

### EGRESS

The first floor has three exits at grade. The second floor has no current exits at grade. A former exit that was at terrace level in the courtyard has been permanently blocked. The third level has an exit at grade as well as an emergency exit from the lecture room which exits onto a cantilevered walkway and leads to steps to grade. This door is difficult to open, and the cantilevered structure shows considerable deterioration with spalling concrete and reinforcing visible.

**Recommendations:**
Repair cantilevered walkway at lecture room exit and maintain/replace exterior doors as necessary.

## SAFETY & SECURITY

### FIRE SAFETY

The building does not have a fire sprinkler system. Rated enclosures are present at some stairways and mechanical rooms. There are no other fire separations present in the building. Sprinklers and/or additional fire separations are likely to be required based on future use.

**Recommendations:**
Provide fire sprinklers throughout the entire building and/or fire separations as required for proposed use.

### SECURITY AND ACCESS

There is no security system present. There is no access control system present.

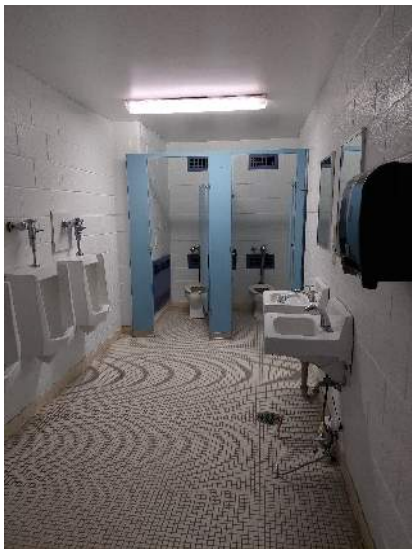
**Recommendations:**
Install security systems and access control systems as desired based on future use.

## HAZARDOUS MATERIAL

An environmental site assessment was performed on Wargelin Hall in July of 2023. The findings of this assessment can be found in the "Phase I Environmental Site Assessment" dated July 13, 2023.

**Recommendation:**
As per the referenced report above, it's recommended that all hazardous materials be removed by a licensed abatement contractor.

## ADA ACCESSIBILITY



The building contains four levels with stair access to all levels. There is no elevator in the building. Grade access is available at the first floor and the third floor. These accesses appear to largely comply with accessibility requirements and only minor modifications may be needed to provide accessible entries at the first and third floor. There is only stair access to the second floor, there is no path for a wheelchair to access this floor. There is also only stair access to the boiler room level.

Toilet rooms on the first floor appear to comply with most accessibility requirements, minor modifications may be required to bring them up to current requirements. Toilet rooms on the second and third floor do not comply with requirements.

Most of the building's doors appear to meet the current requirements for accessibility clearances. The majority of the hardware on the second and third floors appears to be knobs which do not meet current accessibility requirements.

**Recommendation:**
Modify first floor toilet rooms to comply with current accessibility standards. Renovate spaces on the second and third floor to accommodate accessible toilet rooms as part of any future renovation. Install ramps and/or modify exterior grade as required to provide accessible entries at all grade access doors. Proposed use of the building may make an elevator desirable to reach levels required to be accessible during future renovation. Replace door hardware as necessary. Consider adding exterior grade level entrance to boiler room.

## MECHANICAL

The building's heating system consists of three steam boilers that are original to the building. The boilers feed induction units, convectors, unit ventilators, and finned tube radiation throughout the building. The boilers also feed mechanical steam equipment in the Paavo Nurmi building and the existing Nikander Hall (not including the addition). The restrooms and janitors' closets have ducted exhaust fans located on the roof. The stairways and entry ways are served by cabinet unit heaters with steam piping. The gas meter is located outside the boiler room and comes into the building with a 2" and 1-1/2" pipe.

The compressor for the pneumatic control system looks to be original to the building. The air lines are in place, and it is unknown if they are operational.

The first-floor rooms including the library are served by induction units with steam piping and outside air ductwork runs in the tunnels below. The outside air is provided by an air handling unit (AHU) with a steam heating coil and DX cooling coil with a roof mounted condensing unit. It was installed in 1996 and is located in the mechanical room on the second floor. It is unknown on whether the unit is operational or not. There is a ceiling return plenum that has return grilles in the space and a relief hood located on the roof. The addition to the library built in 1996 is served by an AHU with supply and return ductwork and is located in the penthouse. The unit currently does not work. The AHU has a hydronic heating coil and DX cooling coil with a roof mounted condenser. A heat exchanger is installed in the boiler room to convert the steam to hot water. The hydronic piping is copper. There is a gravity relief vent located on the roof with a grille in the ceiling for the relief air. The perimeter of the library addition has hydronic finned tube radiation. The units are not operational and most of the piping needs to be replaced.

The second floor classrooms are served by induction units with steam piping and outside air ductwork ran in the first floor ceiling. The outside air is provided by the same AHU as the first floor units. There are ceiling grilles in multiple rooms that are ducted to transfer grilles in the walls between the room and the corridor ceiling. There is an exhaust fan located on the roof that is ducted into the corridor ceiling. Rooms without transfer grilles have their own ceiling grille ducted to an exhaust fan.

The lecture room on the third floor is served by two floor mounted unit ventilators with louvers for outside air and a steam heating coil. There is a return grille that is ducted to an exhaust fan on the roof and steam convectors for additional heating. The offices on the third floor are served with steam convectors and have no ventilation.

**Recommendation:**
Replace the steam boilers with hydronic boilers. Replace the pumps and remove all steam pipe or abandon in place as needed. Cap the steam pipe in the locations that it runs underground to Paavo Nurmi and Nikander Hall. Remove the induction units, ductwork, piping, and the air handling units providing outside air to the induction units. Remove the gravity relief hoods, ductwork, and return grilles in the ceilings. Replace the AHU in the penthouse and condenser serving the addition to the library and add an AHU with heating and cooling to serve the existing library area. Add a roof mounted AHU with heating and cooling to serve the second and third floor. Route hydronic piping from the boilers to the AHU heating coils and to new convectors and finned tube radiation as needed for additional heat. Replace the exhaust fans for the restrooms and janitor

closets. Remove all cabinet unit heaters with steam piping and replace with new cabinet unit heaters with hydronic piping. Remove all pneumatic controls and air lines and replace with a digital control system.






## PLUMBING

### PLUMBING FIXTURES

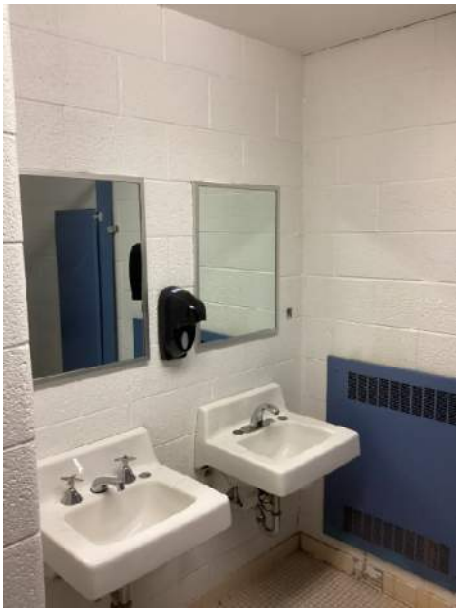
There are six gang toilet rooms, three men and three women, throughout the building. These toilet rooms include water closets, lavatories, and urinals. The floor mounted water closets and wall mounted urinals have manual flush valves, and the lavatories are a mixture of sensor and manual faucets. Some of the water closets look to have been replaced but most are old. The urinals, lavatories and faucets all look to be in good condition. There are three janitor closets, one on each floor, each with a mop sink and faucet.

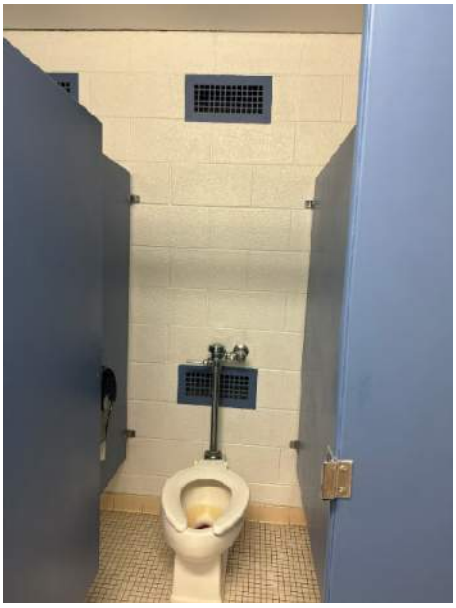
### PLUMBING SYSTEMS

The domestic water comes into the building in the boiler room. After the meter, a pipe comes off the main and goes underground to Nikander Hall. There is an electric water heater in the boiler room that provides domestic hot water to the lavatories and sink throughout the building. The domestic water piping is copper, and the sanitary piping is cast iron. There are primary roof drains on the roof but no overflow drains. There is currently no fire suppression system in the building.

**Recommendation:**

Replace all fixtures. Replace roof drains when roof is replaced and add overflow drains. Review the condition of the domestic water and sanitary piping. Replace the electric water heater with a gas water heater. Add fire suppression piping and sprinkler heads to the building.





## ELECTRICAL

### FIRE ALARM SYSTEM

The building contains a fire alarm and detection system. The system consists of pull stations, horns, strobes, and smoke detectors. Device mounting heights and locations do not meet current building codes and regulations. The fire alarm system is past its useful life.

The main fire alarm control panels (FACP) are located in the boiler room and in the library work room. The original building fire alarm system control panel is located in the basement boiler room. The FACP located in the library work room is a zoned EST panel. Neither panel was operational at the time of the walk through.

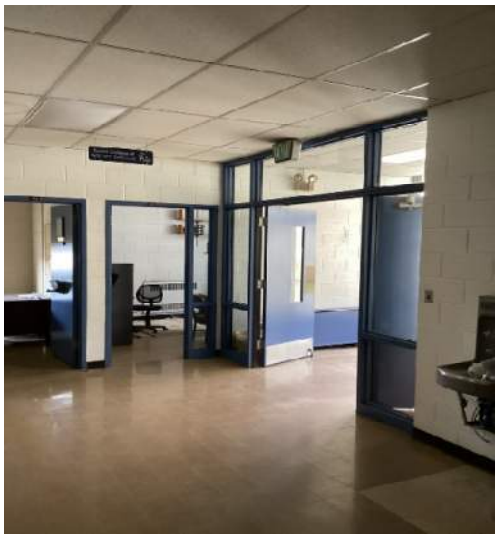
The classrooms and office spaces in the original building contain standalone battery-operated smoke detectors. None of the devices tested during our walk through where in working order.

**Recommendation:** Install a new addressable fire alarm and detection panel, replace input and notification devices, and add devices where needed to bring the system up to current codes.


### EGRESS LIGHTING

The facility does not have a standby generator. Building egress lighting uses incandescent polycarbonate combination emergency exit signs and emergency battery units. Egress lighting does not meet current code in the interior and at the exterior of the building.

**Recommendation:** Replace the interior incandescent emergency lighting fixtures with LED fixtures with battery backup. Add fixtures as need to bring the emergency egress lighting up to current requirements.




**BUILDING SERVICE**

Electrical service consists of a 400A panel board containing a 400A, 208V/120V three phase fusible main service disconnect switch. The panelboard contains one section feeding multiple panels throughout the building. The panels are fed by 100A and 60A fused disconnects. The main gear is Westinghouse brand and original to the building.

Multiple 225A and 100A main lug only Westinghouse branch panels are placed throughout the building to feed receptacle and lighting branch circuits. These panels are original to the building. Multiple 225A and 125A GE panels were added in the late 1990's to feed an addition to the library.

**Recommendation:** The 400A main service panelboard is close to 60 years old and past its service life. This panelboard should be replaced as replacement parts will not be readily available. The Westinghouse branch panels are also 60 years old and past service life. Replace these panelboards in original locations with new. The GE panelboards are in good condition and can remain.


### SITE/EXTERIOR LIGHTING

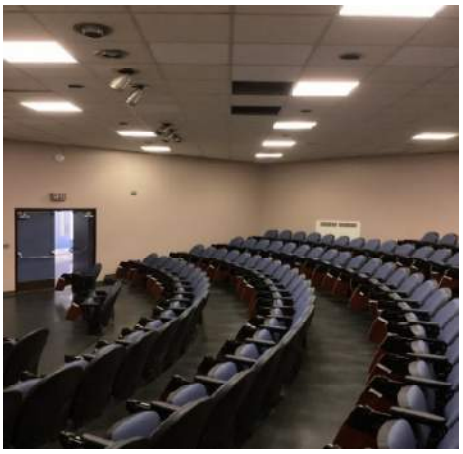
There are multiple HID wall packs and canopy lights mounted on the exterior of the building. Most were on during the daylight hours.

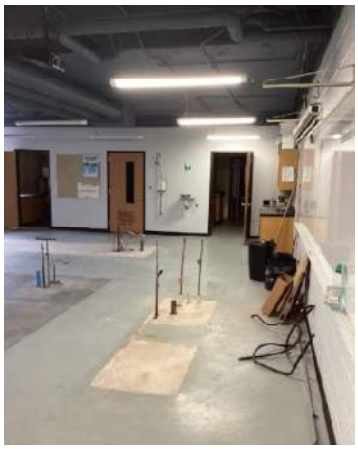
**Recommendation:** Replace HID fixtures with new LED fixtures. Replace lighting controls to ensure fixtures will not be on during daylight hours.

### INTERIOR LIGHTING

The interior lighting consists of a mix of LED, fluorescent and incandescent light fixtures. The chemistry lab contains newer led pendant light fixtures. All other classrooms, the library, offices and corridors consist of tube type fluorescent bulbs in recessed 24”x48” fixtures. The lecture hall contains 2’x2’ fluorescent fixtures, incandescent recessed can lights and incandescent spotlights.

**Recommendation:** Replace interior lighting new integral LED light fixtures in all spaces.





### PUBLIC ADDRESS

There is no public address system in the building.

### CLOCKS

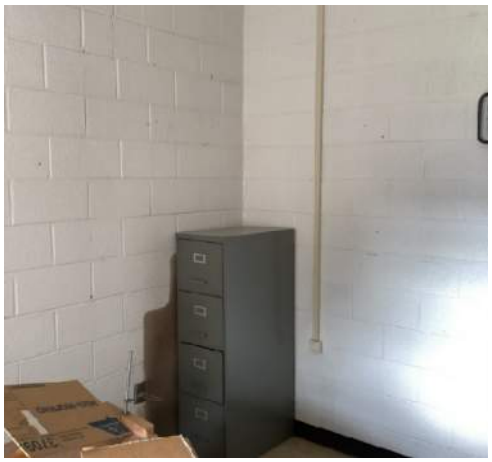
There is no clock system in the building.

### NETWORK SYSTEM

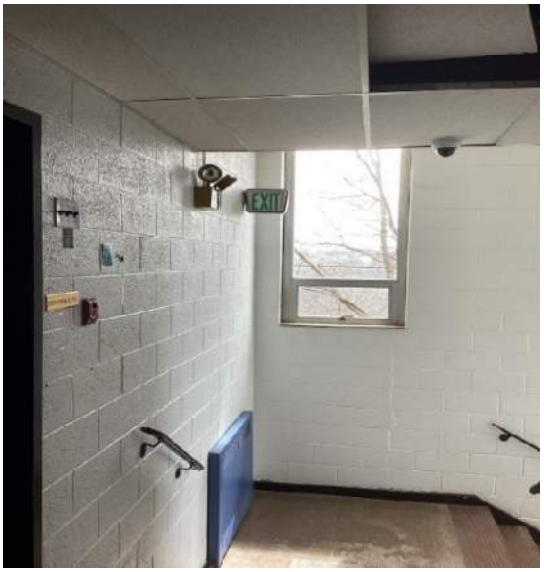
The building has an IT rack with switches, patch panels and an uninterrupted power source UPS. The rack feed data jacks located in most of the individual classrooms and wireless access points (WAPS) spread throughout the building. The rack includes cable tray for the cables routed to the IT rack. The switches in the racks are fed by a fiber optic cable. This rack contains the main feed from the utility and a fiber patch panel to feed the other buildings on campus. Existing IT infrastructure will be useable for a new system.

**Recommendation:** No curent recommandations.





**VIDEO SURVEILLANCE SYSTEM**
Currently there are multiple cameras in corridors and on the interior side of most exit doors.



**ACCESS CONTROL AND SECURITY SYSTEM**
There is no access control or security system installed.

# COURTYARD

## FINDINGS AND RECOMMENDATIONS

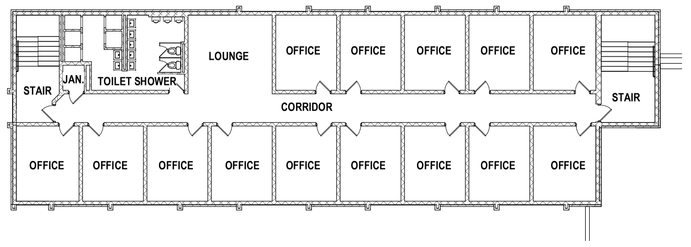
The courtyard is a 15,000 sf landscaped outdoor area wedged between Nikander Hall and Wargelin Hall. It has a concrete walk from Franklin Street up to the Summit Street parking lot. The walk provides access to the East entrances of Nikander and West entrances of Wargelin Hall. With the change in elevation between Franklin St and the parking lot, the walk has three sets of stairs with a large concrete retaining wall. The concrete stairs and retaining wall are showing signs of degradation and are beginning to crumble. The retaining wall steps are also missing a few sections of handrails, posing a safety concern that would need to be addressed prior to opening to pedestrians.

**Recommendation:** It is recommended to perform repairs to the retaining wall and steps to increase their longevity as well as minimize safety hazards. Handrails would also need to be installed on the retaining wall steps.

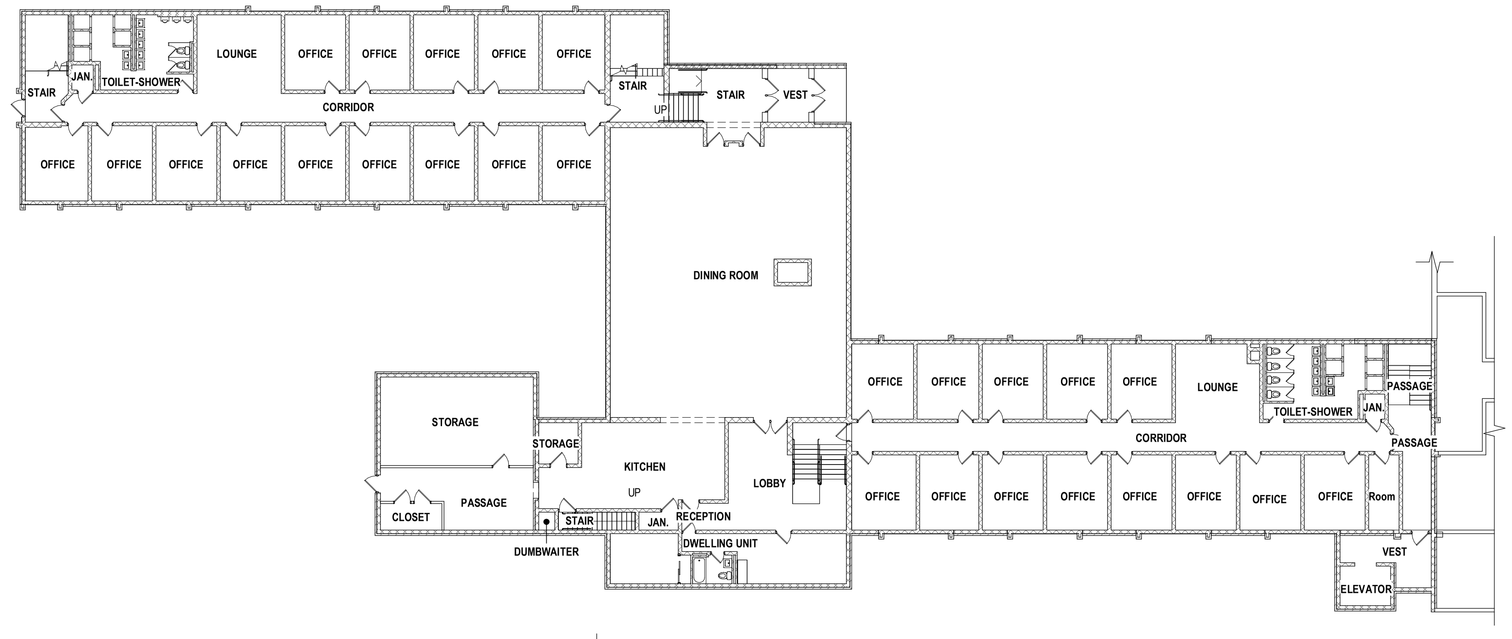
# FLOOR PLANS & SITE PLAN

MANNERHEIM HALL - EXISTING PLANS

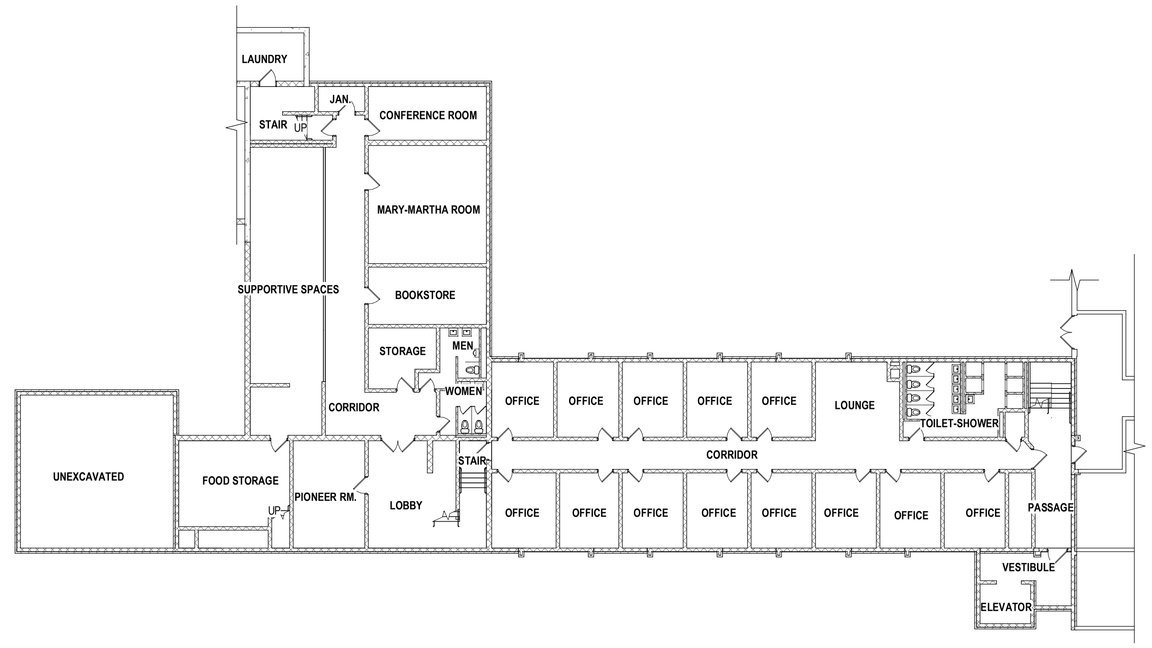
SECOND FLOOR PLAN - WEST WING



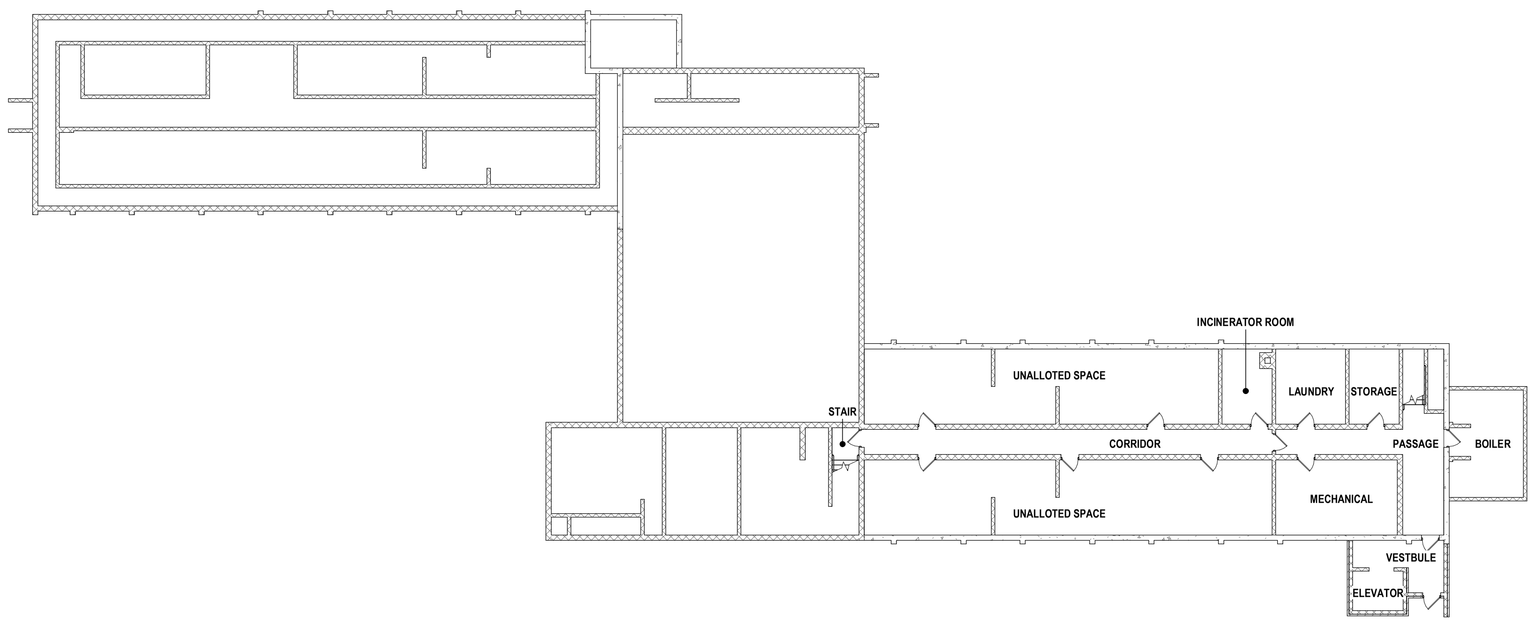

SECOND FLOOR PLAN - EAST WING & CENTER, FIRST FLOOR PLAN - WEST WING



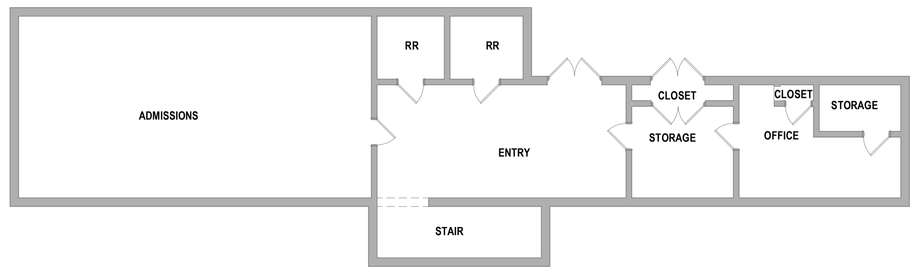

FIRST FLOOR PLAN - EAST WING & CENTER




FOUNDATION & BASEMENT PLAN



NIKANDER HALL - EXISTING PLANS




THIRD FLOOR PLAN

1" = 10'-0"

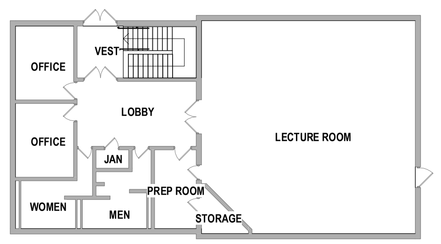

SECOND FLOOR PLAN

1" = 10'-0"


FIRST FLOOR PLAN

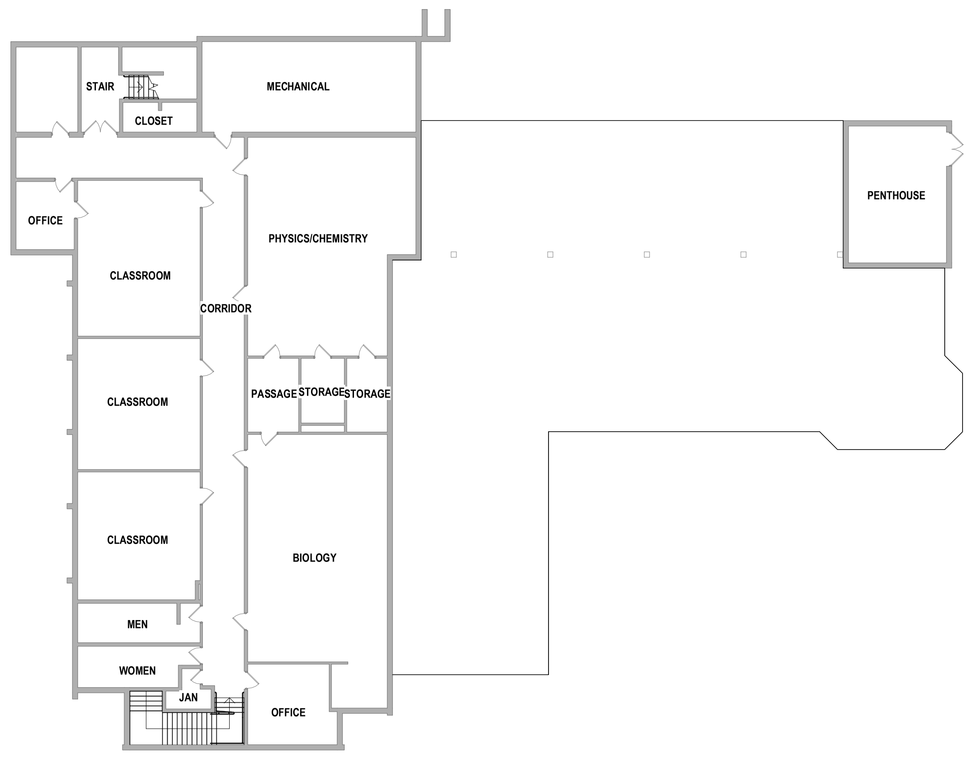
1" = 10'-0"

WARGELIN HALL - EXISTING PLANS



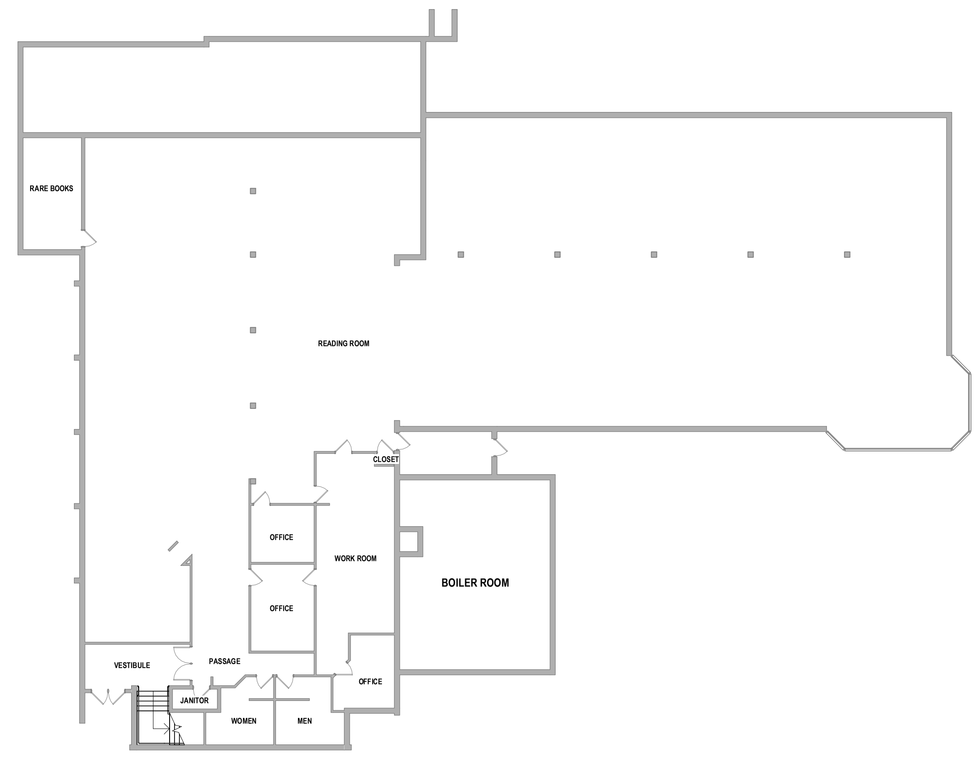

THIRD FLOOR PLAN

1/16" = 1'-0"




SECOND FLOOR PLAN

1/16" = 1'-0"




FIRST FLOOR PLAN

1/16" = 1'-0"

## STRUCTURES

**#100001 STORM MANHOLE**
T/CAST 748.85
10" METAL N INV 737.40
6" CAST IRON W INV 734.50

**#100002 STORM MANHOLE**
T/CAST 738.99
8" CAST IRON N INV 735.79
6" CAST IRON E INV 733.71
CAPPED 6" METAL W INV 735.04
10" CAST IRON W INV

**#100003 STORM MANHOLE**
T/CAST 738.45
10" CLAY E INV 731.80
12" TRUSS PIPE S INV 730.87
10" CLAY W INV 731.67
SAN PVC E to W T/PIPE 733.45

**#100004 MANHOLE**
T/CAST 742.96
POSSIBLE CAPPED E INV
CAPPED 6" SW INV 733.34
8" CLAY SW INV 731.43

**#100005 RD CATCH BASIN**
T/CAST 756.90
6" CLAY S INV 750.10

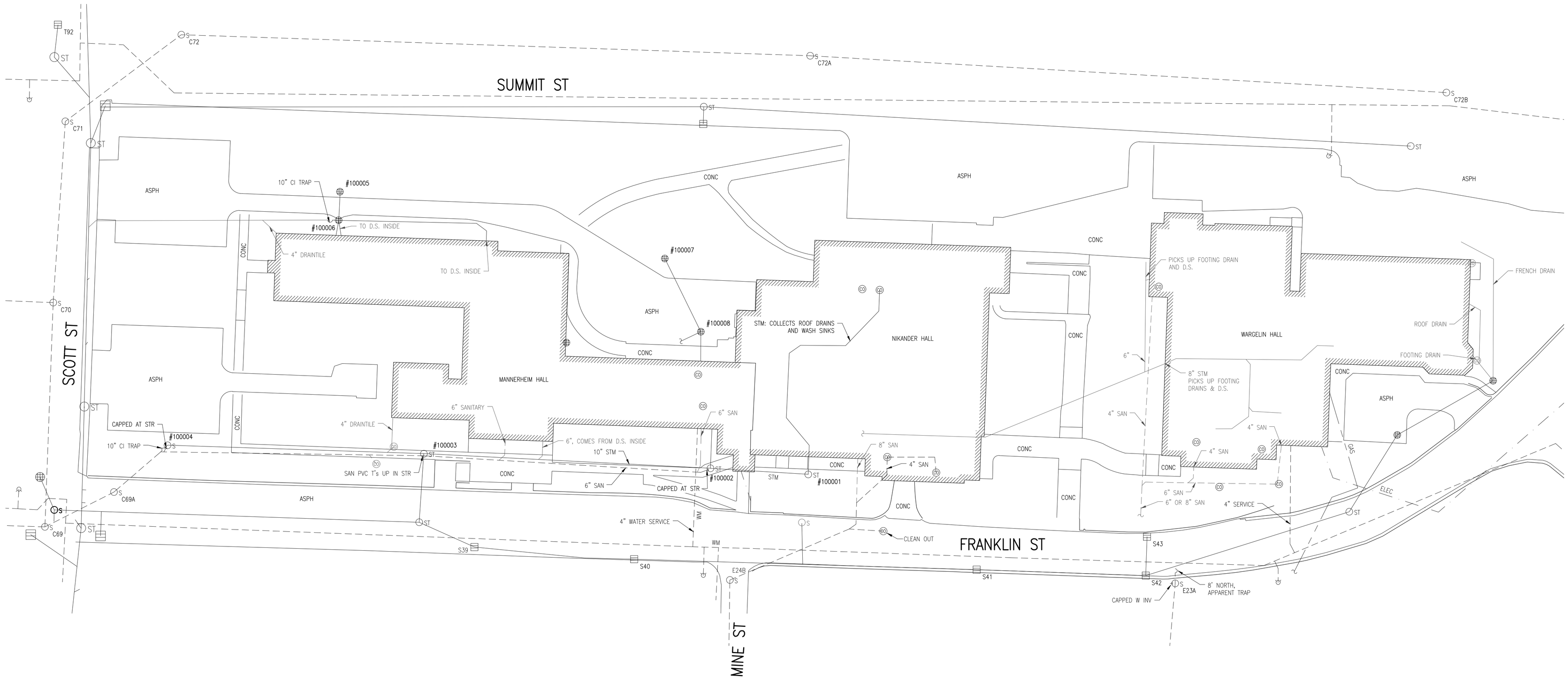
**#100006 RD CATCH BASIN**
T/CAST 755.97
6" CLAY N INV 749.35
6" E INV 748.72
4" S INV 750.31
10" TRUSS PIPE W INV 748.68

**#100007 RD CATCH BASIN**
T/CAST 749.81
6" CLAY S INV 745.95

**#100008 RD CATCH BASIN**
T/CAST 745.94
6" CLAY N INV 741.78
6" CLAY S INV 739.77
4" PVC SW INV 742.42

N

GRAPHIC SCALE: FULL 60 feet / HALF 30 feet
0 15 30 60 90




**NOTES:**
1) THE EXISTING UTILITY NETWORKS SHOWN IN THE DRAWINGS ARE BASED OFF OF AVAILABLE PLANS, CITY OF HANCOCK GIS, AND STRUCTURE SURVEY DATA.
2) THE ACCURACY ON THE LOCATION AND CONNECTIVITY MAY VARY FROM WHAT IS SHOWN.

Know what's **below.** **Call** before you dig.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PRELIMINARY - NOT FOR CONSTRUCTION

| ISSUED FOR: | DATE |
|---|---|
| FACILITY ASSESSMENT | 2025-01-13 |

| REVISION | DESCRIPTION |
|---|---|
| --- | --- |
| --- | --- |
| --- | --- |
| --- | --- |
| --- | --- |

PROJECT NUMBER 7030-24-0040
PM ---

CITY OF HANCOCK
FRANKLIN STREET BUILDING ASSESSMENT
HANCOCK, MI

EXISTING SITE PLAN

C-110



DRAWING PATH: P:\7000_7100\7030240040_FacAssessmentsUniversityBldgs\Drawings\SiteSheets\240040SUR.dwg January 13, 2025 - 1:38 PM

STRUCTURES

#100001 STORM MANHOLE
T/CAST 748.85
10" METAL N INV 737.40
6" CAST IRON W INV 734.50

#100002 STORM MANHOLE
T/CAST 738.99
8" CAST IRON N INV 735.79
6" CAST IRON E INV 733.71
CAPPED 6" METAL W INV 735.04
10" CAST IRON W INV

#100003 STORM MANHOLE
T/CAST 738.45
10" CLAY E INV 731.80
12" TRUSS PIPE S INV 730.87
10" CLAY W INV 731.67
SAN PVC E to W T/PIPE 733.45

#100004 MANHOLE
T/CAST 742.96
POSSIBLE CAPPED E INV
CAPPED 6" SW INV 733.34
8" CLAY SW INV 731.43

#100005 RD CATCH BASIN
T/CAST 756.90
6" CLAY S INV 750.10

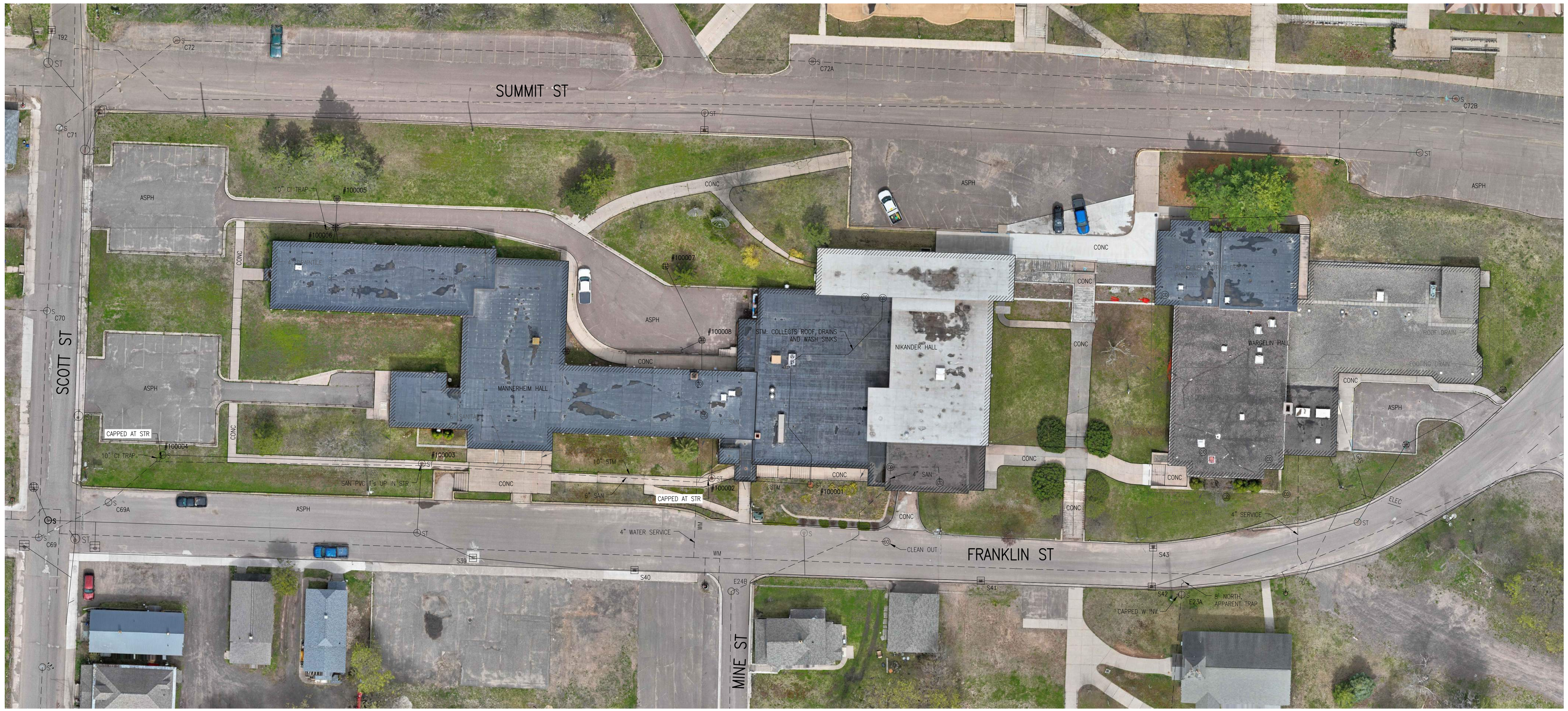
#100006 RD CATCH BASIN
T/CAST 755.97
6" CLAY N INV 749.35
6" E INV 748.72
4" S INV 750.31
4" S INV
10" TRUSS PIPE W INV 748.68

#100007 RD CATCH BASIN
T/CAST 749.81
6" CLAY S INV 745.95

#100008 RD CATCH BASIN
T/CAST 745.94
6" CLAY N INV 741.78
6" CLAY S INV 739.77
4" PVC SW INV 742.42

N

GRAPHIC SCALE: FULL 60 feet
HALF 30 feet
0 15 30 60 90




Know what's below. Call before you dig.

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PRELIMINARY - NOT FOR CONSTRUCTION

| ISSUED FOR: FACILITY ASSESSMENT | 2025-01-13 |
|---|---|
| REVISION DESCRIPTION | DATE |
| --- | --- |
| --- | --- |
| --- | --- |
| --- | --- |
| --- | --- |

| PROJECT NUMBER | PM |
|---|---|
| 7030-24-0040 | --- |

CITY OF HANCOCK
FRANKLIN STREET BUILDING ASSESSMENT
HANCOCK, MI

EXISTING SITE AERIAL

C-111



DRAWING PATH: P:\7000_7100\7030240040_FacAssessmentsUniversityBridge\Drawings\Site\Sheets\240040SUR.dwg January 13, 2025 - 1:38 PM

## STRUCTURES

#100001 STORM MANHOLE
T/CAST 748.85
10" METAL N INV 737.40
6" CAST IRON W INV 734.50

#100002 STORM MANHOLE
T/CAST 738.99
8" CAST IRON N INV 735.79
6" CAST IRON E INV 733.71
CAPPED 6" METAL W INV 735.04
10" CAST IRON W INV

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T/CAST 738.45
10" CLAY E INV 731.80
12" TRUSS PIPE S INV 730.87
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SAN PVC E to W T/PIPE 733.45

#100004 MANHOLE
T/CAST 742.96
POSSIBLE CAPPED E INV
CAPPED 6" SW INV 733.34
8" CLAY SW INV 731.43

#100005 RD CATCH BASIN
T/CAST 756.90
6" CLAY S INV 750.10

#100006 RD CATCH BASIN
T/CAST 755.97
6" CLAY N INV 749.35
6" E INV 748.72
4" S INV 750.31
10" TRUSS PIPE W INV 748.68

#100007 RD CATCH BASIN
T/CAST 749.81
6" CLAY S INV 745.95

#100008 RD CATCH BASIN
T/CAST 745.94
6" CLAY N INV 741.78
6" CLAY S INV 739.77
4" PVC SW INV 742.42

N

GRAPHIC SCALE: FULL 1" = 60 feet; HALF 1" = 30 feet
0 15 30 60 90

SUMMIT ST

SCOTT ST

FRANKLIN ST

MINE ST

CAMERA DID NOT MAKE IT THROUGH TRAP
10" CI TRAP
#100005
#100006
TO D.S. INSIDE
4" DRAINTILE
PIPE DOWNSIZED IN BUILDING, STOPPED VIDEO
#100007
LOCATED ON FLOOR, STANDING WATER, NO SIGNIFICANT VIDEO
LOCATED IN VERTICAL PIPE ALONG WALL
#100008
STM: COLLECTS ROOF DRAINS AND WASH SINKS
NIKANDER HALL
LOCATED IN BASEMENT, COULD NOT OPEN CLEANOUT
LOCATED ON 1ST FLOOR, COULD NOT OPEN CLEANOUT
MANNERHEIM HALL
LOCATION APPROXIMATE, APPEARS TO COLLECT ROOF DRAINS ALONG WITH WASH SINKS IN GARAGE AREA
REFUSAL, CAMERA FOGGED UP
CAPPED AT STR
#100004
CAMERA DID NOT MAKE IT THROUGH TRAP
#100003
CAMERA REFUSAL AT 35' FULL OF WATER
SAN PVC T's UP IN STR
6" SANITARY
6", COMES FROM D.S. INSIDE
10" STM
6" SAN
#100002
#100001
COULD NOT OPEN CAPPED PIPE
CAMERA REFUSAL, CLOGGED WITH ROOTS
4" WATER SERVICE
WM
CLEAN OUT
LOCATION APPROXIMATE, SANITARY CLEANOUT IN BASEMENT TO STRUCTURE E24B ON MINE ST.
SANITARY DROP CONNECTION
WARGELIN HALL
PICKS UP FOOTING DRAIN AND D.S.
LOCATED IN WALL ON MAIN FLOOR, COULD NOT OPEN CLEANOUT
FRENCH DRAIN
ROOF DRAIN
FOOTING DRAIN
8" STM PICKS UP FOOTING DRAINS & D.S.
LOCATED ON MAIN FLOOR, DID NOT DISTURB PIPE WRAP TO OPEN CLEANOUT
LOCATED IN TUNNEL, CAMERA COULDN'T MAKE BEND OUTSIDE OF BUILDING
4" SAN
6" OR 8" SAN
4" SERVICE
EXTERIOR CLEANOUT, CAMERA COULD NOT MAKE BENDS TO ACCESS PIPE, NO SIGNIFICANT VIDEO.
8" NORTH, APPARENT TRAP
CAPPED W INV
CAPPED PIPE TO WEST. CAMERA REFUSAL APPROXIMATELY 8' NORTH, APPEARED TO BE AN IN-LINE TRAP.
ASPH
CONC
ELEC
GAS

## LEGEND:

- FIELD INVESTIGATION LOCATION
- PIPE INVESTIGATED WITH VIDEO CAMERA

Know what's **below.** **Call** before you dig.


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ARCHITECTS ENGINEERS PLANNERS
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PRELIMINARY - NOT FOR CONSTRUCTION

| REVISION | DESCRIPTION | DATE |
|---|---|---|
| --- | ISSUED FOR: FACILITY ASSESSMENT | 2025-01-13 |

PROJECT NUMBER 7030-24-0040
PM ---

CITY OF HANCOCK
FRANKLIN STREET BUILDING ASSESSMENT
HANCOCK, MI

EXISTING SITE PLAN - INVESTIGATIONS

C-112



DRAWING PATH: P:\7000_7100\7030240040_FacAssessments\University\Bldgs\Drawings\SiteSheets\240040SUR.dwg January 13, 2025 - 1:38 PM

# OPINION OF PROBABLE COST

# Franklin Street Facility Assessments - Mannerheim

| | | QTY | Unit | Cost/Unit | Total |
|---|---|---|---|---|---|
| **1** | **Site** | | | | **$ 220,000** |
| Sewer replacements/ further investigations | | 1 | LSUM | | $ 150,000 |
| Reconstuct both asphalt parking lots | | 1000 | Syd | $ 50 | $ 50,000 |
| ADA Access sidewalks | | 1 | LSUM | | $ 20,000 |
| | | | | | |
| **2** | **Building Envelope** | | | | **$ 48,000** |
| Exterior wall repairs/ repointing/ resealing | | 1 | LSUM | | $ 40,000 |
| Roof Inspection | | 1 | LSUM | | $ 5,000 |
| Scrupper conductors | | 2 | Ea | $ 1,500 | $ 3,000 |
| | | | | | |
| **3** | **Building Interior** | | | | **$ 81,800** |
| Repaint Walls and Ceilings as needed | | 15,000 | Sf | $ 3 | $ 45,000 |
| Damaged acoustic tile replacement | | 500 | Sf | $ 10 | $ 5,000 |
| Glue on ceiling tile replacement | | 900 | Sf | $ 12 | $ 10,800 |
| Wood Framed walls removal | | 7 | Ea | $ 3,000 | $ 21,000 |
| | | | | | |
| **4** | **Safety and Security** | | | | **$ 345,000** |
| Sprinkler System | | 29500 | Sf | $ 10 | $ 295,000 |
| Security camera system and controls | | 1 | LSUM | | $ 50,000 |
| | | | | | |
| **5** | **Hazardous Material** | | | | **$ 414,000** |
| Asbestos tile flooring removal | | 1 | LSUM | | $ 250,000 |
| New vinyl flooring | | 20500 | Sf | $ 8 | $ 164,000 |
| | | | | | |
| **6** | **ADA Accessibility** | | | | **$ 665,000** |
| Bathroom renovations | | 6 | Ea | $ 15,000 | $ 90,000 |
| Elevator | | 1 | Ea | | $ 500,000 |
| Revise door sizes | | 25 | Ea | $ 3,000 | $ 75,000 |
| | | | | | |
| **7** | **Mechanical** | | | | **$ 417,800** |
| Replace boiler | | 1 | Ea | | $ 50,000 |
| Replace pumps | | 2 | Ea | $ 5,000 | $ 10,000 |
| AHU replacement | | 1 | Ea | | $ 100,000 |
| Exhaust fan replacement | | 12 | Ea | $ 10,000 | $ 120,000 |
| Convectors and finned tube radiation replacement | | 21 | Ea | $ 1,800 | $ 37,800 |
| Replace pneumatic controls with digital | | 1 | LSUM | | $ 100,000 |
| | | | | | |
| **8** | **Plumbing** | | | | **$ 240,000** |
| Replace all toilets, urinals, lavatories, and showers | | 60 | Ea | $ 2,500 | $ 150,000 |
| Replace roof drains and add overflow drains | | 6 | Ea | $ 5,000 | $ 30,000 |
| Replace electric water heater with gas | | 2 | Ea | $ 30,000 | $ 60,000 |
| | | | | | |
| **9** | **Electrical** | | | | **$ 600,000** |
| Fire alarm system and detection panel upgrades | | 1 | LSUM | | $ 175,000 |
| Replace emergency lighting with LED and add fixtures to bring up to code | | 20 | Ea | $ 1,500 | $ 30,000 |
| 400A main servic panleboard replacement | | 1 | Ea | | $ 50,000 |
| Replace branch panels | | 10 | Ea | $ 5,000 | $ 50,000 |
| Replace exterior lights with LEDs. Add new controls | | 16 | Ea | $ 2,500 | $ 40,000 |
| Replace all interior lights with LEDs | | 25,600 | Sf | $ 10 | $ 256,000 |

| | |
|---|---|
| **SUBTOTAL** | **$ 3,030,000** |
| Soft Costs (27%) | $ 818,000 |
| Contingency (15%) | $ 455,000 |
| **Mannerheim Total Opinion of Probable Cost** | **$ 4,300,000** |

# Franklin Street Facility Assessments - Wargelin

| | | QTY | Unit | Cost/Unit | Total |
|---|---|---|---|---|---|
| **1** | **Site** | | | | **$ 155,000** |
| Testing and Video Inspection of Sewer. Separate systems and tie into City system. | | 1 | LSUM | | $ 50,000 |
| Chain link fence repairs, Misc curb-and-gutter repairs, sidewalk flag repalcement | | 1 | LSUM | | $ 15,000 |
| Reconstuct north parking lot | | 960 | Syd | $ 50 | $ 48,000 |
| Resurface 16-car and 3-car parking lot. | | 750 | Syd | $ 40 | $ 30,000 |
| ADA Access sidewalks | | 300 | Syd | $ 40 | $ 12,000 |
| | | | | | |
| **2** | **Building Envelope** | | | | **$ 295,000** |
| Repoint retaining wall caps | | 1 | LSUM | | $ 10,000 |
| Exterior wall repairs/ repointing/ resealing | | 1 | LSUM | | $ 40,000 |
| Strucutral Engineer Inspection | | 1 | LSUM | | $ 5,000 |
| EDPM Roof Replacement and insulation | | 16000 | Sf | $ 15 | $ 240,000 |
| | | | | | |
| **3** | **Building Interior** | | | | **$ 112,000** |
| Repaint Walls and Ceilings as needed | | 15,000 | Sf | $ 3 | $ 45,000 |
| Wall crack repointing | | 1 | LSUM | | $ 20,000 |
| Damaged acoustic tile replacement | | 500 | Sf | $ 10 | $ 5,000 |
| Cantilevered walkway repairs | | 90 | Cft | $ 300 | $ 27,000 |
| Exterior door replacement | | 3 | Ea | $ 5,000 | $ 15,000 |
| | | | | | |
| **4** | **Safety and Security** | | | | **$ 325,000** |
| Sprinkler System | | 27500 | Sf | $ 10 | $ 275,000 |
| Security camera system and controls | | 1 | LSUM | | $ 50,000 |
| | | | | | |
| **5** | **Hazardous Material** | | | | **$ 115,000** |
| Asbestos tile flooring removal | | 1 | LSUM | | $ 75,000 |
| New vinyl flooring | | 5000 | Sf | $ 8 | $ 40,000 |
| | | | | | |
| **6** | **ADA Accessibility** | | | | **$ 615,000** |
| Bathroom renovations | | 6 | Ea | $ 15,000 | $ 90,000 |
| Elevator | | 1 | Ea | | $ 500,000 |
| Door harware replacement | | 25 | Ea | $ 1,000 | $ 25,000 |
| | | | | | |
| **7** | **Mechanical** | | | | **$ 555,000** |
| Replace steam boilers with hydronic boilers | | 2 | Ea | $ 50,000 | $ 100,000 |
| Replace pumps | | 2 | Ea | $ 5,000 | $ 10,000 |
| Demo induction units, ductwok, piping, and ahu's. Demo gravity relief hoods, ductwok, and return grilles. Remove steam pipes | | 1 | LSUM | | $ 20,000 |
| AHU replacement | | 3 | Ea | $ 75,000 | $ 225,000 |
| Condensor replacement | | 1 | Ea | | $ 20,000 |
| Convectors and finned tube radiation replacement | | 1 | LSUM | | $ 40,000 |
| Cabinet unit heater replacement - includes hydronic piping | | 1 | LSUM | | $ 40,000 |
| Replace pneumatic controls with digital | | 1 | LSUM | | $ 100,000 |
| | | | | | |
| **8** | **Plumbing** | | | | **$ 795,000** |
| Replace all toilets, urinals, and lavatories | | 30 | Ea | $ 25,000 | $ 750,000 |
| Replace roof drains and add overflow drains | | 6 | Ea | $ 5,000 | $ 30,000 |
| Replace electric water heater with gas | | 1 | Ea | | $ 15,000 |
| | | | | | |
| **9** | **Electrical** | | | | **$ 560,000** |
| Fire alarm system and detection panel upgrades | | 1 | LSUM | | $ 175,000 |
| Replace emergency lighting with LED and add fixtures to bring up to code | | 15 | Ea | $ 1,500 | $ 22,500 |
| 400A main servic panleboard replacement | | 1 | Ea | | $ 50,000 |
| Replace branch panels | | 3 | Ea | $ 5,000 | $ 15,000 |
| Replace exterior lights with LEDs. Add new controls | | 10 | Ea | $ 2,500 | $ 25,000 |
| Replace all interior lights with LEDs | | 27,500 | Ea | $ 10 | $ 275,000 |
| | **SUBTOTAL** | | | | **$ 3,530,000** |
| | Soft Costs 27% | | | | $ 953,000 |
| | Contingency (15%) | | | | $ 530,000 |
| | **Wargelin Total Opinion of Probable Cost** | | | | **$ 5,010,000** |

# Franklin Street Facility Assessments - Nikander

| | | QTY | Unit | Cost/Unit | Total |
|---|---|---|---|---|---|
| **1** | **Site** | | | | **$ 113,000** |
| Testing and Video Inspection of Sewer. Separate systems and tie into City system. | | 1 | LSUM | | $ 50,000 |
| Reconstuct parking lot | | 860 | Syd | $ 50 | $ 43,000 |
| ADA Access sidewalks | | 1 | LSUM | | $ 20,000 |
| | | | | | |
| **2** | **Building Envelope** | | | | **$ 151,000** |
| Exterior wall repairs/ repointing/ resealing | | 1 | LSUM | | $ 40,000 |
| Roof inspection/ reseal seams | | 1 | LSUM | | $ 15,000 |
| Single Pane window replacement | | 24 | Ea | $ 4,000 | $ 96,000 |
| | | | | | |
| **3** | **Building Interior** | | | | **$ 61,000** |
| Repaint Walls and Ceilings as needed | | 10,000 | Sf | $ 3 | $ 30,000 |
| Damaged acoustic tile replacement/ repaint ceiling as needed | | 1000 | Sf | $ 10 | $ 10,000 |
| Wood Framed walls removal | | 7 | Ea | $ 3,000 | $ 21,000 |
| | | | | | |
| **4** | **Safety and Security** | | | | **$ 210,000** |
| Sprinkler System | | 16000 | Sf | $ 10 | $ 160,000 |
| Security camera system and controls | | 1 | LSUM | | $ 50,000 |
| | | | | | |
| **5** | **Hazardous Material** | | | | **$ 189,000** |
| Asbestos tile flooring removal | | 1 | LSUM | | $ 125,000 |
| New vinyl flooring | | 8000 | Sf | $ 8 | $ 64,000 |
| | | | | | |
| **6** | **ADA Accessibility** | | | | **$ 600,000** |
| ADA upgrades | | 1 | LSUM | | $ 100,000 |
| Elevator | | 1 | Ea | | $ 500,000 |
| | | | | | |
| **7** | **Mechanical** | | | | **$ 345,000** |
| AHU testing | | 1 | Ea | | $ 5,000 |
| Add ventilation as required by code | | 1 | LSUM | | $ 50,000 |
| Remove steam piping | | 1 | LSUM | | $ 10,000 |
| Replace all convectors | | 1 | LSUM | | $ 30,000 |
| Add boilers and pumps - includes hydronic piping | | 1 | LSUM | | $ 150,000 |
| Replace pneumatic controls with digital | | 1 | Ea | | $ 100,000 |
| | | | | | |
| **8** | **Plumbing** | | | | **$ 150,000** |
| Salvage all toilets, urinals, and lavatories | | 20 | Ea | $ 1,000 | $ 20,000 |
| Replace roof drains | | 4 | Ea | $ 5,000 | $ 20,000 |
| Water piping, sanitary piping, and water heater inspection. | | 1 | LSUM | | $ 10,000 |
| New water main and meter | | 1 | LSUM | | $ 100,000 |
| | | | | | |
| **9** | **Electrical** | | | | **$ 430,000** |
| Fire alarm system and detection panel upgrades | | 1 | LSUM | | $ 175,000 |
| Replace emergency lighting with LED and add fixtures to bring up to code | | 15 | Ea | $ 1,500 | $ 22,500 |
| Main service disconnect | | 1 | LSUM | | $ 10,000 |
| New electrical service and meter | | 1 | Ea | | $ 30,000 |
| Replace branch panels | | 2 | Ea | $ 5,000 | $ 10,000 |
| Replace exterior lights with LEDs. Add new controls | | 10 | Ea | $ 2,500 | $ 25,000 |
| Replace all interior lights with LEDs | | 16,000 | Sf | $ 10 | $ 160,000 |
| | | | | **SUBTOTAL** | **$ 2,250,000** |
| | | | | Soft Costs (27%) | $ 608,000 |
| | | | | Contingency (15%) | $ 338,000 |
| | | | | **Nikander Total Opinion of Probable Cost** | **$ 3,200,000** |

# Franklin Street Facility Assessments - Courtyard

| | | QTY | Unit | Cost/Unit | Total |
|---|---|---|---|---|---|
| **1** | **Stair Repairs** **QTY's are estimated* | | | | **$ 151,500** |
| Hand Chipping | | 400 | CFT | $ 150 | $ 60,000 |
| Hand Patching | | 400 | CFT | $ 175 | $ 70,000 |
| Wall/ Step Coating | | 20 | Gal. | $ 700 | $ 14,000 |
| Handrail | | 60 | LF | $ 125 | $ 7,500 |
| | | | | | |
| | | | | | |

| | |
|---|---|
| **SUBTOTAL** | **$ 152,000** |
| Soft Costs (27%) | $ 41,000 |
| Contingency (15%) | $ 23,000 |
| **Courtyard Total Opinion of Probable Cost** | **$ 220,000** |

# HYDRANT FLOW TEST DATA

# Fire Hydrant Flow Test

| | | | |
|---|---|---|---|
| Project: | Franklin Street Building Assessment | Location: | Hancock, MI |
| Project Number: | 7030-24-0040 | Tested by: | Chase Daavettila, Kyle Mattson |
| Owner: | City of Hancock | | |

424 Hancock Street
Hancock, MI 49930
p 906.482.0535 f 906.482.6453

| Test # | DATE | TIME | Test Guage "A" | | Variables | | | Hydrant Flow | Total Flow | | Static/Res Hydrant | Flow Hydrant |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Static Pressure (psig) $P_s$ | Residual Pressure (psig) $P_r$ | Pitot (Psig) p | Dia (in.) | Hyd Coef C | Actual Flow (gpm) Qf | Actual (gpm) Qf | At 20 psi (gpm) Q20 | | |
| 1 | 11/20/2024 | 10:30 | 62 | 45 | 28 | 2.5 | 0.9 | 887 | 887 | 1445 | 161 | 163 |
| 2 | 11/20/2024 | 10:55 | 62 | 43 | 27.5 | 2.5 | 0.9 | 879 | 879 | 1349 | 161 | 132 |
| 3 | 11/20/2024 | 11:05 | 62 | 44 | 36 | 2.5 | 0.9 | 1006 | 1006 | 1589 | 163 | 161 |
| 4 | 11/20/2024 | 11:20 | 120 | 98 | 44 | 2.5 | 0.9 | 1113 | 1113 | 2521 | 162 | 131 |
| 5 | 11/20/2024 | 11:40 | 130 | 97 | 70.5 | 2.5 | 0.9 | 1408 | 1408 | 2697 | 131 | 162 |

Threads: National Standard or Detroit

$Q_f = 29.83cd^2 (p)^{0.5}$ d = 2 ½" c = 1, with flow tube or "stream straightener"

$Q_r$ = Flow at desired residual

c: Coefficient of discharge 0.90 (outlet smooth and rounded), 0.80 (outlet square and sharp), 0.70 (outlet square and projects inwards)

d = diameter of the outlet in inches

p = velocity head (measured and pilot tube reading),psi

$Q_{20} = Q_f \times (P_s\text{-}20)^{.54} / (P_s\text{-}P_f)^{.54}$

$Q_r = Q_f (h_r/h_f)^{0.54}$

Where:

$Q_{20}$ = Available fire flow at 20 psi.

$P_s$ = Pressure measured at the static hydrant during field testing.

$P_r$ = Pressure measured at the residual hydrant during field testing.

$H_f$ = Pressure drop during test

$H_r$ = Pressure drop to desired residual

**$Q_f$ = flow during test**

Desired pressure drop: 25% (10 PSI min)


Know what's below. Call before you dig. 811

| | | |
|---|---|---|
| C-111 | PROJECT NUMBER 7030-24-2040 PM -- | ISSUED FOR: -- -- |
| | CITY OF HANCOCK | REVISION DESCRIPTION DATE |
| | FRANKLIN STREET BUILDING ASSESSMENT | -- -- -- -- -- -- -- -- -- -- |
| | HANCOCK, MI | PRELIMINARY - NOT FOR CONSTRUCTION |
| | EXISTING SITE AERIAL | OHM ARCHITECTS SCIENTISTS ENGINEERS PLANNERS OHMADVISORS.COM |

Snip from City of Hancock Water System Map