BUILDING ASSESSMENT

of the

NEWTON PUBLIC LIBRARY

720 North Oak
Newton, Kansas 67410

Consultants

Hans J. Fischer, AIA
Consulting Architect
4 Colonial Court
Lawrence, Kansas 66044

Myron C. Reed, P.E.
Reed Engineering
9045 SW Burch Road
Wakarusa, Kansas 66546

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EXECUTIVE SUMMARY

Building Description:
The Newton Public Library currently contains about 23,899 gross square feet; 10,380 on the lower level, and 13,509 on the main floor. The original 1972 building has a full basement, and is constructed with a reinforced concrete frame supporting a roof of pre-stressed concrete joists with masonry infill exterior walls. The 1980 addition has no basement, is constructed with masonry bearing walls, sloped steel joist roof framing, and steel roof deck with composite insulation board under the roofing membrane. The roof structure of the original building is flat, with slight slope achieved with a lightweight concrete fill.

Architectural Systems:
Building Exterior Envelope – Window wall units, with spandrel panels above and below single pane clear glass, exhibit deterioration and displacement of glazing gaskets. Seals on several double glazed units are broken. Both window walls and adjacent brick cavity walls are poorly insulated. Precast concrete fascia and column covers have open joints. Exposed steel lintels have rusted. The ground surface is too near the south window wall, causing water damage and leakage into the building in the past.

Roof – Slope changes have been made, and gutters added, to the roof of the original building in an attempt correct inadequate drainage. The roof of the 1972 building addition is in poor condition, with numerous bubbles and other deterioration in evidence. Roof insulation is inadequate.

Building Interior – Stairway riser heights and the distance between railings exceed the dimensions allowed by current codes. The east stairway up from the children's area is not enclosed as required by code, which potentially interferes with safe exiting. Clearance above to elevator may not meet requirements of the current elevator code. Lighting varies from inadequate to poor in adult book shelf areas due to the low (8'-5") ceiling. The main floor of the library is generally unattractive and uninviting.

General Deficiencies – Exterior masonry walls are not well designed in that moisture can permeate insulation in the cavity between the exterior and interior wythes of brick. On the lower level, a mechanical room wall should be extended to the underside of the floor above as required by code. And, storage is not permitted in mechanical rooms. The current book return near the front entrance is a fire and vandalism hazard and should be removed.

Functional Assessment:
To keep pace with major changes in library services and technology since the library was built in the 1970's, a number of changes and building additions were made over the years. The type, location, and size of these modifications were necessarily and significantly affected by the original configuration and location of key building elements (stairs, elevator, restrooms, mechanical rooms, etc.) The overall result has had, in many cases, a negative impact on the ability of the library building to function efficiently and to provide optimum service to the public.

To adequately provide for the library's **current** services, staff, collection, furniture, fixtures, and equipment, a building about 5,000 square feet larger than the present library would, according to current standards, be required.

Among the most obvious functional deficiencies are (1) the remote location of the meeting room requires that attendees at meetings travel through the entire main floor of the library. (2) There is only one small, unisex restroom adjacent to the meeting room. The only other public restrooms (also small) are located on the lower level. To reach these restrooms, meeting attendees must again cross the main library floor and take the elevator down or, walk down the east stairway and cross through the children's library. (3) The principle stairway providing access to the children's library is located adjacent the main library entrance, but is steep, narrow, and uninviting. (4) The separation of administrative functions on both floors of the library hampers effective operations. (5) Additional administrative space is needed (6) Storage space is inadequate and, in some cases, poorly located. (7) The north door has no vestibule for weather protection. (8) Vehicle parking for major library functions is inadequate. (9) The slope of the front entrance walk exceeds ADA standards. (10) The young adult area, located on the main floor level is inadequate; and, the youth services coordinator is located on the lower floor.

Accessibility:

The present elevator is too small and is not in compliance with the ADA. Stairway handrails, railings, as well as some door hardware, and signage do not meet the ADA. An ADA-required "rescue assistance area" is required at the bottom of both public stairways for protection and exiting of non-ambulatory persons when the elevator is inoperable during an emergency. Installation of power-assisted doors at public restrooms should be considered.

Heating, Ventilating, and Air-Conditioning Systems

The HVAC system equipment items are mostly about five years of age and appear to be in generally good condition; however, the exhaust fans appear to be original.

An area of concern that deserves further attention in the near future is the relatively low combustion/heat transfer efficiency of the boiler. If the future price of energy escalates more rapidly than the future cost of replacing the boiler, it might be prudent to consider replacing the boiler within the next ten years or so.

Extra care with the chemical treatment of the heating and cooling water systems with special emphasis on the open water system of the cooling tower is recommended for equipment longevity and occupant safety. It does not appear feasible to replace the cooling tower with an air-cooled chiller. Rather, it would be better to install a remote receiver tank to allow faster and/or easier response by the cooling system to unexpected hot weather.

Some parts of the system exposed to the weather, such as pipe insulation, show significant degradation. After replacement, and with ultraviolet protection added, longer life of the new insulation can be expected. Old duct is typically replaced rather than modified for new arrangements. However, where existing duct is in the correct arrangement it may remain.

Electrical Systems:

The electrical power supply system is, for the most part, the same age as the original building. The main electrical system appears to be adequate and has the spare capacity for some future expansion. With regular maintenance, the main equipment should be adequate for future use.

In order to achieve the recommended third tier of protection, an additional TVSS [Transient Voltage Surge Suppression] device is recommended for the main service. As is now typical for older libraries, the originally installed convenience outlets are no longer sufficient in number or location to meet the current needs of either library staff or patrons.

Lighting:
Lighting is mostly fluorescent with T8 lamps, which are of reasonably high efficiency and should give good service. Some of the fixtures have been damaged by water and should be replaced after roof work is completed. Original emergency egress lighting is still in place and additional units added. Exit lighting with battery backup is also installed. Maintenance personnel stated that the emergency egress/exit lighting units are tested regularly and replaced as needed.

Plumbing Systems:
The plumbing system is, for the most part, the same age as the original building and appears to be in good operating condition, except for several small items. Backflow occurs from time-to-time through the floor drains. Backwater valves are recommended to solve this backflow problem.

Telecommunications and Information Systems:
The only issues noted on the telecommunications system were some needed fire-stopping and proper ground bonding.

Fire Alarm:
The fire alarm system is configured for full coverage of the library, with remote notification stated to be operational. Duct smoke detectors on the air handling units have recently been replaced.

The fire alarm control panel is a very good unit for this application. However, it has reached the age where it is considered obsolete due to difficulty in getting some replacement parts. Therefore, replacement is recommended when the next major work is performed on the building, or when the system can no longer be kept fully operational. Whichever of these two situations occurs first should trigger the replacement of the entire fire alarm system.

Energy Efficiency
Energy efficiency of mechanical and electrical equipment, and appeared to be generally good except as noted for the boiler. When any equipment items are replaced, energy efficiency of the replacement equipment should be one of the first aspects considered in order to keep the library operating at its most efficient level.

Energy efficiency should also be considered when replacing electric motors. There is a significant difference between high efficiency and standard efficiency motors. Rapid payback can be expected if is done at the time when increased maintenance warrants replacement.

Proper chemical treatment of the HVAC water systems is essential for good, efficient operation, as well as longer life of equipment, piping, and related components.

LIBRARY HISTORY and GENERAL BUILDING DESCRIPTION

The present Newton Public Library began as a semi-private library known as the "Ben Franklin Library," organized by Miss Clara Rand, who moved from Chicago to accept a teaching position in Newton. In 1885 several community groups, led by the local chapter of the WCTU, began soliciting funds for a library, and on May 25, 1885, a permanent organization was formed. After the Kansas Legislature, in 1886, passed a measure granting second class cities the right to levy a tax for support of a library, an election was held in Newton, which passed. The library was established as the Newton Free Library and Reading Association. On September 27, 1886, the Newton Library Association passed its stock and furnishings to the Newton Free Library. A local committee requested a grant from Andrew Carnegie to build a library, to which he responded, on May, 1902 with an offer of $10,000 (later increased to $15,000. The new library, located at Second and Main opened officially on March 14, 1904. The building was design by W. W. Rose, a Kansas City architect who also designed the Kansas building in the 1904 St. Louis World's Fair.[1]

Community interest for a new library building began in 1962, but voters twice turned down bond issues; on May 8 and November 6, 1962 elections. On April 19, 1966, the city commission voted to levy a one-mill tax to accumulate funds for a new library. The levy was to be for 10 years or until $275,000 was accumulated. On April 6, 1971 voters approved the use of Military Park for the new library site. The State Library offered $53,431 in Library Services and Construction Act, Title II funds for the new building, which was matched with $291,324 in local money. The library moved into their new building in April 1973.[1]

The building was designed by Wichita architects Carmichael – Wheatcroft Associates. Several changes and additions to the building have been made since then:

1975	Children's Room on lower level
1980	Children's Library addition
1995	Control desk and workroom remodel
1998	Lower level renovation for young people's and junior department Florence Bessmer meeting room remodel
1999	Unisex, men and women restrooms remodel
2005	Unisex restroom and Bessmer office remodel after sewage eruption

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[1] Gardiner, Allen "The Carnegie Legacy in Kansas"

1. Architectural Systems

1.1 Building Exterior Envelope

1.1.1 Triple section, aluminum frame window units, extending from the floor up to the underside of a precast concrete perimeter fascia, were typically utilized in both the original library building and the 1980 addition. The larger center sections of these units contain gasket-glazed fixed, non-insulating, (in the original building) solar gray glass. The upper sections of the aluminum frame window units, and in some cases, the lower sections, contain gasket-glazed, fixed spandrel glass with a 1 inch, foil-backed, fiberglass insulation backing. In several locations, operable, in-swinging hopper sash, have been installed in the lower section. Exterior insect screens are installed on the hopper sash.

1.1.2 Numerous glazing gaskets exhibit deterioration, displacement, and wear.

1.1.3 At the original building, there are no overhangs to shade windows. Considerable energy loss occurs through non-insulating glass, and through minimally insulated glass spandrel panels. During cold weather, considerable heat loss occurs and condensation occurs on the interior of the glass causing library occupants to experience discomfort when near these window units. (See Section 4 of this report.) During hot weather, and at times when direct sunlight strikes the windows, excessive heat gain is experienced. In the 1980 addition, seals on several large double-glazed, insulated windows appear to have been broken.

1.1.4 Steel angle lintels, where exposed on the exterior, exhibit rust accumulation.

1.1.5 On the 1980 addition, vines have been allowed to grow over several masonry walls, precast concrete columns, fascias, and window screens.

1.1.6 Movement of precast concrete fascia units and columns has opened joints between many of the units. Openings in joints between the fascia, columns, and adjacent masonry walls is also evident. Sealant has apparently been applied in the past to seal joint openings. However, there are locations currently in need of repair.

1.1.7 Attempts have been made in the past to address drainage problems and leaks along the south window wall by the addition of metal sills.

1.1.8 Metal fascia alterations have apparently been made in the past, and gutters and downspouts added, to facilitate roof drainage. There is evidence that some roof overflow has occurred. The ground surface appears to slope towards the building perimeter in several areas, causing surface water to flow against the foundation, and in some cases up to the bottom of the aluminum framed window units.

1.1.9 Sealant damage and deterioration at the basement wall louver in the south areaway has occurred. The areaway contains trash. An exposed cable runs into

the areaway from underground. Furthermore, the grating over the areaway is not secured and can be lifted, creating a potential safety hazard.

1.2 Roof

1.2.1 The library has two major roof areas: the original building and the 1980 building addition. Construction drawings of the original building show the roof structure to be pre-stressed concrete joists spanning about 25 feet between concrete beams. The structure is flat. Roof slope was achieved by installing a lightweight concrete fill over the pre-stressed units that sloped to 6 interior roof drains. The slope, subsequently discovered to be inadequate, was apparently changed to drain to the building perimeter. At this time a new roofing surface, as well as gutters and downspouts, was apparently added, and interior roof drains were inactivated. Although the roofing on this building unit appears in fairly good condition, it may be prudent to take one or more cuts of the roof membrane to verify its condition.

1.2.2 According to the construction drawings, the roof of the east, 1980 addition is of steel frame construction. Steel joists bear on a steel beam and an exterior masonry wall. The roof deck consists of a 1-1/2 inch metal deck, covered with 2-3/8 inch composition insulation board and a built-up roofing membrane. The roof was designed with a level perimeter edge that drains towards two interior roof drains, located near the northeast and southeast corners. Roof drains of this type often require frequent attention to keep them clear of leaves and other material that can cause clogging. One of these drains has been damaged and should be replaced.

1.2.3 Since leaders for the interior roof drains run above the ceiling, it may be prudent to verify whether this piping is insulated. If not insulated, condensation could form on the piping when cold water from the roof enters the warm building, and leak onto the ceiling.

1.2.4 The roof expansion joint between the original building and the addition shown on the construction documents has since been modified. It has been covered with roofing membrane apparently when re-roofing was done. Consequently, the initial purpose of this joint; to allow for movement between the two structures has been compromised.

1.2.5 The roof over the building addition is in very poor condition. Bubbles in the roofing membrane are numerous and severe. Some joints in the roofing membrane are being pulled apart by the bubbles. Although not visible without cutting through the roof membrane, roof insulation has likely been damaged by moisture. At roof-mounted equipment, patches have aged and bituminous patching material is cracked and pulling up the surface of the roofing. Caulking repairs have been made to some of the roof penetrations.

1.2.6 Energy savings could accrue if both roof areas were better insulated.

1.3 Building Interior

1.3.1 The 2003 International Building Code (IBC), adopted by the state of Kansas, requires that stair risers not exceed 7 inches in height. According to the construction drawings, risers on all stairways in the building are 7-1/4 inches high, thereby creating a steeper climb.

1.3.2 Railings at the east stairway contain openings between vertical and horizontal elements that the exceed 4 inches required by the IBC. This condition places children at risk at one of the stairways leading to and from the children's library.

1.3.2 Security at the lower level exit from the children's library to the east stairway is unsatisfactory. Current codes may require that this stairway be fully enclosed at both floor levels. Since there is no door, smoke from the lower level could enter this stairway and interfere with safe exiting from the first floor to the exterior.

1.3.5 Current elevator codes require minimum clearances to the structure above the elevator cab. Existing clearances should be checked and compliance verified.

1.3.6 The main floor ceiling is about 8'-5" above the floor. Therefore, the top of standard 90 inch tall adult book shelving is only 11 inches from the ceiling. Consequently, lighting of bookshelf areas varies from inadequate to poor. If a standard top canopy were added to the book shelves, this situation would be worsened. The potential for removing and reconfiguring portions of the present suspended ceiling should be explored.

1.3.7 In general, the main floor of the library is unattractive and uninviting. Much of the interior décor retains a 1970's atmosphere. New interior finishes could brighten the library considerably.

1.4 General Deficiencies

1.4.1 Construction documents depict exterior, 12 inch thick walls of brick masonry, with an insulation-filled space (cavity) between the inside and outside wythes of brick. The insulating value of this arrangement is well below current standards. Undoubtedly, utility costs are negatively affected. As with the roof, providing additional insulation for walls would result in significant reductions in energy loss.

1.4.2 Construction details, showing flashing and weep holes at the bottom of the masonry cavity walls, are intended to allow moisture behind the outer wythe of brick to exit through the weep holes. However, with insulation filling the cavity, moisture is more likely to permeate into the insulation rather than exit the cavity. But, without undertaking some minimal destructive testing, it is not possible to determine whether this has occurred.

1.4.3 The wall between the lower floor south mechanical room and the adjacent work room should be extended to the underside of the floor above as a sound and smoke barrier.

1.4.4 Remove/replace the present book return; it is a fire and vandalism hazard.

2 Functional Assessment

2.1 Major changes in library services and technology have occurred since the library was first built in the early 1970's. Over the years, a number of additions and modifications were made to the building to accommodate to these changes and to the increased use of the library by the community. The type, location, and size of these modifications was necessarily and significantly affected by the original configuration and location of key elements in the building (stairs, elevator, restrooms, mechanical rooms, etc.) The overall result has had, in many cases, a negative impact on the ability of the library building to function efficiently and to provide optimum service to the public.

2,2 As is borne out by the Needs Assessment (see appendix), to provide for the library's **current** services, staff, collection, furniture, fixtures and equipment, would require a building about 5,000 square feet larger than the present library.

2.3 One of the primary functional deficiencies of the library building is the remote location of the meeting room from the main entrance. All who enter and leave the meeting room (capacity, about 50 persons) must travel through the entire main library space. This essentially creates a corridor which, when occupied by entering and departing meeting room attendees, interferes with other functions underway in the library. This arrangement also makes it impractical to use the meeting room except during normal library operating hours.

2.4 Also, there is only one small, single-occupancy, unisex restroom in close proximity to the meeting room. Consequently, when a break occurs in a large group meeting, those using the restroom must again traverse the entire main library space to the elevator located near the northwest corner, and thence to the lower level where the main restrooms are located. Or, they could go to the lower level via the stairway near the meeting room, and then cross through the children's library to the same restrooms.

2.5 The principal stairway providing access to the lower level children's library is located adjacent to the main library entrance facing North Oak Street. This stairway is steep and narrow. (See Section 1.3 Building Interior.) On the other hand, the secondary, primarily emergency exit stairway from the lower level, is much more open and attractive. However, due to its remote location, it is infrequently used for access to the children's library on the lower level.

2.6 While the children's library is an attractive area, several of its spaces lack adequate visual control or supervision from the circulation desk.

2.7 The separation of some administrative functions between the main and lower floor levels is detrimental to efficient operations even though staff have become accustomed to working with this arrangement. Personnel frequently walk through the lower floor administrative space to enter the adjacent board (meeting) room. The stairway leading from the main floor administrative area to the lower floor is steep and narrow. Additional office and administrative space is needed.

2.8 Although there are several storage spaces in the building, they are not well located. In some areas, access to these rooms is awkward. For example, one must go through the children's library to enter the lower level storage rooms at the south wall. A portion of this space also houses mechanical equipment; codes normally require that mechanical rooms be separated from storage spaces. Overall, more storage space is needed.

2.9 Access to the lower floor space currently allocated to genealogy is either through the children's library or through an adjacent (meeting) space, separated by a folding door.

2.10 Work space behind the main circulation desk and in the adjacent work room is inadequate in size and arrangement.

2.11 Better accommodations to staff needs, such as storage for coats, boots, umbrellas, and other personal items could be provided.

2.12 The policy of the library to retain periodicals for extended periods of time has resulted in the allocation of large amounts of space for this purpose.

2.13 There is no vestibule or other weather protection at the north door (staff entrance). If deliveries are made at this entrance, there is no apparent location for temporary storage of received items until they can be processed. If deliveries are made through the main west entrance, items must be carried through public spaces.

2.14 The slope of main entrance entry walk (ramp) exceeds the ADA standards, and should have railings for persons needing assistance.

2.15 It is not clear where large numbers of vehicles can park when group meetings are held at the library during normal operating hours. Adequate parking for staff was not identified.

2.16 The Young Adult area is located on the main floor, while the office space for the youth services coordinator is apparently located on the lower level

2.17 There are no computers in the Young Adult area.

3. Accessibility

General Information

3.1 Standards for accessibility are published in the Code of Federal Regulations issued by the Department of Justice in 28 CFR Part 36 and entitled *Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities*. (Commonly referred to as the ADA) Some exceptions to the standards may apply to alteration work if compliance is "technically infeasible". The regulations define "technically infeasible" as meaning "an alteration of a building or a facility that has little likelihood of being accomplished because existing structural conditions would require removing or altering a load-

bearing member which is an essential part of the structural frame; or because other existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility". (See Appendix A for Section 4.1.6 excerpted from the standards.)

Until the actual design of modifications to the library building is undertaken, the extent to which exceptions to the regulations might be allowed (if any) cannot be determined.

3.2 While an exhaustive analysis of all accessible elements and spaces in the library building was not conducted, the following conditions were noted.

3.2.1 The elevator system is not in compliance with the ADA. Dimensions of the present elevator cab are 46" x 64", while the ADA requires minimum inside dimensions of 51" x 68" for a single door elevator or 51" x 80" for an elevator with center parting doors. Other components of the elevator system require modification to meet ADA requirements, including hall lanterns (visible and audible signals), door and signal timing, tactile, braille and visual control indicators, and others per Section 4.10 of the regulations.

3.2.2 Hand rails at the stairway adjacent to the west entrance are not in compliance with the ADA in that they exceed the required maximum 1-1/4 to 1-1/2 inch width dimension.

3.2.3 Non-complying door hardware should be modified or replaced with accessible, ADA-compliant hardware.

3.2.4 Installation of automatic operating, or power-assisted doors at public restrooms should be considered.

3.2.5 An ADA required "area of rescue assistance" should be installed at the lower level entrance to both public stairways. Each such installation should provide required signaling and communications devices so that non-ambulatory persons can summon assistance to exit the building when the elevator is inoperable during an emergency.

3.2.6 In the children's library, the base cabinet unit containing a sink with bubbler has a 36 inch high countertop. The ADA requires a maximum height of 34 inches. As a practical matter, if intended for use by children, the countertop should be even lower.

3.2.7 ADA-compliant signage should be provided throughout the library, with adequately sized lettering and raised, braille characters and pictorial symbols.

3.2.8 Not all restrooms are fully ADA-compliant. They should be modified or expanded to comply with applicable requirements.

3.2.9 The circulation desk in the children's library is not readily accessible for persons in wheelchairs per ADA requirements.

HVAC [Heating Ventilating & Air Conditioning] Systems:

4.1. Roof:

4.1.1. The roof portion of the HVAC, Heating, Ventilating, and Air-Conditioning, system consists of a cooling tower, two relief hoods, exhaust fan, fresh air intake, and two roof-mounted direct expansion split cooling systems.

4.1.1.1. Both of the aluminum roof-mounted relief air hoods appear to be in good condition. They relieve air to prevent accumulation of excess building pressure.

4.1.1.1.1. Although they have stayed in place until now, the hoods should be fastened a bit more securely to their curbs by the use of two or more additional screws each.

4.1.1.2. The roof exhaust fan EF#1 Addn. (Loren Cook #12UC11D, 115VAC 1-phase) serves the lower level addition restroom. The exhaust fan has far exceeded its expected useful life.

4.1.1.2.1. The exhaust fan should be replaced.

4.1.1.3. The fresh air intake hood should be modified to reduce moisture intake with the fresh air.

4.1.1.4. The boiler flue extends only about 1.5' above the roof; however, this appears to be approximately in accordance with the original design.

4.1.1.5. The roof-mounted Unit #1 is a 10 ton split system air-cooled condenser.

4.1.1.5.1. Manufactured in 2003 this unit appeared to be in good condition; it has approximately 10 more years of expected useful life.

4.1.1.5.1.1. This unit utilizes R-22 refrigerant which will be phased out of production by year 2020. Therefore, the refrigerant should be available throughout the expected useful life of this unit.

4.1.1.5.1.2. The vibration isolation pads are in a much deteriorated condition and should be replaced.

4.1.1.5.1.3. The refrigerant piping insulation is deteriorated and should be replaced. Replacement insulation should be coated with an ultra-violet resistant coating.

4.1.1.5.1.3.1. The roof penetration seal of the refrigerant piping has deteriorated and should be replaced.

4.1.1.6. The roof-mounted Unit #2 is a 2 ton split system air-cooled condenser.

4.1.1.6.1. Manufactured in 2002 this unit appeared to be in good condition; it has approximately 9 or 10 more years of expected useful life.

4.1.1.6.1.1. This unit utilizes R-22 refrigerant which will be phased out of production by year 2020. Therefore, the refrigerant should be available throughout the expected useful life of this unit.

4.1.1.6.1.2. The refrigerant piping insulation is deteriorated and should be replaced. Replacement insulation should be coated with an ultra-violet resistant coating.

4.1.1.6.1.2.1. The seal of the roof penetration of the refrigerant piping has deteriorated and should be repaired or replaced.

4.1.1.7. The cooling tower shows signs of deterioration. It is 13 years old and has an expected useful life of about 15 years.

4.1.1.7.1. The condenser water piping has exterior surface rust; however, failure of the piping will occur in most cases from the inside out.

4.1.1.7.2. The interior of the piping could not be observed, however, the tower fill was observed. The tower fill showed signs of very heavy fouling in the recent past. This raised concerns of Legionella, however, maintenance personnel indicated the situation was now under control.

4.1.1.7.2.1. An aggressive approach to water treatment should continue to give reasonable assurance that an excessive Legionella infestation will not occur. This will also give the best probability of getting the full useful life from the tower, because a chemically dirty and biologically active tower is also more subject to corrosion.

4.1.1.8. Budgeting for tower replacement in two or three years is recommended. As noted in the water treatment, it may be possible to extend the tower life a couple years more than expected with careful watching of the tower treatment. At the time of tower replacement the piping should be carefully checked for level of interior corrosion with selective destructive testing. Total pipe replacement may be needed.

4.1.1.8.1. There have been questions raised about switching to air-cooled equipment for easier maintenance. This is probably not feasible because the relatively new chiller was built as a water-cooled unit and can not be readily converted to air-cooled. Air-cooled chillers do give better energy efficiency performance. Therefore, a change to air-cooled is not recommended.

4.1.1.8.2. There is the possibility of installing a remote basin [an added inside or outside underground tank] for the tower to allow it to come on-line quickly and easily in un-expected hot days during generally cooler weather. This typically would be in the intermediate weather of early spring and late fall when the ability to switch over to cooling would greatly improve the building comfort.

4.2. First Floor

4.2.1. The exhaust fan EF#1 serves the first floor restroom, janitor's closet and receiving. The exhaust fan has far exceeded its expected useful life and should be replaced.

4.2.2. The control system is by T.A.C. T.A.C. [a Schneider Electric company] is a micro-processor based building automation and control system that monitors the library energy use and controls the room temperatures along with the ON-OFF cycles. It is an open, standards-based technology with the capability of central monitoring and/or control of heating and cooling, access control, security monitoring, ventilation, fire and smoke control, and lighting. There were no problems noted with the control system.

4.2.3. Condensation occurs on some of the windows in cold weather, which poses a maintenance problem. One method of solving the problem is to keep the humidity level above the dew-point temperature of the cold surfaces. Most humidification systems have difficulty holding the relative humidity at the proper set-point or adjusting the set-point to compensate for the lower dew-point when outside temperatures are lower. This can be done with proper controls and/or appropriate heat sources for warming the cold surfaces.

4.2.3.1. The condensation problems on the windows can be lessened by improving the U-factor of the windows and increasing the air flow across the windows.

4.2.3.2. The present system utilizes hot water fin-tube radiation under the windows which moves the heated air up across the windows in spots where the grilles are located; however, the overhead supply air moving down tends to counter the upward flow off the fin-tubes.

4.2.3.2.1. It is recommended that the air system be modified to move additional air down the windows to increase the interior surface temperature of the new windows.

4.2.3.2.2. Also, it is recommended that the control system be modified to automatically reset the relative humidity level to a safe set-point based on the outside air temperature.

4.2.4. The supply and return ductwork and diffusers/grilles which remain after modifications are made should be checked and cleaned.

4.3. Lower Level

4.3.1. The exhaust fan EF#2 serves the lower level floor restrooms. The exhaust fan has far exceeded its expected useful life and should be replaced.

4.3.2. The boiler is a 2003 Weil-McLain LGB-8 which provides hot water as the heat source for heating the entire building.

4.3.2.1. It is tagged KS #47791H and according to the Kansas Boiler Inspector's office it has no known deficiencies, and none were noted in the building walk-thru.

4.3.2.2. Supplemental combustion air is provided by an outside air fan that is interlocked with the boiler burner.

4.3.2.3. It appears that this boiler has an energy efficiency of 70% at full load, and it has a very high heat loss in the standby mode.

4.3.2.3.1. In the future when this boiler is replaced a boiler with a much higher seasonal efficiency should be considered.

4.3.2.3.2. The boiler has an expected useful life of approximately 20 more years; however, a payback analysis should be performed in the next 10 years to see if it is appropriate to replace it at that time with a high-efficiency unit.

4.3.2.3.3. A carbon monoxide detector is recommended for the lower level in the boiler area. It would be tied to the fire alarm system.

4.3.3. Cooling is provided for most of the building by the chiller [Multistack Model #MS50Z6A2W]. This unit was installed in 2003 and is a reasonably efficient unit that should give good service life. It should have 15 years of useful service life remaining.

4.3.3.1. The closed loop chilled water system should be checked yearly, and every time it is opened to ensure the chemical treatment is adequate to prevent corrosion and keep the heat transfer capability at optimum.

4.3.3.2. The chiller heat is rejected through the roof-mounted cooling tower.

4.3.3.3. Operating efficiency can be assisted by keeping the condenser tubes clean through good tower water management and regular cleaning of the tubes. Proper chemical treatment is critical to the life and efficiency of the chiller. Also, running low condenser water temperature is usually a means of obtaining the highest overall system operating efficiency.

4.3.4. Humidification in winter weather provides comfort to occupants and if kept constant provides for more reliable operation of paper handling items such as copiers and printers.

4.3.4.1. Constant humidity levels also provides for increased life of the books.

4.3.4.2. An Armstrong Series HC 4000 humidifier installed on the east end of the multi-zone air handling unit provides moisture into the unit hot-deck for wintertime humidification, and it appears to be in operable condition. It has an expected useful life of another five years or so.

4.3.4.3. At air handling unit #4 an Aprilaire humidifier is installed for providing winter space humidification for the areas served by this air handler.

4.3.4.4. This humidifier is about 6 years old and probably has another 5 years or so of useful life remaining.

4.3.4.5. A disadvantage of adding humidity in winter weather is condensation on the inside surfaces of window panes, frames, and similar exterior building envelope items. If the humidification system is not properly managed, this can cause damage to adjacent trim items and floor coverings.

4.3.5. It is likely that high summertime relative humidity in the lower level is an issue. This can usually be resolved by running the air handling unit fan continuously during highly humid weather.

4.3.6. The building hot water heating and chilled water pumps appear to be the original pumps. They are well beyond their expected service life and they should be replaced with new units for greater reliability and for ease of getting new parts.

4.3.7. The chemical feed system should be reviewed with the chemical supplier to insure it is properly treating the water systems. The condenser water system is an open system and needs particular care to get the best efficiency and useful life out of the cooling tower and chiller.

5. Electrical Systems:

5.1. Roof

5.1.1. The cooling tower disconnect switch appears to have a damaged wire on Phase B [Blue Wire]. This should be repaired.

5.1.2. Add a convenience outlet at the cooling tower to allow removal of the semi-permanent extension cord used for the heat trace on the tower water piping.

5.1.3. A service drop for the locomotive cover building and area yard light goes over the SE Corner of the library roof about 2' above the roof. This is contrary to the National Electrical Code (NEC). This is something to be aware of and be cautious about when working on the roof. It is not an item that can be easily changed at this point unless a pole is added in the yard.

5.1.4. A lightning protection system is recommended according to the National Fire Protection Association [Standard #NFPA-780] for the library building.

5.2. Grade Level

5.2.1. The building is supplied by an underground electrical service, which feeds from a pad-mounted transformer adjacent to the building on the north side near the center.

5.2.2. This service is 3-Ø (3-phase), 4 Wire, 600 Amp, 120/208 VAC (volts alternating current). No service problems were noted.

5.2.2.1. The peak demand shown on the meter mounted on the transformer case was about 56 KW which is about 155 amperes; however, the annual peak for 2007 was about 75KW which gives peak amperage of 208. When the power factor is considered this would be in the order of 250 amperes, which is well below the 480 amperes allowed on the 600 ampere service.

5.2.2.2. Therefore, the system appears to have plenty of capacity with over 200 amperes available for growth.

5.2.3. All electrical and communications systems need to be properly bonded together for grounding purposes.

5.2.4. Replace convenience outlets and covers to get ground fault circuit interrupter (GFCI) protection and weatherproof covers.

5.3. First Floor

5.3.1. Add convenience outlets to provide the coverage needed and desired by library staff and patrons.

5.3.2. Add convenience outlet behind water cooler as recommended by manufacturer.

5.4. Lower Level

5.4.1. The 3Ø (3-phase) 120/208 volts service entrance enters the lower level on the north side of the building to feed the main distribution panel (MDP) in the northwest corner of the lower level.

5.4.2. The MDP (Main Distribution Panel) is located in the lower level.

5.4.3. The ground system should be upgraded to current standards. This should include bonding to the water line and proper bonding with the communications systems.

5.4.4. It appears that all circuits are installed in metal conduits. This is appropriate and should be continued for all added electrical work.

5.4.5. It is recommended that a TVSS (Transient Voltage Surge Suppression) system be added for two-level protection at the service. Two-level protection consists of a TVSS on the main service and on each feeder.

5.4.5.1. At present there is individual protection at the panel-boards; however, an additional TVSS unit is recommended at the main service.

5.4.5.1.1. The individual panel-board protection utilizes Square D, Model SDSA3650, supplemental surge suppressors. These units should be checked and rearranged as needed to keep the wire lead length to six inches maximum to give the fastest response time and thus the best protection. Also, they should be checked to insure that the voltage level is also at the lowest possible to allow the best peak voltage protection.

5.4.5.2. It is recommended that the library install individual protection at all sensitive use equipment such as computers to achieve a third level of protection. Most of this is already provided. (Probable cost for this item is not included in the attached estimate.)

5.4.6. Add convenience outlets to provide the coverage needed and desired by library staff and patrons.

5.4.7. The GFCI (Ground Fault Circuit Interrupter) near the sink/bubbler appears to be defective and should be replaced.

6. Lighting

6.1. First Floor

6.1.1. Emergency lighting fixtures were noted and are of varying ages and types. Maintenance personnel have stated that the units are tested regularly and replaced as needed.

6.1.2. Exit lights were noted; they are also varying ages and types. Maintenance personnel have stated that these units are also tested regularly and replaced as needed.

6.1.2.1. New exit light units should be of the LED [light emitting diode] type to provide high energy efficiency and long life.

6.2. Lower Level

6.2.1. Emergency lighting fixtures were noted and are of varying ages and types. Maintenance personnel have stated that the units are tested regularly and replaced as needed.

6.2.2. Exit lights were noted; they are also varying ages and types. Maintenance personnel have stated that these units are also tested regularly and replaced as needed.

6.2.2.1. New units should be of the LED [light emitting diode] type due to their high energy efficiency and long life.

6.3. Outside

6.3.1. Outside light fixtures are in need of cleaning and/or repair to allow the light fixtures to perform their intended functions.

7. Telecommunications and Information Systems

7.1. First Floor

7.1.1. Fire-stop sealant should be applied around the communication wires where they penetrate the floor near panel "A".

7.2. Lower Level

7.2.1. It is recommended that the ground wires for all of the telephone, data, and cable services be bonded to the building electrical system service in accordance with the National Electrical Code (NEC).

7.2.1.1. Some of the recommended connections are already made; however, they are not all correct.

8. Fire Alarm

8.1. There is a Simplex 4002 Fire Alarm system in the building. The coverage appeared to be adequate. The age of the system is not known.

8.1.1. However, all Model 4002 systems are considered to be obsolete mostly because parts are somewhat difficult to obtain.

8.1.1.1. When any major building modifications or additions are made this system should be replaced with a new fully addressable system.

8.1.2. Add a fire alarm pull station at the East exit door of the Florence Bessmer meeting room.

8.2. Duct smoke detectors are installed on the air handling units.

8.2.1. The duct smoke detectors housings have recently been replaced with new units, and should give reliable service.

9 Plumbing Systems

Roof

Roof drainage system utilizes interior roof drains on the east roof and external gutters on the west portion.

The southeast drain strainer needs to be replaced.

First Floor

There was indication of backflow from some of the floor drains on the first floor.

This should be addressed with backwater valves on each drain.

Lower Level

The present sanitary pipe drainage system appears to be mostly of cast iron and also appears to be in serviceable condition.

The lower level sanitary drainage goes to a sanitary lift station (sewage ejector) which connects to the sanitary piping for the first floor on the outside of the library on the north side.

This appears to be the source of the backflow in some floor drains on the first floor when the main line either plugs up or has flow exceeding its rated capacity.

The gas-fired water heater is 15 years old and has reached its expected useful life. Replacement should be planned in the near future.

One way to handle the failure of one of the two sump pumps is to put in a backup unit which is water-powered. This will work for short power outages and other failures of either of the two sump pumps.

This is not recommended for the sewage ejector.

Outside

Change hose bibs to code compliant units with backflow prevention.

10 Fire Protection

All areas

There is currently a fire sprinkler system in the lower level of the building. No modifications were noted as being necessary.

It was noted that the sprinkler system is tied into the building fire alarm system which is an excellent safety feature.

11 Energy Efficiency

All areas

In general the systems as installed are as energy efficient as was reasonably possible considering the date of their installation. Higher energy efficiency systems are now available for some system components.

When equipment or components are replaced higher energy efficiency and payback should be considered, and that is the approach taken in this report.

Energy efficiency can be improved with the methods noted for specific systems.

12 Demolition

All Areas

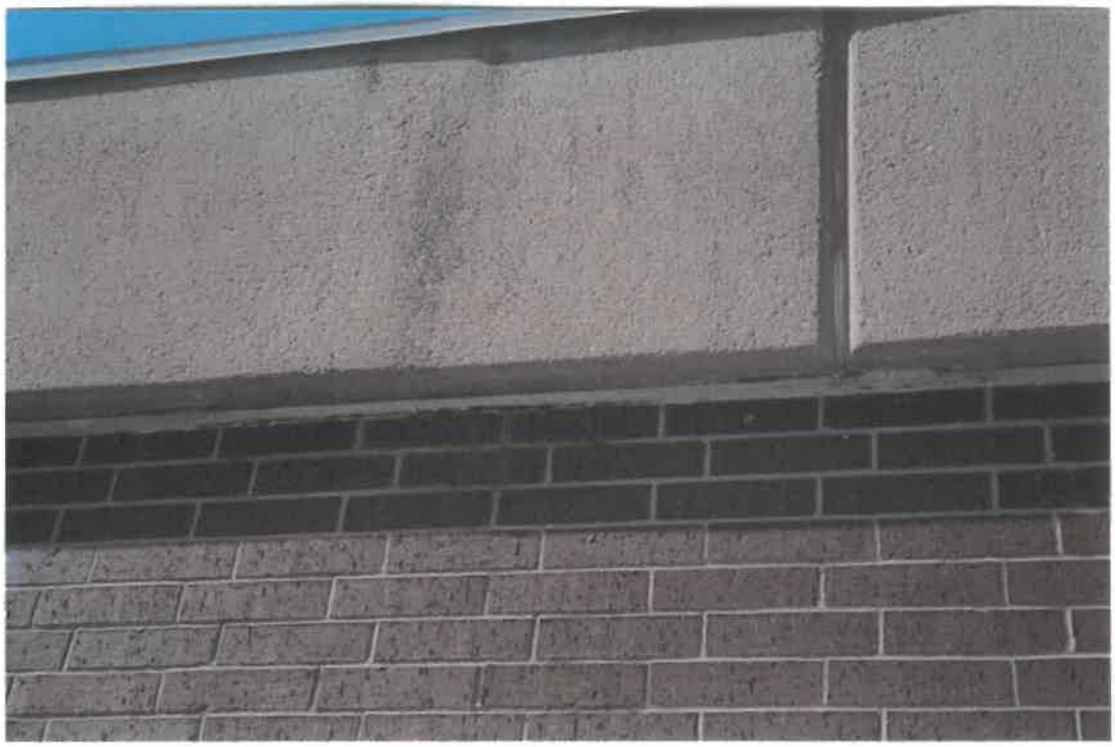
Demolition of some of the ducts will be required to change the air distribution.

Demolition of the pumps will be required during the replacement process. The estimated cost is included in the replacement amount.

1.1.3

1.1.6

1.1.5



1.1.6

1.1.6

1.1.9

1.1.7

1.1.8

1.2.5

1.2.5

1.2.5

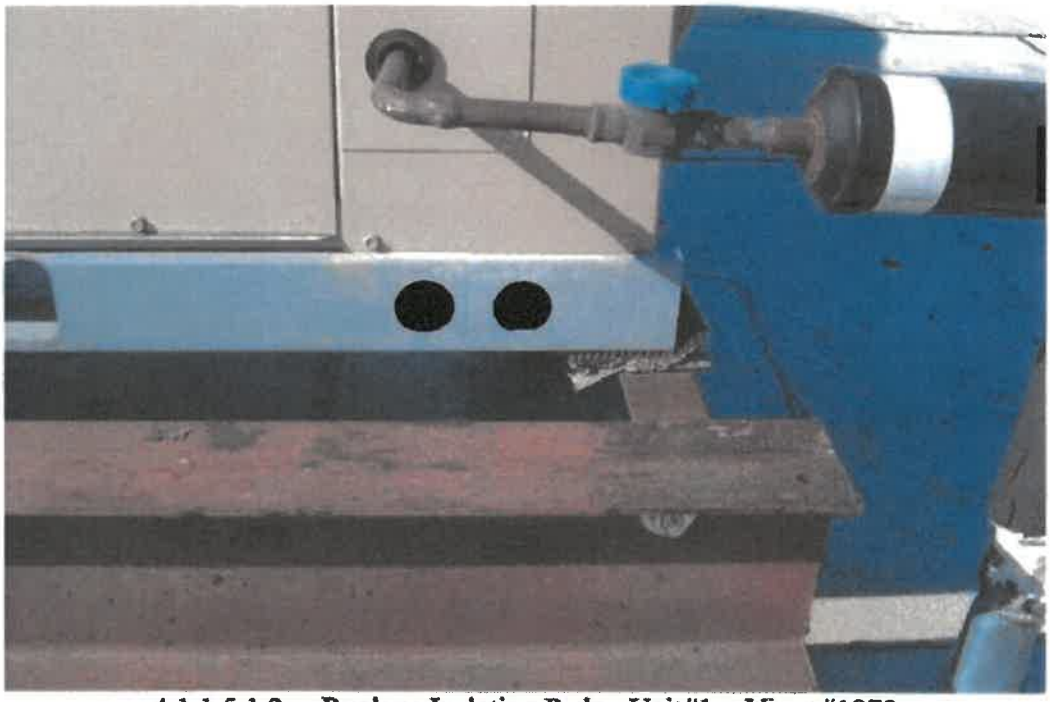
2.9

29 1.4.3

4.1.1.2.1. - EF#1 Exhaust Fan - View 1870

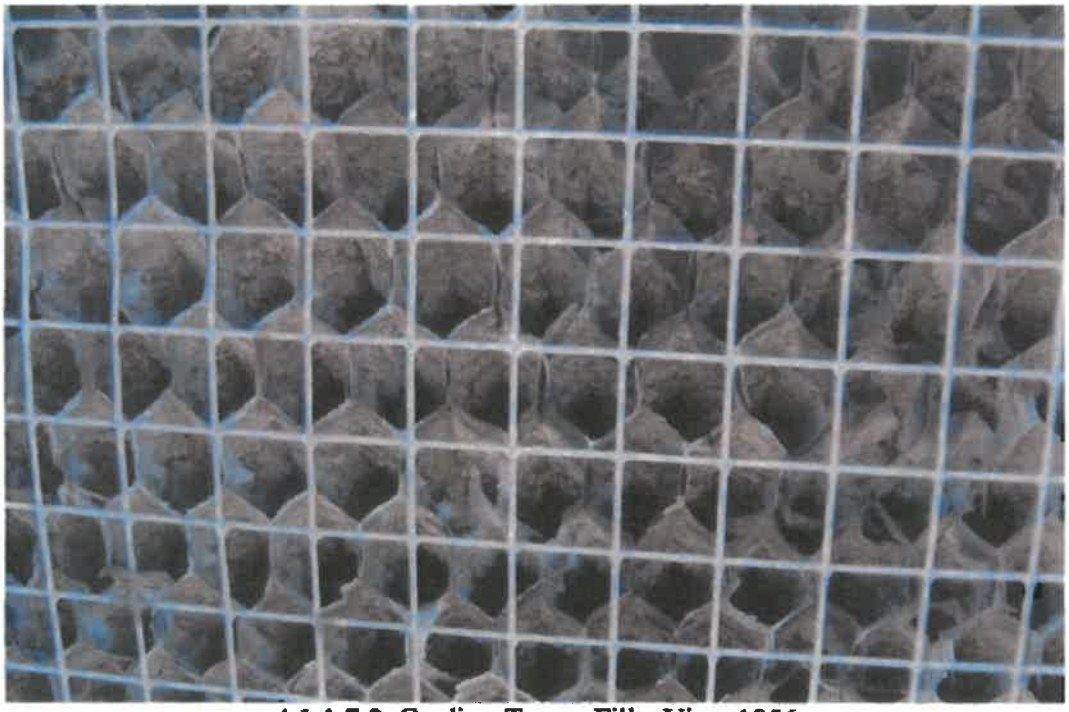
4.1.1.3. – Fresh Air Intake Hood – View 1897

4.1.1.4. – Boiler Flue – View 1921

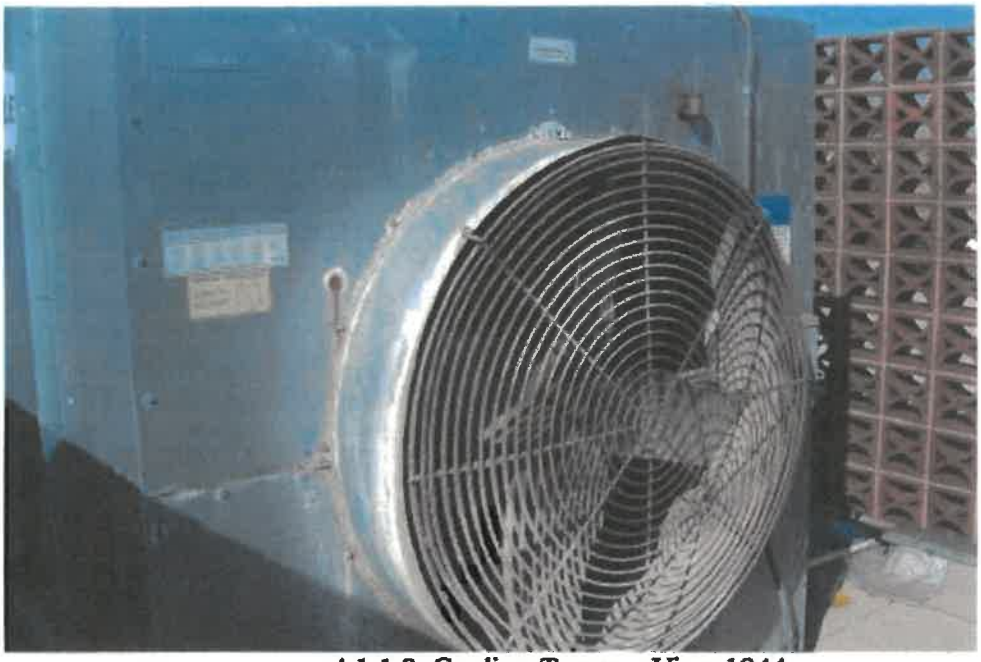


4.1.1.5.1.2. – Replace Isolation Pads - Unit#1 – View #1879

4.1.1.6.1.2. Deteriorated Pipe Insulation – Unit #2 – View 1909



4.1.1.7.2. Cooling Tower Fill - View 1856

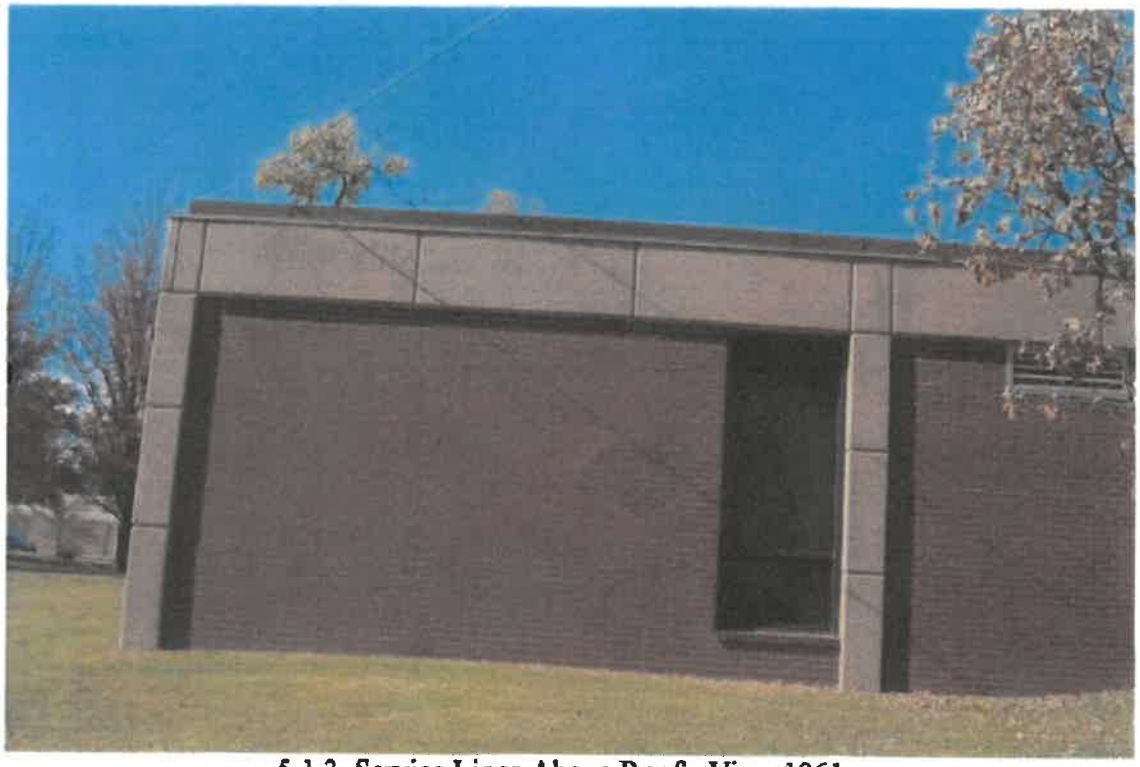


4.1.1.8. Cooling Tower – View 1844

4.2.3.2. Fin-Tube Window Heat – View 2060

4.3.5. Hot & Chilled Water Pumps – View 1996-1

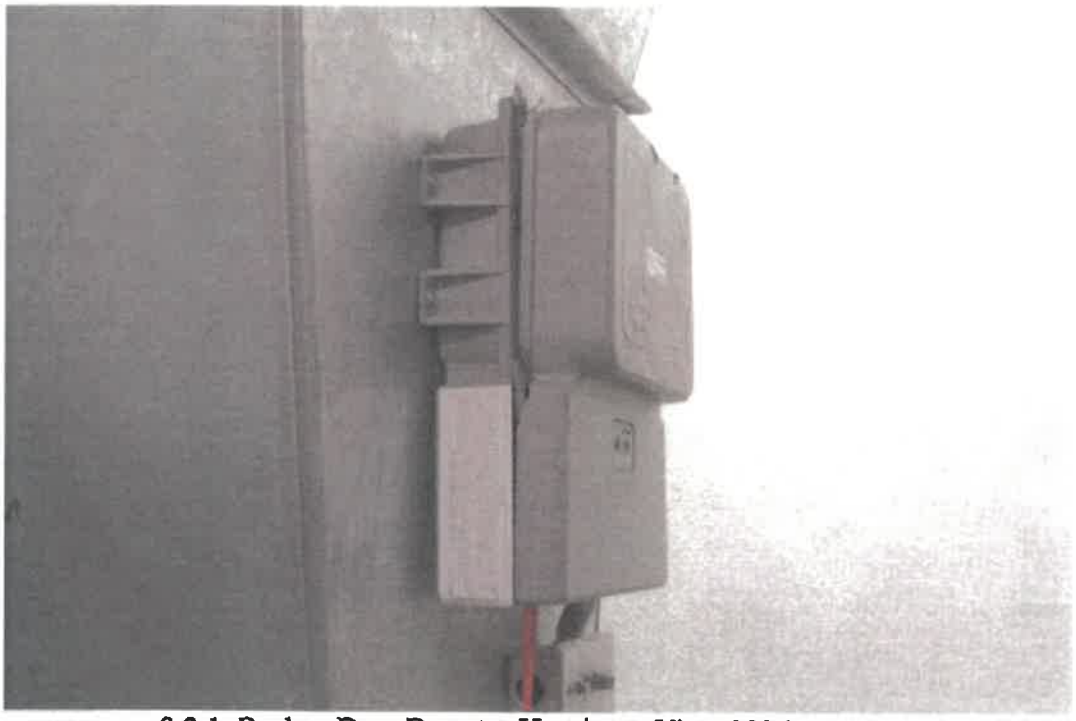
5.1.2. – Heat Trace Extension Cord – View 1864



5.1.3. Service Lines Above Roof - View 1961

6.3.1. Exterior Light Fixture - View 1940-1

7.1.1. Non-Firestopped Openings – View 2056



8.2.1. Broken Duct Detector Housing – View 2026-1

BUILDING ASSESSMENT of the NEWTON PUBLIC LIBRARY — NEWTON, KANSAS

Estimate of Probable Construction Cost for Correcting Building Deficiencies — May-08

Item No.	Description		Range of Cost Estimate Average	to	High	Remarks
1	**Architectural Systems**					
1.1	**Building Exterior Envelope**					
1.1.1	remove/replace window units; install insulating glass and insulated wall below sill height		39,923		45,712 0	
1.1.2	see 1.1.1				0	
1.1.3	see 1.1.1 & add external window shading (canvas)		4,320		4,946	
1.1.4	* wire brush, clean,and repaint steel lintels where exposed	*	600		687	
1.1.5	* remove all vines and power wash brick walls	*	4,200		4,809	
1.1.6	* repair damaged concrete and install sealent with proper backing at joints	*	7,150		8,187 0	
1.1.7	* regrade ground to drain away from building; reseed	*	1,850		2,118	
1.1.8	see 1.1.7				0	
1.1.9	* clean areaways & repair sealant at louver	*	400			
	subtotal $		58,443	to	66,459	
1.2	**Roof**					
1.2.1	* inspect roofing on original building and repair as/if required	*	?		?	add $42,808 to replace roofing
	remove previously inactivated roof drains & related piping		4,500		5,153	
1.2.2	* replace damaged roof drain/strainer (see 9.1.1.1)	*	800		916	
1.2.3	* verify that roof drain piping is insulated; insulate for >	*	2,450		2,805	
1.2.4	* reconfigure expansion joint to function as designed	*	4,455		5,101	
1.2.5	* replace roofing, roof insulation, and flashing over addition	*	19,364		22,172	
1.2.6	install additional roof insulation		7,550		8,645	
	subtotal $		39,119	to	44,791	
1.3	**Building Interior**					
1.3.1	no change; impractical to modify stairways to meet code				0	
1.3.2	* replace railings	*	1,600		1,832	
1.3.3	* add fire-rated door and enclose stairway per code	*	4,700		5,382	
1.3.4	verify clearance above elevator cab; revise as/if required					requires verification
1.3.5	remove/replace main floor ceiling for additional height		44,389		50,825	
1.3.6	remove replace main floor finishes, including carpet		43,688		50,023	
	subtotal $		94,377	to	108,062	
1.4	**General Deficiencies**					
1.4.1	insulate interior face of exterior walls; cover with gyp bd.		8,460		9,687	
1.4.2	see 1.4.1				0	
1.4.3	* extend wall to underside of main floor	*	4,200		4,809	
1.4.4	* remove/relocate/replace present book return	*	2,850		3,263	
	subtotal $		15,510	to	17,759	
2	**Functional Assessment** no construction work included for this portion of Library Building Assessment					
3	**Accessibility**					
3.2.1	new, ADA-compliant elevator; includes shaft		132,000		151,140	
3.2.2	* replace stairway handrails with ADA-compliant rails	*	3,400		3,893	
3.2.3	* replace door hardware wilt ADA compliant units	*	8,400		9,618	
3.2.4	* install power-assisted doors at restrooms	*	4,000		4,580	
3.2.5	* install "areas of rescue assistance" in stairways	*	6,200		7,099	
3.2.6	* lower cabinets to ADA conforming height	*	1,100		1,260	
3.2.7	* install ADA-compliant signage throughout the library	*	4,750		5,439	
3.2.8	* modify restrooms to be fully ADA-compliant	*	8,500		9,733	
3.2.9	* modify circulation desk for full complaince with the ADA	*	1,600		1,832	
	subtotal $		169,950	to	194,593	
	TOTAL		377,399	to	431,664	
	add 20% Contingency		75,480		86,333	
	Architectural Systems & Accessibility	**$**	**452,879**	**to**	**517,997**	
	indicates Work that could be done immediately, without interfering with future additions	*	92,569		105,534	
	with 20% contingency added TOTAL		$111,083		$126,640	

Estimate of Probable Construction Cost for Correcting Building Deficiencies

				Range of Cost Estimate Average	to High
4 Heating, Ventilating, and Air-Conditioning					
4.1.1.1.1.	Relief Attachment		*	$120	$137
4.1.1.2.1	Exhaust Fan #1 Replacement		*	$720	$824
4.1.1.3.	Modify Fresh-air Intake		*	$360	$412
4.1.1.5.1.2.	Replace Vibration Isolator Pads w. Outside Rated		*	$437	$500
4.1.1.5.1.3.	Reinsulate Refrigerant Piping & Coat w. UV Paint		*	$336	$385
4.1.1.5.1.3.1.	Seal Structure Openings - Refrigerant Pipes		*	$720	$824
4.1.1.6.1.2.	Unit #2 - Reinsulate Refrigerant Piping & Coat w. UV Paint		*	$600	$687
4.1.1.6.1.2.1.	Seal Structure Openings - Refrig. Pipes		*	$720	$824
4.1.1.8.	Replace Cooling Tower in Three Years[tower, some piping, control valve)			$31,983	$36,621
					$0
4.1.1.8.2.	Remote Tower Basin [tank, pipe, & valves, core drilling]			$5,333	$6,106
4.2.1.	Replace Other EF#1		*	$720	$824
4.2.3.2.1.	Modify air system to wash windows w. warm air			$19,817	$22,690
4.2.3.2.2.	Modify controls to reset Relative Humidity based on O.A.T.			$6,000	$6,870
4.2.4.	Clean ducts - 1st Floor			$3,000	$3,435
4.3.1.	Replace Exhaust Fan #2		*	$720	$824
4.3.2.3.3.	CO Detector - Basement		*	$324	$371
4.3.6.	Replace HW & CW Pumps			$11,973	$13,709
		subtotal $		$83,883	$96,046
5 5 Electrical Systems					
Roof					
5.1.1.	Clean & repair cooling tower disconnect switch		*	$180	$206
5.1.2.	Add Convenience outlet at cooling tower		*	$515	$590
5.1.4.	Add a building Lightning Protection System			$10,697	$12,248
Grade					
5.2.3	Complete proper bonding of building ground systems			$1,800	$2,061
5.2.4.	Add GFCI outlets outside with weatherproof covers			$690	$790
Lower Level					
5.3.1.	Add 1st Floor Conv. Outlets			$11,023	$12,621
5.3.2.	Water Cooler Conv. Outlet		*	$366	$419
5.4.3.	Upgrade ground connections to current standards			$1,800	$2,061
5.4.5.1.	Install Transient Voltage Surge Suppression - Main Srvc.			$1,680	$1,924
5.4.5.1.1.	TVSS Lead Length & Voltage Level Check/Verification			$720	$824
5.4.6.	Lower Level Conv. Outlets			$8,470	$9,698
* 5.4.7.	Replace GFCI Outlet at Bubbler		*	$120	$137
		subtotal $		$38,061	$43,580
6 6 Lighting					
6.3.1.	Repair/Replace Outside Lighting		*	$2,400	$2,748
7 7 Telecommunications & Information Systems					
7.1.1.	Fire-stop around 1st Floor Cables		*	$480	$550
7.2.1.	Complete proper bonding of building ground systems) (included in 5.2.3)			$1,800	$2,061
		subtotal $		$2,280	$2,611
8 8 Fire Alarm					
8.1.1.1.	Fire Alarm System			$30,673	$35,121
8.1.2.	Add Pull Station at E. Door Bessmer Mtg. Rm.		*	$300	$344
		subtotal $		$30,973	$35,464
9 9 Plumbing Systems					
9.1.1.1.	Replace Southeast roof drain strainer		*	$60	$69
9.2.1.1.	Install Backwater valves		*	$7,297	$8,355
9.3.2.	Replace Water Heater			$3,480	$3,985
9.3.3.	Install Water-powered Backup sump pumps w. backflow protection		*	$1,284	$1,470
9.4.1.	Modify Hose Bibbs for backflow prevention			$720	$824
		subtotal $		$12,841	$14,703
10 10 Fire Protection					
10.1.2	Install Fire Sprinkler System - First Floor (+ $25,000 if fire pump required)			$87,376	$100,046
11 11 Energy Efficiency					
11.1.3.	Included with Individual Items				
12 12 Demolition					
	Included with individual items				
		TOTAL		$257,814	$295,197
		add 20% contingency		$51,563	$59,039
	Mechanical, Electrical, and Plumbing Systems			**$309,377**	**$354,236**
indicates Work that could be done immediately, without interfering with future building addtions			*	$18,779	$21,502
		with 20% contingency added TOTAL		$22,535	$25,802

SUMMARY - Estimate of Probable Construction Cost for Correcting Building Deficiencies

1 to 3	**Architectural Systems & Accessibility**	**452,879**	**517,997**	
4	**Heating, Ventilating, & Air Conditioning Systems**	83,883	96,046	
5	**Electrical systems**	38,061	43,580	
6	**Lighting**	2,400	2,748	
7	**Telecommunications & Information Systems**	2,280	2,611	
8	**Fire Alarm**	30,973	35,464	
9	**Plumbing Systems**	12,841	14,703	
10	**Fire Protection**	87,376	100,046	
11	**Energy efficiency**		0	included in Items 4 through 10
12	**Demolition**		0	included in Items 4 through 11
	subtotal	257,814 to	295,197	
	add 20% Contingency	51,563	59,039	
	Mechanical/Electrical/Plumbing TOTAL $	**309,377 to**	**354,236**	
	Correct Building Deficiencies TOTAL $	**762,256** to	**872,233**	Construction Cost Only

NOTES

1 increase costs .05% monthly, compounded, for inflation

2 fees, furnishings, construction testing, surveys, and miscellaneous expenses not included

3 except as indicated, estimated costs assume building repair/renovation only; if building addition is constructed, both scope of work and costs will change

4 estimates are based on data acquired from R.S. Means "Repair and Remodeling Cost Data"