CONDITION SURVEY REPORT for AIDEA Building 813 W. Northern Lights Anchorage, AK

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PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

1. General

The AIDEA building is a 36,000 square foot three story office building that was originally constructed as a bank in 1974 and gone through several renovations over the years. The facility includes cubical style open office areas, private offices and conference rooms spread throughout the building space. The building also houses a server room in the basement.

At the end of the report a spreadsheet is provided breaking down building systems, remaining life expectancy and rough estimates of cost.

2. Condition Survey

The mechanical condition survey took place on August 18, 2020. The survey was conducted to assess the condition of the existing mechanical, electrical and structural systems with respect to physical condition and current compliance with codes.

Inspection of the existing building components and systems were primarily based on visual nondestructive methods; and interviews with the building maintenance. Concealed elements of construction where not inspected. The focus of the inspection was on the central mechanical and electrical systems; a few unoccupied office spaces were also surveyed.

MECHANICAL

The facility was inspected in reference to the following codes along with general observations of the condition of the equipment.

Referenced Codes

2012 Uniform Plumbing Code (UPC)
2012 International Mechanical Code (IMC)
2012 International Building Code (IBC)

Service life estimates are given for the major pieces of equipment. Service life estimates are based on ASHRAE guidelines. Listed below are equipment items from the ASHRAE Service Life Estimates guidelines. Note actual service life can vary greatly depending on maintenance and operating conditions.

Equipment Item	Median Years
Boilers Steel, Cast Iron	35
Unit Heaters, Hot Water	20
Radiant Ceiling Heaters	25
Fin-Tube Heaters (Baseboard)	25
VAV Boxes	20
Fans, Centrifugal	25
Fans, Propeller	15
Coils, Water	20
Packaged Chiller, Reciprocating	20
Pumps, Base-mounted	20
Controls, Electronic	15
Valve Actuators	15
Piping	40

1. Heating System

The heating system is comprised of heating water boilers, circulating pumps, and terminal heating equipment.

a. Heating Boilers: The facility is heated with two standard efficiency non-condensing gas fired boilers. The boilers are Weil McLain series 88 model 988 with a gas input of 2,737 MBH and heating output of 2,274 MBH. The boilers were installed in 2019 after the November 2018 earthquake and are in good working condition, but are not as efficient as condensing type boilers. The service life of this type of boiler is around 35 years. See photo M1.
b. Pumps: The heating system consists of two system level pumps. The two main heating system circulation pumps are Wilo vertical inline pumps, CP-1 model S2x40 capable of 100 gpm at 46 ft. of head, CP-2 model S2x40 capable of 80 gpm at 30 ft. of head. The pumps' primary function is to pump heated water to all the heating coils and heating terminal units through-out the facility. The pumps are not redundant, and serve different parts of the building. The pumps are fairly new (replaced in 2016 and 2018) and in good working condition.
c. Terminal Equipment: The facility is heated by a mixture of heated air and baseboard along exterior walls. The sample of terminal heat equipment assessed was in good condition. Typical service life for baseboard heaters are 25 years. The service life of cabinet unit hears is 20 years.
d. Piping: The heating system is copper piping that is in fair condition with some signs of leaks and corrosion. The service life of copper piping is 40 years.
e. Miscellaneous: The facility heating system does not have an air separator installed in the heating lines. This could lead to a shorter life expectancy of the main circulator pumps due to air trapped in the system.

2. Cooling System

The cooling system is comprised of chillers, circulating pumps, a heat rejection fan, and cooling coils in the AHUs. One pump circulates chilled water to the AHU cooling coils, while the other pump circulates the heat rejection water to cool the condensers. This water is pumped to the heat rejection fan in the penthouse.

a. Chillers: The facility is cooled by a modular Multistack chiller system. The chillers are water cooled with two compressors per chiller. One chiller consists of two 15 ton compressors, the other has two 20 ton compressors. The unit voltage is 460V/3ph. The chillers appear to be well maintained and in good working condition and were installed in 2016.
b. Pumps: There are two chiller pumps that operate in a primary standby mode. The pumps are Bell and Gossett vertical inline pumps rated for 7.5 HP at 460V/3ph. Both pumps are connected to VFD's. The pumps are in good condition and were installed in 2016 as part of the chiller project. See photo M2.

c. Piping: The cooling system is a mixture of copper piping and steel victaulic that is in fair condition with some signs of leaks and corrosion. The service life of copper is 40-50 years.

3. Ventilation System

The building ventilation system is comprised of one air handling unit located in the basement (F-4) and a combination of supply, return and relief fans located in the penthouse. This equipment is original to the construction of the facility. There is also a new Rooftop Unit serving the recent conference room remodel. VAV boxes are utilized for all air distribution systems.

a. F-4: Air handling unit number F-4 provides ventilation for the First floor south mezzanine and 1st floor floor grilles. The unit is constant volume and has a mixing box, filter, heating coil, cooling coil, and supply fan. The unit is in fair to poor condition and appears to be original to the facility. It does appear to have been well maintained over the years. The piping connections to the heating and cooling coil are in poor condition with one having an active leak at the time of inspection. The 3-way control valves are pneumatic and also corroded. The motorized dampers for the mixing box are electric. The insulation for the piping in the fan room containing F-4 is falling apart at points and possibly contains hazardous materials. AHU body itself is not seismically restrained to the floor. A typical AHU frame has a 40 year service life. See photo M3.
b. F-2: Fan 2 is a Greenheck inline fan model QEI-33-II-300-X. This fan acts as the supply fan to a large built up air handling system and has a system level cooling coil, mixing box and filter bank. F-2 is controlled by a VFD. The fan serves 1st floor north, mezzanine north and 2nd floor. The main supply duct breaks into smaller ducts serving each zone. Each of these zone branches has a heating coil with a pneumatic control valve.
c. F-1: Fan 1 is an inline fan original to the building that serves the 1st floor interior. Similar to F-2, this fan acts as a supply fan to a large built up air handling system with a system level cooling coil, mixing box and filter bank..
d. F-3: Fan 3 acts as the plenum return fan for both F-1 and F-2. It is original to the building. F-3 is a Joy Manufacturing Company model number 27-17-860.
e. RTU-1: RTU-1 is a gas fired roof top unit with dx cooling. It is a Trane YSC model with 6 tons of cooling and 150 MBH gas heating input. The unit was manufactured in 2019 and is in new working condition. This unit serves the first floor conference room only.
f. Heat Rejection Fan: Heat from the chiller condensing units is rejected to a water loop, which is pumped up to the penthouse. The water then passes through a large coil in the heat rejection fan. The fan is a Baltimore Coil unit model number VIO-41/KMDX and blows outside air over the coil to finally reject the heat to outside the building though a hood on the roof. We were unable to determine the age of the unit, but it appears to be in good working condition. Piping to the coils is through Victaulic piping, which is also in good condition.
g. Terminal units (AHU-1): The terminal units throughout the building are variable volume (VAV) boxes. Each box has a digital control damper. Although each box has an associated DDC controlled damper, the DDC system is limited to setting the VAV boxes control damper to two positions, minimum and fully open. The boxes do not have heating coils. RSA inspected a small sample of these boxes and they were all in good condition.

4. Plumbing

a. Electric water heater: Hot water for the facility is generated by a single 80 gallon electric water heater. The unit is a Vanguard model 3WA76, 4.5 Kw, 240/208V 1ph. The unit appears to be in good working condition and no complaints regarding the domestic hot water were noted. The domestic hot water system does not have a circulation pump. See photo M4.
b. Piping: The water piping is copper piping. The waste, vent, and rain leader piping is cast iron. Some issues were reported with the domestic water piping system; occasional leaks and occasional miscoloration. We understand there have been reports of discolored water, however the water looked at appeared clear. Piping typically has a 40-50 year service life which would be putting it near the end of its expected life.

5. Control System

a. The original pneumatic control system has begun to be phased out and replaced with a direct digital control (DDC) system. The DDC system is an Alerton system that is approximately 3 years old and is in good working condition. The DDC system is controlling the main supply fans, as well as, the zone controls. The system uses a combination of electric and pneumatic actuators. Electrical actuators are used on the air side dampers and vav box actuators. The original pneumatic actuators and valves are used on the hydronic system. As part of the DDC upgrade, electric controls were installed to control the pneumatic valves. The pneumatic actuators and valves are in poor condition/obsolete and should be replaced. Pneumatic controls are considered an aging technology, and the valves and piping which they control are corroded and susceptible to failure.

6. Specific Issues

a. Ventilation Fans: Ventilation Fans F-1, F-3 and F-4 are original to the building and at the end of their usable life. Fan F-4 in the basement could be replaced in kind with reasonable effort. Modern Air Handling Units can be delivered to the site knocked down so all pieces fit through a standard door, then re-assembled in the fan room. Fans F-1 and F-3 located in the penthouse pose a bigger challenge to replace. A fair amount of demolition would be necessary to bring new units in, possibly removing O/A louvers or walls of the penthouse.
b. Control valves and Coil Piping: From what was observed in the site survey, existing control valves on the heating and cooling coils have pneumatic valves that are electrically controlled by the DDC. These can be re-used with electric valves, so new control points are not anticipated. RSA recommends to replace the pneumatic with electric control valves controlled by the building DDC. It was also noted the smaller branch piping serving these heating and cooling coils is corroding and the insulation is falling off. Also recommend replacing the branch piping servings the air coils.

c. Air Separator: There is no air separator in the main hydronic loop prior to the system pumps. An air separator should be installed in the heating line upstream of the system pumps to protect the pumps from air in the system and cavitation.

d. Domestic Water System: There are reports of discoloration and occasional leaks in the domestic water system. While the water heater itself is in good condition, the piping itself appears to be mostly original to the building and is reaching the end of its useful life. RSA recommends replacing in the next 5-10 years. At the time of the plumbing piping replacement, RSA also recommends adding a hot water recirculation line to minimize waiting time for hot water at distant fixtures.

7. Conclusion

The mechanical systems in the building have been well maintained and range from new to fair condition. The biggest issue for the mechanical system other than the specific issues listed above is the age of the systems. The building is 45 years old and mechanical equipment original to the building is at the end of its useful life and should be considered for replacement. The heating boilers, chillers, pumps, roof top unit are all fairly new and appear to be working as designed. A controls upgrade to replace all pneumatic controls with DDC is also recommended. There are no existing drawings of the mechanical systems, a thorough investigation would be necessary to determine the extent of the pneumatic system.

Photo M1


Photo M2

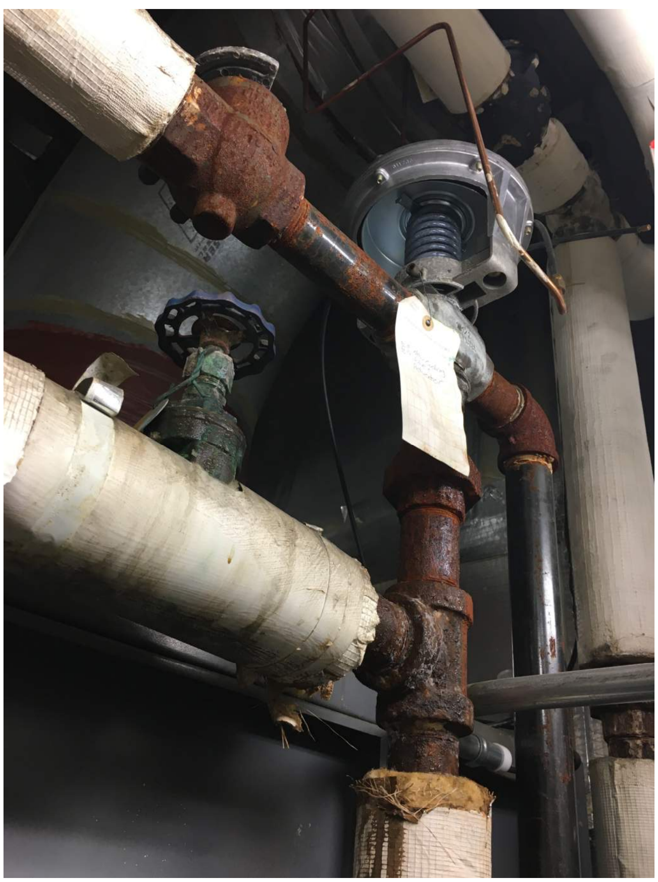

Photo M3


349-6550
SUPERIOR MECH.
INSTALLED
02-25-09
Energy Efficient
ANGUARD
Photo M4

ELECTRICAL

The building systems were reviewed for conformance of the following adopted codes and standards:

2015 International Building Code (IBC)
2015 International Fire Code (IFC)
2017 National Electrical Code (NEC)
2016 NFPA 72 National Fire Alarm Code
IES Lighting Handbook, Tenth Edition

Power Systems

Building Electrical Service:

Condition: The serving electrical utility for the building is Anchorage Municipal Lighting and Power (ML&P). ML&P steps down the utility distribution voltage to serve the building at 277/480 volts (V), 3-phase, 4-wire, wye-connected, via a 300 kilovolt amperes (kVA) pad-mounted transformer located in the NW corner of the building.

The service lateral from ML&P's transformer is routed underground to the Main Distribution Panel (MDP) located in the electrical room. The electrical room is located in the basement just north of the center on the west wall of the facility. The MDP has six circuit breakers used for the main disconnecting means. This would require firefighting or ML&P personnel to enter the building and switch off the six breakers to kill power to the building. When the building was constructed, this was allowed by both the MOA and ML&P, however based on MOA amendment 23.30.230.70(A)(3) this practice is no longer allowed. However, MOA has been allowing existing installations to be "grandfathered", as long as major renovations to the electrical service are not completed.

Recommendations: At this time, we do not feel that any upgrades to the service are necessary. However, the owner should weight the risks of having the main electrical disconnect equipment inside the building, as there may be some life safety or property damage issues if access to the equipment was rendered impossible due to a catastrophic event.

Main Distribution Panel:

Condition: The MDP was manufactured by General Electric in the early 1970's. The unit is an AV-line switchboard and is rated for 600 ampere (A), 277/480V, 3-phase, 4-wire. The existing switchboard appeared to be in average condition for its age and usage. At this point, we have not heard many complaints about finding spare parts for this equipment. However, as the equipment gets older, maintenance and repairs on the systems become increasingly more difficult.

Based on a 1-year demand history provided by ML&P, the calculated demand load is approximately 142 kilowatts (kW), or 213A at 480V. Therefore, the existing MDP is sized adequately for the existing load, as well as any additional load that may added under a similar office use and the current building footprint. Although the MDP is sized for the building loads, there is no physical space to add more circuit breakers. Additionally, per NEC article 230.71 the maximum number of main disconnects is 6. Therefore, any equipment added to the MDP that would require additional circuit breaker(s) would trigger a service upgrade, which would include moving the main disconnect to the building exterior as described previously.

As stated, the MDP serves six major load segments for the building including: the elevator, panelboard “BL” (basement lighting) located in the electrical room, BMCC (basement motor control center), PMCC (penthouse motor control center), panel “1L” (intermediate lighting panels, which appears to serve power and lighting panels on the 1st, 2nd and mezzanine floors), as well as panel “SDP” (Sub Distribution Panel).

Recommendations: At this time, we do not feel that upgrades to the MDP are necessary. However, the owner should weigh the possibility of prolonged outages at the facility in the case of a failure of equipment without access to spare parts. Also, if any upgrades involve the addition of major electrical loads, a service upgrade would be required. We feel that replacement of the MDP should be in a 10-year maintenance schedule.

Elevator Electrical Feed:

Condition: The electrical equipment associated with the elevator appears to be from the original construction. The equipment is in average condition for its age and use and it appears to meet the code requirements at the time of installation.

Recommendation: At this time, we do not feel that upgrades to the elevator feeder are necessary.

Panel “BL”

Condition: Panel “BL” is fed from the 2nd main breaker in the MDP and it is the basement lighting panel. The panel was manufactured by General Electric in the early 1970’s. The panel is an NHB panelboard and is rated for 100A at 277/480V, 3-phase, 4-wire. The panel is in fair condition based on age and use. Panel BL feeds the following: basement lighting, parking lot lighting, building exterior lighting, and panel “BP”. The panel has (1) 70A, 3-pole spare and (3) single pole circuit spaces. Panel “BP” is the power panel for the basement equipment and is a 120/208V, 3-phase, 4-wire panelboard of the same vintage as panel “BL”.

The step-down transformer that feeds panel “BP” is located directly below panel “BL”. Per NEC article 110.26, working clearances must be maintained around all electrical equipment that may require “examination, adjustment servicing or maintenance while energized”. In this case, the transformer encroaches into the 42” deep x 30” wide x 78” tall working space required for panel “BL” and panel “BP”. This code requirement was established before the original construction so this would have been a code violation when it was installed, therefore it would not be considered for “grandfathering” by local code enforcement.

Recommendations: At this time, panel “BL” and “BP” are in operable condition and there does not appear to be an imminent likelihood of the equipment failing. However, the equipment is almost 50 years old and in fair condition so accordingly, the Owner should start considering whether to replace the panel. We would put this task in a 5-year maintenance schedule.

The transformer needs to be relocated to allow adequate working clearance for Panel “BL”. The existing transformer is approximately 50 years old and also in fair condition and can remain in service. However, since it will need to be relocated this may be a good opportunity to replace the unit.

Panel "1L"

Condition: Panel "1L" is fed from the 3rd main breaker in the "MDP" and is the main lighting panel for the 1st floor. Under the original construction, the feeder to panel "1L appears to have been tapped to feed the lighting panels on the mezzanine and 2nd floors (panels "ML" and "2L"). In addition, a 480V to 120/208V, 3-phase, 4-wire, step-down transformer (located above the ceiling) is fed out of the lighting panel for each floor and feeds a power panel for general-purpose outlets and other 120V loads (Panels "1P, "MP" and "2P"). Panels "1L, "ML", and "2L" are similar in type and vintage to panel "BL", as are panels "1P", "MP", and "2P" to panel "BP". All panels are in fair condition

Since the building was constructed, several 120/208V, panels have been added to the system in subsequent remodel work and fed from panel "SDP", including Panels "1P-2", "1P-3", and "2P-1". Panel "IP-2 is a 100A, 30-circuit GE A-Series panelboard with transient voltage surge suppression (TVSS) and appears to have several spares. Panel "1P-3" is a 100A, 42-circuit Cutler Hammer PRL1a panelboard with TVSS and 25 circuit spaces. Panel "2P-1" is a 100A, 30-circuit Cutler Hammer PRL1a panelboard with TVSS and 11 circuit spaces. These panels are in good condition.

It was reported that there have been several overloading problems with the general-purpose outlet circuits. Several of the problems have been attributed to the used of electric space heaters by the building occupants. Based on the NEC article 220.12, the load calculation for general lighting and receptacle load for an office building of this size should be 165 kVA or 200A, at 480V. The existing feeder to panel "1L" is rated for 225A, at 277/480V, 3-phase, 4-wire. The original feeder for the general lighting and receptacles appears to have been marginal for the current functions. With the panels that have been added, there appears to be enough power for the general-purpose loads. However, presumably the original branch circuits have more receptacles per circuit than the circuits installed later and are most likely the cause of the overloaded circuits. More circuits could be added to split up some of the more troublesome circuits, in order to maintain smaller loads on all circuits.

Panel directories are required by NEC article 408-4. The directories for original panels appear to be out of date and several of the directories for the newer panels also appear to be out of date. All circuits should be investigated and current circuit descriptions should be added to the panel directories.

Recommendations: At this time, panel "1L", "ML", "2L", "1P", "MP" and "2P" are in operable condition and there does not appear to be an imminent likelihood of the equipment failing. However, the equipment is almost 50 years old and in fair condition, accordingly the Owner should start considering whether to replace the panel. We would put this task in a 5-year maintenance schedule. Panels "1P-2", "1P-3", and "2P-1" are in good condition and can remain as-is for many more years.

We recommend identifying the circuits that have tripping problems due to overloading. The number of outlets on these circuits should be reduced, especially if there are several electric heaters plugged into the circuits. To do this properly, receptacle outlets should be removed from the circuits in question and new circuits added to reconnect the removed receptacles. Otherwise, additional circuits could be provided for electric heaters in the distressed areas and the heaters removed from the questioned circuits.

Finally, an account of all electrical circuits should be undertaken and panel schedules should be updated with descriptions of the actual equipment connected.

“PMCC”

Condition: The penthouse motor control center is fed from the 4^{th} main breaker. The MCC is from the original construction and is a GE IC 7700 Line. The MCC is of early 70’s vintage and is in poor condition. We have heard complaints about GE equipment of this vintage and the difficulty in getting spare parts.

Recommendation: At this time, PMCC is in operable condition and there does not appear to be an imminent likelihood of the equipment failing. However, it is in poor condition and many other clients have expressed difficulties in getting spare parts for similar equipment. Therefore, we suggest the owner starts looking at replacement of the equipment. We would put this on a 3-year maintenance schedule.

“BMCC”

Condition: The basement motor control center is fed from the 5^{th} main breaker. The MCC is from the original construction and is a GE IC 7700 Line. The MCC is of early 70’s vintage and is in fair condition. We have heard complaints about GE equipment of this vintage and the difficulty in getting spare parts.

Recommendation: At this time, BMCC is in operable condition and there does not appear to be an imminent likelihood of the equipment failing. However, it is in fair condition and many other clients have expressed difficulties in getting spare parts for similar equipment. Therefore, we suggest the owner starts looking at replacement of the equipment. We would put this on a 5-year maintenance schedule.

“SDP”

Condition: SDP is fed from the 6^{th} main breaker. The feeder to SDP is fed from a 150A, 3-pole breaker. Panel SDP serves Panel “X”, Panel “Y”, Panel 1P-3, the computer room panel, the UPS, amongst other loads. The panel is a Square D NH1B panelboard and appears to have been installed in the 1990s. The equipment is in good condition, as is the equipment fed from SDP. There are some minor maintenance issues (Panel “X” has a missing breaker knockout) but otherwise this part of the system is in good order.

Recommendations: Panel “SDP” and the equipment that it serves is in good condition and can remain as is for many more years. Maintenance of these systems should be provided and any code deficiencies should be corrected.

<u>Lighting</u>

Condition: The existing lighting systems consist mostly of linear fluorescent fixtures the original T8 lamps have been replaced with LED retrofit lamps. The fixtures for the most part are surface-mounted parabolic style that we would estimate are from the late 1990s or early 2000’s. The fixtures are in good condition, but the technology is out of date. Substantial energy savings could be achieved with a lighting and controls retrofit. For the most part, the lighting levels appear to comply with the IES recommendations. Areas that fell short of IES recommended levels were generally small and if concerns arise, the lighting levels could be increased with the use of small task lighting fixtures. There also are many circuits of recessed can lighting that are currently not used.

Recommendations: Although the lighting in general is in good condition and operating effectively, a lighting retrofit could provide energy savings.

Emergency Lighting and Exit Signage

Condition: The existing emergency lighting is accomplished using “bug-eye” style battery packs. For the most part, the units appeared to be properly spaced. There were a few locations, especially in the basement, that proper lighting levels for emergency egress were not met.

Most of the exit signs are photoluminescent style. The signs are not powered, but require that a minimum of 5 foot-candles be present on the surface of the sign from the building illumination. In many locations, this level of lighting does not meet the 5-footcandle requirement. Additionally, there is a maximum of 75 feet of viewing distance to legibly read the signs and in some cases this distance was exceeded.

Also, in the basement there were some self-illuminated exit signs. Many of these signs did not have a replacement date marked on them. Of the ones that, did we found 10/2020 as the replacement date so there is a good chance that most of the signs will be at the end of their rated life in a couple of months.

Recommendations: We recommend adding bug-eye emergency lights as necessary to meet 1-foot candle minimum average lighting levels along the path of egress, per IBC 1008.2.1. Otherwise, if a lighting retrofit is pursued, we recommend using battery-powered drivers in the standard fixtures to provide egress illumination.

We recommend providing additional lighting to illuminate the photoluminescent exit signs, and to make sure that these lights do not have local control so they remain on when the building is occupied (i.e. nightlights). Otherwise, they should be replaced with another technology. The self-illuminated exit signs that are at the end of their life should be replaced.

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Telecommunications

Condition: Condition of the telecommunications system was not requested and was not reviewed.

Fire Alarm System

Condition: The existing fire alarm system is in operable condition and appears to have been last tested in November of 2019. The system appears to be relatively new and in good operating condition.

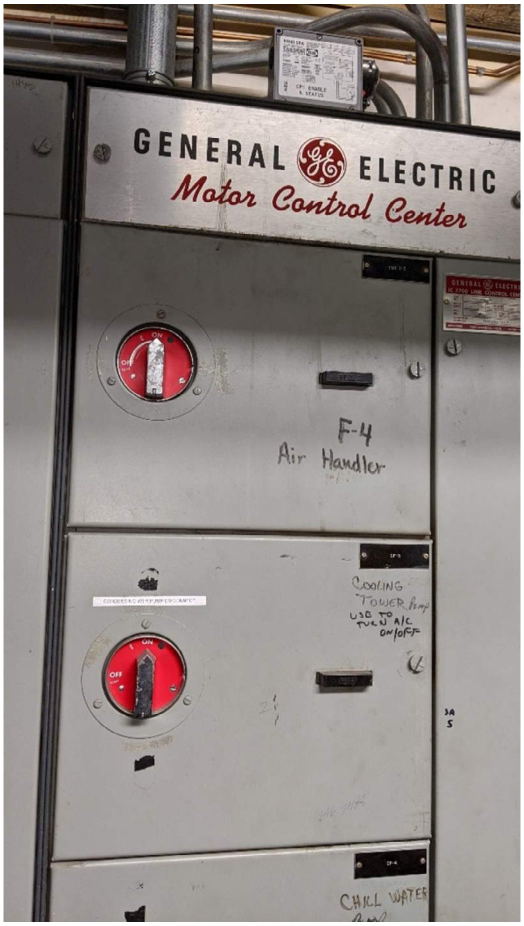
Recommendation: We recommend maintaining yearly inspection and repairing any deficiencies noted in the inspection report.

MDP in Basement Electrical Room

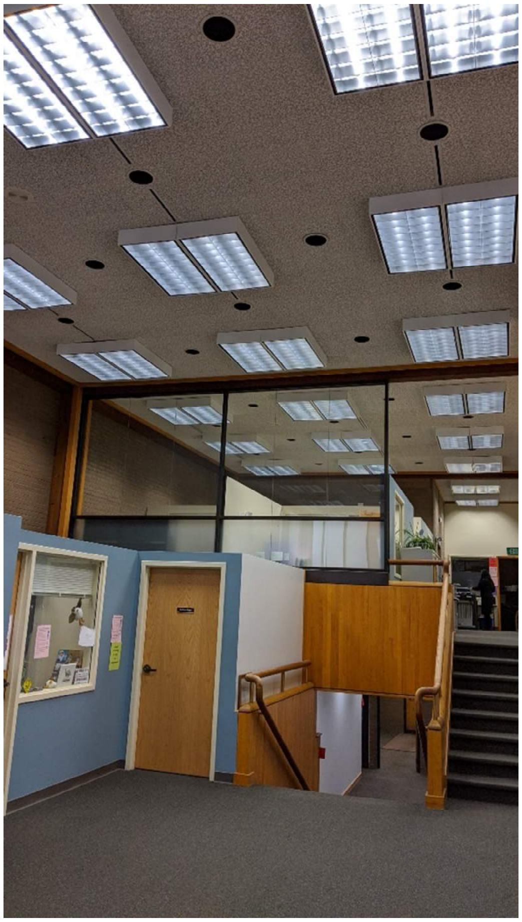
Panels “BL and “BP” with transformer to be relocated

Panels 1L, 1P, 1P-2, and 1P-3

Penthouse Motor Control Center



Basement Motor Control Center



General Office Lighting

Emergency Bug-eye and exit sign.

Photoluminescent Exit Sign

Self-luminous exit sign expiration


Main Fire Alarm Panel

STRUCTURAL

PND Engineers, Inc. (PND) performed an on-site structural inspection of the existing building at 813 W Northern Lights Blvd on August 18, 2020. During this visit, existing construction and structural elements were examined for any visible signs of deficiency or distress.

Referenced Codes

2012 International Building Code (IBC)
ASCE 7-10

1. Facility Description

The two-story building with a mezzanine between the first and second floor as well as a basement originally constructed around 1972. The structure is a combination of a concrete beam and slab system, concrete masonry unit (CMU)/concrete walls, and wood and steel framing. The as-built structural drawings for the building were not available. Limited architectural, mechanical, and electrical drawings were provided by the owner. Due to the lack of existing documentation, analysis and recommendations are based on visual observations. Much of the structural system was obscured from view by finishes.

a. Foundation: The foundation consists of combination CMU and concrete stem walls assumed to be on strip footings.

b. First Floor Framing: The first-floor framing, shown in Photograph No. 1, contains 16x14 concrete beams spanning 19 feet framing to concrete girders of the same size spanning 12 feet. The girders are supported by CMU/concrete walls on either end. The floor is made of a concrete slab, shown in Photograph No. 2. These girders are supported by CMU and concrete walls.

c. Mezzanine Framing: The framing at this level, shown in Photograph No. 3 consists of 5.75x19 glue-laminated beams (GLB) normal to the girders that span 28 feet at 7 feet on center framing to 8.75x28 GLB at 26 feet on center. The GLB are supported by timber columns on each end. There are also 2x8 joists running between the beams.

d. Second Floor Framing: The second-floor framing was not visible during the inspection. The architectural drawings show wood beam and column framing to support wood sheathing.

e. Roof Framing: The roof framing was not visible during the inspection. The architectural drawings show a combination of wood and steel to support a steel deck. The steel deck has slab part of it, to provide a floor for the mechanical penthouse above. The concrete on deck is supported by steel joists; whereas the portion of the deck not topped with concrete is supported by wood framing.

f. Mechanical Penthouse: The penthouse roof framing is constructed of steel joists at 5 feet on center spanning 28 feet. Walls are made of light gauge steel studs sheathed with 5/8” gypsum wall board (GWB) on the interior side and ½” GWB on the exterior side.

2. Structural Condition

   a. Structural roof and floor framing, where visible, appeared to be in good condition. The structural floor framing for the first and second floors were designed for approximately 70 psf live load and show no apparent signs of damage or failure. Ceiling nonstructural components, shown in Photograph No. 5, are in good condition and don't appear to need any additions/modifications made to them.

   b. The basement floor slab contained few 1/8" cracks, likely due to minor shrinkage of the building over time and do not represent a structural or foundation issue. Both the CMU and concrete walls at this level were in good condition as well, with only hairline cracks that don't compromise the structural integrity of the system.

   c. The CMU walls were in good condition with an exception of a single location near the plan west third floor stairwell, shown in Photograph No. 6. These large diagonal cracks were likely caused by shear failure around the door opening.

   d. The seismic lateral resisting system (SLRS) of the building is unknown. As previously noted, as-built structural drawings were not available. It should be noted that during this inspection there was limited access to certain areas and some of the building elements were not visible. However, with the exception of the CMU wall failure described above, the building seemed to have performed adequately during the November 2018 earthquake.

3. Recommendations

   a. Veneer in south stairwell may repaired by demolishing the damaged veneer brick and replacing in kind. Note that upon demolishing the veneer, the CMU behind the veneer should be checked for any signs of damage: cracking, exposed reinforcement, etc. If damaged, the CMU should be repaired prior to replacing the brick veneer.

   b. Due to the age of the structure and multiple construction types, multiple deficiencies in the lateral resisting system are expected. These would include roof and floor diaphragm continuity, connections between diaphragm and CMU walls and seismic collectors for a complete lateral load path.

      Therefore, we recommend that a more complete structural inspection and analysis be performed. If structural drawings cannot be located, removal of finishes and development of as-built information would be required.

4. Conclusion

   Building structure appears to be in good condition. It performed adequately during the 2018 earthquake with the exception of veneer/CMU shearwall at south stair tower. The veneer on that area should be removed, CMU inspected, and then veneer replaced in kind. A more in-depth analysis is recommended for the SRLS due to the potential deficiencies for the age of construction.

Photograph No. 1

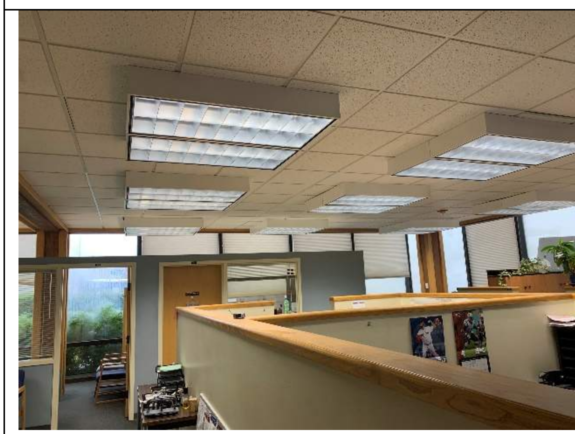
<u>Description:</u> Basement framing

Photograph No. 2

<u>Description:</u> Basement floor

Photograph No. 3

<u>Description:</u> First floor/mezzanine framing

	**Photograph No. 4** **<u>Description:</u>** Second floor framing
	**Photograph No. 5** **<u>Description:</u>** Typical light fixtures and ceiling tiles
	**Photograph No. 6** **<u>Description:</u>** CMU wall damage

Capital Items
Alaska Industrial Development and Export Authority
Sunbeam BLK 3 LT 1A
2019-2020

Equipment	Est. Age	Average Life Exp.	Est. Replacement Date	Est. Cost
Heating, Ventilation, & Air Conditioning				
Boiler -Weil-McLain (2)	1	25-35	2044-2054	$ 215,000.00
Fin-Tube Heaters (Baseboard)	20	25	2025	$ 30,000.00
Chiller Replacement	3	15-20	2031-2036	$ 147,500.00
Pumps, Base-mounted	3	20	2037	$ 14,000.00
Fan 4 (Supply)	15+	15	2020	$ 44,000.00
Mechanical Room Relief Fan VFD's	21	20	2019	$ 25,000.00
Fan 2 (Supply)	10	15	2025	$ 42,000.00
Fan 1 (Supply)	15+	15	2020	$ 46,000.00
Fan 3 (Return)	25+	25	2020	$ 46,000.00
Roof Top Unit (Boardroom)	1	20	2039	$ 12,000.00
Heat Rejection Fan (Cooling Tower)	20	30	2030	$ 45,000.00
VAV Boxes (43 count)	10	20	2030	$ 21,500.00
Air Separator addition	n/a	n/a	2020	$ 4,000.00
Plumbing				
Water Heater, Hot Water	5	15	2030	$ 2,030.00
Piping	varies	40-50	2025-2030	$ 100,000.00
Control System				
DDC System	3	15	2032	$ 200,000.00
Valve Actuators (25 count)	15+	15	2020	$ 8,750.00
Electrical				
Main Distribution Panel	46	50	2024	$70,000
Elevator Electrical Feed*	46	50	2024	$30,000
Panel BL**	46	50	2024	$30,000
Panel 1L***	46	50	2024	$30,000
Penthouse Motor Control Center (PMCC)	46	50	2024	$45,000
Basement Motor Control Center (BMCC)	46	50	2024	$70,000
Panel SPD	30	50	2040	$30,000
Lighting (LEDs) Lamp Replacement	1	10	2029	$60,000
Lighting Fixture Replacement	20	40	2040	$380,000
Emergency Lighting	20	30	2030	$32,000
Exit Signage	20	20	2020	$12,500
Fire/Life Safety				
Fire Alarm Panel	10	20	2025	$100,000
Structural				
Roof Replacement	2	15-20	2032-2037	$ 160,000.00

Notes:
* electrical associated with an elevator modernization
** cost for BL & BP
*** per floor costs for: 1L & 1P; ML & MP; 2L & 2P