Facility Evaluation

of

Plumbing, Heating, Ventilating, Air Conditioning, and Electrical Systems

for

Project:

“Old” ProBuild Corporate Center
West 5th Street
Winona, MN

Prepared for:

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PLUMBING SYSTEMS

Water Service and Distribution:

Water is supplied from the city utilities in West 5th Street. An 8 inch water service enters the building just above the first floor. A 2 inch galvanized steel domestic water service is tapped from this 8 inch main. Past that point, the water supply reduces to a 4 inch for fire protection duty.

In general, this water service is in fine condition. It does not appear that this water service is original to the building construction. Since the fire sprinkler service is only 4 inch in size, this water service was likely installed when the basement level was remodeled at some point. The basement floor level is fully equipped with a fire sprinkler system, but the remainder of the building is not. Had the entire building been fire sprinklered, a 6 inch fire sprinkler service would likely have been required.

Sprinkler protection for basement levels was a common installation to comply with certain building and fire codes under previous building codes. Under current practice, the entire building would likely require fire sprinkler protection.

If full building sprinkler protection is desired, or required under a future renovation, additional zones of fire sprinkler piping could be installed with relative ease.

Although the domestic water piping between the 8 inch water service and the meter is galvanized steel, the vast majority of domestic water piping visible in the basement is copper. This piping is in very good condition and well constructed. Most of the piping is insulated with modern rubber insulation.

Note there is no bypass valve and piping around the water meter. Normally a commercial meter of this size would have a manual bypass valve to maintain water supply to the building during routine water meter replacement.

The 2 inch water service and water meter seem appropriate for this building. There are numerous toilet rooms in this building and most of the water closets (toilets) and urinals are flush valve style. Under currently plumbing Code, the water supply should probably be 2-1/2 inch at the supply point, but the system likely works fine as is.

Water distribution piping visible in the basement appears to be not original and generally copper material. Very little copper piping has any insulation, regardless of whether conveying hot or cold water. The following photograph shows copper piping in the old boiler room.
The water distribution piping on the upper floors is generally concealed within wall cavities and plumbing chases, but we presume most of that piping is original to the building construction and galvanized steel in material. The following photograph shows newer copper piping connecting to older galvanized steel piping.

This photograph is located in the basement level near the boiler room. Two items of concern are clearly visible in this photograph.

First, it appears that the original domestic water piping was well insulated, but insulated with asbestos-containing materials. Second, the newer copper piping was joined directly to the original galvanized steel piping without any dielectric fittings. New bronze ball valves were installed at the connection point, but bronze-to-galvanized steel connections do not eliminate the need for dielectric protection.

Dielectric protection is basically an insulating material to provide two dissimilar metals from direct contact. When normal domestic water flows past a metal-to-metal connection, a very slight electrical charge is created. This electrical charge can cause minerals in the domestic water to separate out of the water stream and adhere to the galvanized steel piping. Over time, this will cause the galvanized steel piping to plug and to rust from the inside, as free oxygen also gets trapped in this mineral build-up.

Presumably any future use of this facility will require renovation of the main public toilet rooms. When that occurs, new water supplies should be extended directly from copper mains in the basement. We would discourage continued use of any galvanized steel piping for an extended duration.

Sanitary Drain and Sewer:

The majority of the observed sanitary drainage and vent piping appeared to be original and constructed of cast iron with bell and spigot fittings.

Since most of the toilet rooms on the upper floors are original, the drainage system has seen little modification. There are small renovations on the basement level where PVC drainage and vent pipe were used.

Despite the age of the piping, we did not observe any leakage or evidence of leakage. We assume the drainage system still operates adequately.

The piping is well-supported and well constructed. Clean-outs exist as one would expect for a building of this era. Although it may be prudent to replace this piping with any significant remodeling effort, this system of piping may operate fine for many more years.

We believe the sanitary waste drains to West 5th Street in the same vicinity as the water service.
Storm Drain and Sewer:

Rainwater on the roof is collected by conventional roof drains and conveyed inside the building vertically to the municipal storm water sewer system.

The roof drains appear to be in good condition and certainly have been replaced during roof membrane replacement activities.

This building is a full parapet design causing all rainwater to be retained on the roof and conveyed to one of 4 roof drains. Under modern building code, a secondary drainage system would be required to protect the building in the event the stormwater system plugged and rainwater began to accumulate on the roof. Most buildings are not designed to support any substantial accumulation of water on the roof.

Many buildings of this era have no such overflow path, but this building does. As can be seen in the photograph above, there is a 3 inch hole drilled through the parapet and open on both sides. This hole would allow any accumulation of rainwater, due to a plugged roof drain or rainwater system, to spill through the parapet and fall outside the building to grade below.

There is an overflow hole adjacent to each roof drain. Although the net area of these holes probably does not meet current Code, it certainly provides a significant safety factor for the protection of the building and its occupants.

The rainwater piping inside the building is somewhat concealed in the building construction. We could not follow the rainwater leaders throughout the building, but believe they drain individually to the ceiling of the basement, and then horizontally to a single discharge point.

Presumably the rainwater drainage piping is cast iron with bell & spigot fittings. We did not observe any damage or any conditions that would indicate this system is not working properly.

Fixtures and Equipment:

The toilet room fixtures within this building are both a “high” point and a “low” point.

Most of the fixtures appear original to the building construction. They were obviously “top of the line” when installed and remain in very good condition. These fixtures have great architectural character and coupled with the marble finishes in the toilet rooms, almost form a museum quality experience.

But, none of the toilet rooms are ADA-accessible and there is virtually no way to convert any of the toilet rooms into ADA-accessible spaces without complete replacement. The fixtures themselves are not ADA-compliant. And, of course, none of these fixtures have any water conserving features.
There are some newer plumbing fixtures on the lower level and break room sinks are newer.

The few electric water coolers located in the building were not original, but added many years ago with “minimal” plumbing effort. These installations are “illegal” under current plumbing Code.
In general, most of the plumbing fixtures within this building are very interesting, very good quality and still quite functional, but probably not salvageable for re-use if the building is renovated for a modern occupancy.

**Water Heating and Treatment:**

It appears that all domestic hot water is generated by a single, electric, “residential” heater located in the boiler room.

Adjacent to the heater is a residential water softener that softens domestic water before heating. Although this equipment “seems” small for this building, the only requirement for domestic hot water are the toilet room lavatories and a couple break room sinks.

Both the softener and the heater appear to be in satisfactory condition and appeared to be functional. The heater has been installed in recent years, as evidenced by the energy use decal on the side of the heater.

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PLUMBING SYSTEMS RECOMMENDED CORRECTIVE WORK

Corrective work of all plumbing systems is somewhat a matter of the scope of any renovation. Most of the plumbing systems within this building are very old and probably original to the building construction.

The building is supplied with an 8 inch water service. This immediately breaks up into a 4 inch water supply to the fire sprinkler system serving the basement level, and a 2 inch water service supplying the domestic needs of the building. So, we have plenty of water supply in the building and the supply is from the Winona municipal system.

The domestic water supply piping is a mixture of old galvanized steel and newer copper. On the lower level, much of the water supply piping is copper with new, rubber insulation. On the upper levels, the toilet rooms are still original and the water piping is almost certainly original galvanized steel. We did not observe any leaks or other indicators that this piping has become a problem. If significant renovation is undertaking, we would recommend replacement of the old galvanized steel piping with new.

We did observe asbestos-containing insulation on both water supply piping and storm water drainage piping in the boiler room. It is likely that the domestic water piping on the upper levels is insulated with asbestos containing materials. If left un-disturbed, this insulation may continue to serve its purpose for many more years.

If toilet rooms are remodeled, we would recommend a budget of $3,000 per “toilet room area” for removal of asbestos-containing pipe insulation. This is an estimate based on previous history, and without knowledge of exactly what may be concealed in the existing structure at this facility. A “toilet room area” would be, for example, one set of toilet rooms in close proximity on one floor. (Basically, this is set up, glove-bag removal, tear down, disposal, and testing for a typical asbestos abatement project.)

The single observed water heater is located in the boiler room. It is a residential, electrically-operated heater. Hot water is softened prior to heating and there is a hot water re-circulation pump. This equipment all appears to be in good condition and suitable for continued use in an office-type occupancy. Should the demand for hot water grow with the new use of the building (such as showers or food service), a new domestic hot water plant would be required.

The toilet rooms on the upper floors all appear to be original. None meet current ADA standards. The fixtures were obviously very high quality when installed and have significant character. There appears to be no reason to replace these toilet rooms, except for ADA-compliance or simply a “new look”. We operated a few fixtures and they seemed to work well.

Should one want to replace toilet rooms, we would recommend an average budget value of $2,000/fixture (regardless of the type of fixture). This will cover good quality new fixtures with good quality trim, and replace both water supply piping and sanitary drainage/vent piping in the immediate area of renovation.

Although not a plumbing topic, the upper floors of this building are NOT protected with a fire sprinkler system. The basement appears to be fully sprinklered. Since the water supply is already installed and of adequate size, and the basement level is equipped with a fire sprinkler system, it may be advantageous to expand fire sprinkler coverage to the remainder of the building, even if not required by Building Code. A cost range of $2.50 - $3.25 / square foot should be an adequate allowance.
Roof rain water is conducted with internal roof drains. We observed no problems with these systems (although they are mostly concealed in the construction) and there are overflow paths on the roof should these drainage systems become plugged.

In general, although the plumbing systems are getting old, they are in acceptable condition and could continue to function for many more years “exactly as is”. Plumbing renovations should be driven by the need/desire for renovation.

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HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS

Heating Plant and Distribution System:

There are, essentially, two heating plants in this building. The primary heating plant is a single, very old fire tube boiler producing low pressure steam.

This is an old Pacific-brand boiler probably original to the building construction. The boiler was operated with coal at one time, but has since been converted for use with natural gas. The gas burner was installed in one of the fuel loading doors. This is not an ideal installation, but very common with the old “locomotive-style” boilers.

The maintenance staff reports that this boiler is lacking some operating and safety controls that need to be installed prior to continuing use of the boiler.

The entire boiler plant is “marginal”. The boiler feedwater unit is just a small condensate receiver.

The problem with such a small vessel for use as a boiler feedwater unit is that the system, on start-up, evaporates much water into steam. The boiler feedwater unit pumps additional water into the boiler, but quickly runs out of water as there is a significant delay before the steam condenses in the building and drains back to condensate receiver.

To protect the boiler, additional city water is introduced to supply lacking return water. This water requires more chemicals and introduces more oxygen into the piping system.

Once the system begins to equalize, the condensate starts returning at a rate equaling the evaporation rate. When that occurs, the receiver floods and spills hot, chemically treated water into the sanitary drainage system. Energy and chemicals are just wasted out of the building.

It also appears that boiler chemicals are “shot fed” into the condensate receiver. Steam boilers require continual chemical treatment to control the water balance which in turn allows the steam to efficiently evaporate and protects the piping and inside of the boiler.

Ideally, chemicals should be smoothly fed into the system only as necessary. At this building, the maintenance staff must continually make guesses on how much chemical to add, and then add a significant quantity into the condensate receiver. It takes many cycles of steam evaporating and condensing before these chemicals are uniformly mixed with the boiler water. During that time delay, the chemicals can harm the steel boiler and piping almost as much as the lack of chemical treatment.

It should also be noted that this boiler has a tall vent stack with barometric damper to control the draft through the boiler. This was necessary when the boiler was operating on coal and a good natural draft was needed to allow the coal to burn efficiently. Now, burning gas, this tall stack results in significant energy losses both when the boiler is operating, but mostly when the
boiler is “off”, but hot.

Steam from the boiler plant is piped to old cast iron steam radiators.

As was commonly done, cast iron radiators are generally located directly in front of windows. This design does result in a comfortable building as the radiators offset any cold air cascading down from the window glass.

It appears that all of the radiators are “two-pipe”, meaning one piping network supplies steam to the radiators and a second piping network returns the condensed steam back to the boiler as water. This is a good means of distributing steam, as compared to older “one pipe” systems where steam and water flowed in the same pipes, but in opposite directions.

Most of the steam radiators have been fitted with self-contained temperature control valves. These are automatic valves which regulate the steam flow into the radiators to maintain a fixed room temperature. Originally, the radiators were all manually controlled.

These valves generally work well and are fairly accurate at maintaining room temperature, but there is no means to incorporate night temperature setback. The only practical way to reduce room temperature during unoccupied periods would be to measure temperature in a few representative locations and simply cycle the boiler “on and off” to maintain a reduced building temperature.

This is not an accurate control strategy and generally not an efficient means to operate a steam heating plant, especially one with an under-sized boiler feed water tank.

Although it may present some comfort issues, we would have to recommend that this steam heating system be either abandoned and/or removed, or converted to hot water use. The old steam boiler has well-surpassed its useful life and production of steam is simply inefficient for this building.

As an alternative, the old radiators could be retained for both comfort, as well as historic value, and supplied with hot water. These radiators can be easily converted for water use with minimal modifications. It may be advantageous to replace the supply and return piping, but the existing steam and condensate piping could be mostly salvaged and converted to water use if desired.

If the radiators are retained and converted to hot water use, they should be fitted with electrically-operated control valves so that a proper night setback energy control scheme could be implemented.

**Air Conditioning and Ventilation Equipment**

This building has been retro-fitted with a number of ducted mechanical systems served with residential furnaces or packaged rooftop units. This also serves as the “second” heating plant in the building. In nearly every case, the equipment serving the ducted systems has gas heating capabilities.

It is likely that this newer equipment was added for air conditioning use, but purchased with heating capabilities as the added cost would have been minimal and would provide some back-up for the single steam boiler.

Generally, ducted air conditioning systems
inherently meet the heating needs of most buildings if they are sized for the comfort cooling needs. That is certainly the case in this building, but, these systems may not be particularly comfortable.

The supply air (cooling and heating) is distributed into the space from ceiling diffusers and high sidewall grilles. Return air is also located in the ceilings. As this was a grand building when constructed, the ceilings are much higher than commonly done in modern buildings. The net result is that the rooms may be at a correct temperature when measured at the normal 48-54 inches above floor level, but the floors (where the people are primarily located) are likely 4-8 degrees cooler due to the cold air falling down along the exterior walls and windows and then flooding the entire floor level.

When a building operates in this manner (many do), the occupants have to increase the room temperature to be comfortable in their normal work space. This increases the energy consumption of the building.

As stated earlier, these ducted systems were likely added to primarily provide air conditioning. It appears that the building had no mechanical cooling when originally constructed. The equipment varies in age, design concept, and location.

In the lowest level, residential furnaces were used, coupled to air conditioning units sitting on grade outside.

There are two (2) sets of “twinned” furnaces located in the lowest level. Based on the venting design, two of these furnaces appear to be 15-20 years old while these Bryant furnaces, with PVC venting, are likely less than 10 years old.

Each set of furnaces is coupled to residential air conditioning units located on grade outside the building.

The upper levels of the building are cooled and ventilated with packaged rooftop units, some actually located on the roof and some on stands as can be easily seen from the ground.
The “rooftop” units are different brands of equipment and presumably were installed as separate projects. All equipment appears to be less than 20 years old. We did not observe any of the equipment in operation, so we cannot comment on their operating condition.

The units on the roof are Trane equipment and as can been seen in the above photographs, are installed on “adapta-curbs”. This would indicate that a previous rooftop unit was installed at these locations originally and have been replaced with Trane equipment. The thermostatic controls on the upper level remain “Carrier-brand”, which would indicate the original units were Carrier. The units on the stands visible from the ground are Carrier brand.

The Trane units are labeled “2002” and presumably installed in 2002 or early 2003. The maintenance staff indicated there were operational problems with these units, but they appeared to be in good condition and any operational problems are likely temperature-control related or easily corrected.

In general, these rooftop units are single zone, constant volume units but there are numerous thermostats on each floor. On the upper level, for example, there is a cooling thermostat in each Executive office. This would indicate there is some type of zoning system installed. Zoning systems on packaged rooftop equipment don’t always work well. This may account for the maintenance staff’s comments regarding operational problems.

For a single zone, constant volume system to operate with zone dampers and multiple thermostats, a bypass damper must be installed to ensure the same quantity of air flows through the rooftop unit at all times. As the zone dampers close, the bypass dampers open to protect the rooftop unit. These systems can work okay if designed and installed correctly, but many have a poor reputation.

**Exhaust Ventilation Systems:**

As this building is entirely an office occupancy, the only requirement for building exhaust is toilet rooms. We suspect the exhaust system may require some improvements.

The building is equipped with two (2) old gravity ventilators that likely served the exhaust systems, by natural convection, originally. One of the gravity ventilators now has a metal gas vent penetrating it. We are unsure of the source of the exhaust vent.

Most of the toilet rooms have been fitted with mechanical “Broan-type” exhaust fans. It is unknown where these fans discharge. Ideally,
the old gravity ventilation ducts have been “sealed” and the Broan toilet room fans discharge into this exhaust ductwork system. When any renovation system is considered, these exhaust systems should be considered for replacement.

**Temperature Controls:**

The temperature control systems within this building are “unitary” in nature. The steam boiler simply operates to maintain a constant steam pressure. The steam radiators have been equipped with self-contained, thermally-operated valves as described earlier in this report.

The air conditioning systems are fitted with multiple, modern, low voltage thermostats. There are no old pneumatic systems, as one might expect, and there is no modern, central energy management system within this building.

This building is large enough to benefit from a central energy management system. Depending on whether the existing rooftop units are retained or not, a new temperature control system would be recommended for improved comfort, better control of energy consumption, and the ability to optimize equipment use and building temperature programming.

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HVAC SYSTEMS – RECOMMENDED CORRECTIVE WORK

The steam boiler and all related equipment in the boiler room should be removed and discarded. The boiler has well exceeded its life expectancy, has some Code-based shortcomings at the moment, and certainly is not an efficiency heating system. **Budget $15,000.00 to remove the boiler and all related equipment from within the boiler room only.** The chimney should be capped at the top as part of this work.

The entire building has been retro-fitted with forced air equipment consisting of (4) residential furnaces and (4) packaged rooftop units. These units were most likely installed for mechanical cooling purposes, but the systems were wisely fitted with gas heat. So, it appears the entire building can be heated with these forced air systems.

The forced air systems; however, serve high ceiling areas in the upper floors and supply air and return air grilles are at the ceiling. The occupied spaces may not be “comfortable” using the forced air systems. It would probably be a better option to install some return air grilled near the floor in spaces where people may be stationary near exterior walls.

The existing steam heating system is a 2-pipe system. The system could be converted to hot water with water circulating through the existing cast iron radiators. This modification would cost some significant money and may result in leaks in the cast iron radiators. At this time, we would not recommend this course of action. If the building is significantly remodeled, in whole or in part, and the new Owner desires some exterior hot water radiation for enhanced comfort, new perimeter hot water radiation could be added at that time.

**For budgeting purposes, assume:**
- **$25,000** for a modular, hot water heating plant.
- **$4.00/square foot** (in the remodeled areas) for a light commercial baseboard radiation, simple piping and room thermostat controls.

The rooftop equipment appears to be in satisfactory condition and no deficiencies were observed, but the systems were generally not in operation. **We would recommend a budget of $2,000 to have a service company make a thorough inspection of all furnace and rooftop systems, replace air filters, check and/or adjust the gas controls, and clean the condensing unit coils with a water wash procedure.**

The building currently has a dedicated computer room with a separate split system cooling unit. This system does not appear to have any heat (but may have an internal electric coil). If this room remains a computer room/date hub, no work is required. But, if this room wants to be converted to an occupied office, it may require new HVAC. **If so, budget $1,000 to obtain supply air from an adjacent rooftop system.**

The temperature control systems currently installed on the furnaces and rooftop units are unique and “stand alone”. They likely function fine, but may not have automatic un-occupied schedules. Should a sophisticated building Owner, such as WSU, take ownership of this facility, they may wish to convert the control system to a true, building-wide energy management system. **If so, we would recommend a budget of $50,000 for an energy management system (such as the Trane Summit at WSU) to control the furnaces, condensing units, rooftop units, and zone dampers currently installed in this building.**

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ELECTRICAL SYSTEMS

Service and Building Distribution:

The electrical service and most of the electrical distribution within this building is very new, heavy duty and in very good condition. The existing service and distribution system should be able to support most new occupancies and uses of this building.

The main electrical service is located in the Boiler Room on the lower level. The electrical gear is a custom “AMP-brand” switchboard rated at 1,200 amps (120/208 VAC, three phase, four wire).

The switchboard is dated 2004. The main switchboard contained integral TVSS protection.

In an adjacent room off the Boiler Room is a large gang of new panelboards.

These are true “panelboards”, heavy duty, and well done. All visible conduit in this area is EMT or rigid steel. All equipment shows current inspection certificates and required labeling and warning.

This building is equipped with a gas-fired emergency generator. A 200 amp automatic transfer switch is located in the Boiler Room adjacent to the electrical service.

The generator is located on grade just outside the boiler room. (Below the rooftop unit on the stand.)
The generator was installed to serve the computer room located within this building. It appears that very few general building loads are connected to the emergency generator. The generator was obviously intended to keep the computers running for the UBC lumber yards during a power outage in Winona. We are unsure if any of the building lighting is connected to this emergency power system.

In general, the electrical distribution system is in very good condition and suitable for many more years of service.

Contrary to the high quality of the main electrical service equipment and installation, we are a little concerned about the actual power supply to the building. Power is supplied to the building by Excel Energy from three (3) pole-mounted transformer located very close to the building.

While this work is neatly done, the conduit used is PVC (appears to be Schedule 40 PVC). As can be seen in the photograph, vehicles can get quite close to this conduit. It would have been better to run these conduit in rigid steel conduit to give some added protection against physical damage. At this point, it may be advisable to construct some type of steel cage to protect the conduit within 6 feet of grade.

On the upper levels of the building, the original panelboards have been replaced with new panels in the same location. It appears that new conductors have been pulled in existing conduit as best possible. Most of the panelboards on the upper levels are “Load Centers” to fit within existing cabinets that originally housed old fuse panels.

Many of these panels are not as new as the electrical service equipment. It would appear that the building has undergone a couple electrical improvement projects within the last 25 years.
Wiring Means and Methods:

Much of the branch circuit wiring has been replaced within the last 15-25 years. All major feeders and branch circuits observed in the basement were routed in EMT conduit.

On the upper levels, new surface-mounted raceway (Wiremold) has been used extensively to add additional receptacles in the workrooms and offices.

Wiring to the original receptacles, as well as the original lighting fixtures, is concealed in the structure or behind finishes and was not disassembled to determine the age of the wiring in the old conduit systems. It does appear that all electrical systems were installed in conduit, including the original construction.

As would be expected, we did observe minor electrical wiring violations, such as missing or open junction boxes and inadequately supported conduit. In general, these violations are minimal and easily corrected.

There are electrical code violations, based on current Code, regarding ground fault receptacles, etc. There are relatively easy to correct and would be done inherently with a substantial renovation project.

Lighting:

Lighting on the basement level is almost entirely 2’x4’ recessed troffer with prismatic lenses. The fixtures appear to use T8 lamps and seem to be in good condition. In some areas, new partitions have been constructed without modifying the ceiling grid, light fixture layout, or switching. In these areas, some improvement in fixture location and switching is recommended.

Switching on the lower level is very basic, with generally a single switch and single light level per room. The single level lighting control and prismatic lenses are not an ideal environment for heavy use of computer screens. Depending on the future use of the basement, it may be warranted to replace lighting fixtures and switching in key areas.
On the upper levels are contrasting lighting systems. In the lobby, main corridors, and executive spaces, the original lighting fixtures appear to remain. These are very decorative fixtures and fit the spaces nicely. Lighting levels; however, are marginal and all these fixtures presumably use incandescent lamps. Switching is minimal, with generally all lighting in a single room on a single switch, or row switching in large spaces.

Lighting levels, coupled with the large exterior window area, is very good, but the ability to control lighting levels is poor. Switching is limited. As can be seen in the above photograph, the windows are equipped with blinds, but they are not optimum for light level control.

Like the basement, these lighting fixtures are poor for computer use with no directional control and directly line of sight to the lamps.

On the remainder of the upper floors, lighting was obviously replaced within the last 20 years or so. Lighting in the “non-Executive” office spaces is generally suspended fluorescent “wraparounds”. We believe these fixtures use T8 lamps.

In general, it is time to update and replace all lighting fixtures, systems, and switching in this building.
Receptacles and General Use Power:

As noted previously, it appears that a substantially electrical project was undertaking 15-20 years ago to add receptacles and data jacks. This work was obviously done to support the use of computers within the individual office and large work spaces. All of the new receptacles are 3-wire with Code-compliant grounding.

Despite the renovation, receptacle spacing and quantities are still marginal. The new receptacles were generally located where surface raceway could be routed without having to work around radiators and other obstacles.

A thorough review for GFCI-protected receptacles should be performed as this building is renovated. GFCI-protected receptacles are required in numerous locations, including all receptacles in the basement, receptacles near plumbing fixtures in toilet rooms and kitchenettes, all exterior receptacles, and other locations. The Code requirements for GFCI-protected receptacles change frequently.

Life Safety Systems:

There is no fire alarm systems within this building. There is still probably no Code requirement for such, although the elevator will need an Elevator Recall Panel when/if it is updated to modern operation.

No automatic smoke detection system was observed.

Exit lights are generally missing or marginally located. All new exit lights must be equipped with battery-backup power supplies or connected to the emergency power system.

Emergency egress lighting is also minimal or deficient. No exterior emergency egress lighting was observed to be present. Emergency egress lighting should be provided new with the proposed renovation work. The basement is fitted with some battery-powered emergency egress lighting. We tested a random sample of units. Some worked and some did not.

Again, it would seem logical to connect some fixed lighting to the emergency power system for emergency egress lighting.

Only the basement level is currently equipped with a fire sprinkler system.

Communications Systems:

The building was renovated to include significant computer wiring in previous years. It appears that the generator was added in 2004, at which time the current computer room was likely added. Some of the computer wiring in the remainder of the building; however, does appear to be older than that.

All current computer wiring does use modern Ethernet distribution with Category V cable.

This wiring can likely be re-used, but a new occupant may wish to upgrade to Category 6 standards.

There are no other intercom or security systems currently installed within this building that appear to be operational.

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ELECTRICAL SYSTEMS – RECOMMENDED CORRECTIVE WORK

The electrical systems in this building are generally in very good condition. The electrical service appears to have been replaced in 2004. The new service equipment is very good quality, installed well, and suitable for main more years of service.

The main is rated at 1,200 amps (280/120 VAC, three phase, 4 wire) which seems more than adequate for this building. The service is equipped with TVSS protection. Conduit is generally new EMT and installed well.

The building is also equipped with an engine-driven generator which was apparently installed solely to serve the computer room. The generator appears to be in very good condition and could be used for building life safety needs, if the computer loads are not significant with the new Owner/occupancy.

It appears that all of the original panelboards have been replaced with new “load centers”. The load centers are a residential product, but more than adequate for the needs of this building. It appears that most of the conduit, and perhaps all of the conductors have been replaced.

In general, we have no corrective work we recommend be done to the electrical distribution system.

Lighting and convenience power have been modified within the last 10 years. With the exception of some original, decorative fixtures, the lighting has been replaced with fluorescent fixtures. Lenses are generally prismatic. Switching is very simplistic – typically a single switch per room. Although the lighting systems could certainly be used as is for many more years, we would recommend that lighting system be replaced and enhanced as renovation is performed. A more-modern fluorescent lighting scheme may be desirable, and the large quantity of windows would certain dictate more lighting control.

Since circuitry is already in place, we would recommend a budget allowance of $4.50/square foot for new lighting fixtures and new/additional switching in rooms/spaces when renovation is performed.

The building should get new emergency egress lighting. The building is currently equipped with battery-powered emergency lighting units. We tested some of these and found a few non-functional or “weak”. These units typically have a 10-12 year life span and are probably at or near this point. We recommend a budget of $12,000 to replace all battery-powered lighting units and add additional units to meet current Building Code.

Receptacles will require updating based on the proposed new use of the building. In general, the building has plenty of receptacles, but many are surface-mounted with “wiremold” and many are not located at ADA-height. There is no reason to replace any receptacles at this time.

The building has much computer wiring that may be salvageable. The cabling is 8 conductor Ethernet, but probably Cat 5. Again, data cabling should be updated as the building is renovated. The new Owner may want to budget $1.25/square foot for initial new data wiring to accommodate early building occupants.

The building does not have a fire alarm system, but there is no requirement currently to have one. If the building remains an office occupancy, there is probably no advantage to installing a fire alarm system. It would be better to expand the fire sprinkler system.

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