
**FEASIBILITY
STUDY**

**Fire Station No. 10
Eau Claire, Wisconsin**

2010

FIVE 
BUGLES
DESIGN

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Executive Summary of Probable Costs

Site: Eau Claire Fire Station #10

Date: October 8, 2010

In August 2010, Five Bugles Design was retained by the Eau Claire Fire Department to study the feasibility of renovating Station 10 to provide an additional 25 years of service. Original architectural plans indicate Station 10 was constructed in 1949 and major building systems have exceeded their anticipated life cycle. Five Bugles Design was assisted by SEH, inc. for architectural and site civil; Erickson Roed & Associates for structural assessment; and MEP Associates for Plumbing, Mechanical, and Electrical review. Included in the Executive Summary is a detailed list of probable construction costs to renovate the building. Renovation of Station 10 would be classified as maintenance work and upgrading the structure to meet current ADA requirements would not be mandated. We have however, included the estimated costs for these improvements for your review and consideration.

As a part of the study Five Bugles was asked to provide a cost opinion of replacing Station 10 with a new structure. Station 10, as it currently exists, houses approximately 9,700 SF. In replacing the station we have made assumptions in increasing the size of the station to reflect current design standards within the fire fighting profession. In general this would translate into increasing the size of apparatus floor to twenty foot wide bays with 14' overhead doors, increased turnout gear storage, incorporating a training room, and increasing dorm space to reflect a more gender diverse staff. The building size would also be increased in size to reflect the inherent requirements of ADA. It is our opinion that a new station would be in the order of 12,000 SF. Construction costs in recent years for a similar masonry building would fall in the neighborhood of \$175/SF or \$2,100,000. Including design fees and soft costs such as FF&E could easily push the cost to \$2,400,000 (Not included in our estimates are site acquisition fees for a 2-3 acre site. Our recent experience would put site acquisition at \$500,000 to \$1,000,000).

SITE REPAIRS

Retaining wall repair	20,400.00
Sub Total	20,400.00

ARCHITCTURAL/STRUCTURAL

Painting	1,800.00
Concrete Patching	17,600.00
Additional Stair	56,600.00 *Not Mandated
Tuck Pointing	40,000.00
Repair Masonry Cracks	2,800.00
Brick repair	20,800.00
Repair hose tower cracks	2,500.00
Stair well CMU repair	1,500.00
Upgrade locker/restrooms to ADA	159,000.00
Upgrade stair handrails	1,000.00
Upgrade Staff Locker	2,250.00
Repair hose reels	6,000.00
Replace Roof	42,000.00
Replace door and frames	75,000.00
Replace exterior windows	45,000.00
Shop blast and finish apparatos floor	4,500.00

Replace carpeting	110,000.00	
Replace ceiling tiles and grid	7,500.00	
Repair plaster ceiling	15,000.00	
Paint interior gypsum BD. Walls	8,000.00	
Add ADA Elevator	165,000.00	*Not Mandated
Insulate elevator wall w/ E.I.F.S.	44,200.00	

Sub Total	828,050.00
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MECHANICAL DEFICIENCIES

Replace condensate pump	4,000.00
update boiler combustion air	3,250.00
Replace aged make up air vents	38,000.00
Remove probable asbestos - Testing	2,500.00
Removal	12,500.00
Replace boiler	35,000.00
Replace apparatus exhaust fan	5,500.00
Replace aged inoperable roof fan	4,500.00
Provide dorm ventilation	24,000.00
Replace aged rin tube radiation	30,000.00
Replace aged control systems	32,000.00

Sub Total	191,250.00
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ELECTRICAL DEFICIENCIES

Replace damaged conduct	300.00
Replace aged & inadequate lighting	45,000.00
Replace aged electrical distribution	18,000.00

Sub Total	63,300.00
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PLUMBING DEFICINCIES

Replace drain & vent piping	42,000.00
Replace aged water piping	24,000.00
Replace aged fixtures	12,500.00

Sub Total	78,500.00
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1,181,500.00	TOTAL
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Civil Site Assessment

Fire Station No. 10

Eau Claire, Wisconsin

SEH No. ARCDG 113895

September 2010

September 17, 2010

RE: Fire Station No. 10
Civil Site Assessment
Eau Claire, Wisconsin
SEH No. ARCDG 113895

Mr. Steve Gausman
Architectural Design Group
393 Red Cedar Street, Suite 3
Menomonie, WI 54751

Dear Mr. Gausman:

Thank you for giving us the opportunity to complete the site assessment for Fire Station No. 10 in the City of Eau Claire. In the report you will find our observations and recommendations for site improvements to the Fire Station property. The proposed improvements will allow the Fire Department to occupy the facility for many years to come.

If you have any questions or concerns, please feel free in giving me a call at 715.205.3778.

Sincerely,

Sheryl M. Clafin, PE
Project Manager/Principal

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Civil Site Assessment

Fire Station No. 10
Eau Claire, Wisconsin

Prepared for:
Architectural Design Group and
The City of Eau Claire, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
421 Frenette Drive
Chippewa Falls, WI 54729-3374
715.720.6200

Sheryl M. Clafin, PE
Project Manager/Principal

PE Number

Date

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Civil Site Assessment

Fire Station No. 10

Prepared for the City of Eau Claire, Wisconsin

1.0 General

Short Elliott Hendrickson Inc. (SEH[®]) conducted a site visit on September 3, 2010 to review and assess the site for existing deficiencies including grading, drainage, asphalt deterioration and any site amenities that would need to be modified or replaced in the next 20 years. SEH was unable to access underground manholes, but from the site observation and utility information, our observations and conclusions are summarized.

2.0 Site Observation

A site walk through was conducted and it appears the concrete aprons and some asphalt have been recently replaced. A storm drainage system on the east side of the fire station adjacent to the overhead doors appears to be functioning and handling the storm water that drains from the site. The site grades allow the storm water to drain away from the building and to existing storm system in the adjacent streets.

It appears access to the building is adequate and the curb, concrete aprons, and asphalt are in good condition. Recent road work adjacent to the building has accommodated access to the site. The retaining wall on the east side of the building, north of the overhead doors, appears to be old and in poor conditions. There are multiple cracks and concrete deterioration occurring in the structure. A picture of the retaining wall is shown at the right.

The building site utilities appear to be adequate. There is no indication that there are issues with utility services to the building.



3.0 Assessment and Recommendations

After thorough review of the site, it is SEH's recommendation the existing retaining wall be removed and replaced during the building construction. This site improvement is the only item that will require attention in the near future.

A general cost breakdown for the replacement of the retaining wall can be found in Table 1 below.

**Table 1
Cost Estimate**

Item	Unit	Quantity	Unit Price	Total Cost
Mobilization	L.S.	1	\$2,000.00	\$2,000.00
Demolition And Removal	L.S.	1	\$500.00	\$500.00
Block Retaining Wall	S.F.	250	\$50.00	\$12,500.00
Seeding And Restoration	L.S.	1	\$2,000.00	\$2,000.00
Subtotal				\$17,000.00
Contingency - 20%				\$3,400.00
Total Estimated Site Improvements Construction Cost				\$20,400.00

The remainder of the property and surrounding utilities appear to be in good condition and will serve the City of Eau Claire Fire Department into the future.

Architectural Assessment

Fire Station No. 10

Eau Claire, Wisconsin

SEH No. ARCDG 113895

September 2010



Multidisciplined. Single Source.
Trusted Solutions.



September 17, 2010

RE: Fire Station No. 10
Architectural Assessment
Eau Claire, Wisconsin
SEH No. ARCDG 113895

Mr. Steve Gausman
Architectural Design Group
393 Red Cedar Street, Suite 3
Menomonie, WI 54751

Dear Mr. Gausman:

Thank you for giving us the opportunity to complete the architectural assessment for Fire Station No. 10 in the City of Eau Claire. In the report you will find our observations and recommendations for architectural improvements to the Fire Station property. The proposed improvements will allow the Fire Department to occupy the facility for many years to come.

If you have any questions or concerns, please feel free in giving me a call at 715.720.6281.

Sincerely,



Bob Sworski, AIA
Project Manager

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Architectural Assessment

Fire Station No. 10
Eau Claire, Wisconsin

Prepared for:
Architectural Design Group and
The City of Eau Claire, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
421 Frenette Drive
Chippewa Falls, WI 54729-3374
715.720.6200



Bob Sworski, AIA
Project Manager

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Architectural Assessment

Fire Station No. 10

Prepared for the City of Eau Claire, Wisconsin

1.0 General

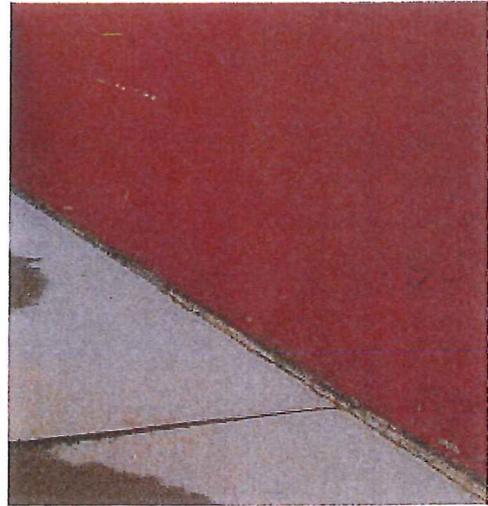
The Eau Claire Fire Department is a 3 story building with brick façades and a concrete masonry unit (CMU) backup wall surrounding a reinforced concrete and steel structure. It houses approximately 9,700 square feet of office and apparatus bay. There is ground entry access to both the first level as well as the basement level.



The paint on the exterior face of the building, surrounding the overhead doors, is scratched and damaged. It is recommended that the concrete be repainted.

- Work is to consist of painting the exterior concrete façade around the overhead doors.

Associated Cost: \$1,800



There are portions of the reinforced concrete structure (beams members) that are cracked and damaged. It is recommended that these areas be patched and painted.

- Work is to include patching the cracked and chipped concrete planks and structural members throughout the facility. It will also include the painting of all patched areas.

Associated Cost: \$17,600



There is currently only one means of vertical egress. Code will require that a secondary egress be added to the facility. This will require construction/adding a stairway.

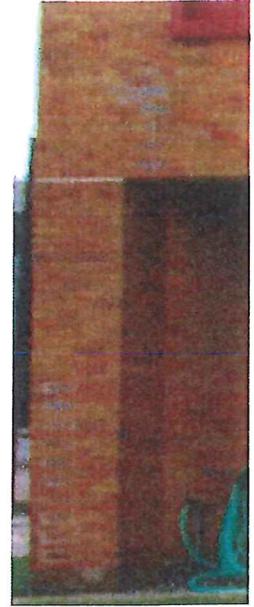
- Work is to consist of the demolition of walls, floors and ceilings as required to incorporate a secondary vertical egress exit. Note that this work does not include a vertical elevator.

Associated Cost: \$56,600

The mortar joints on all façades of the building are cracking and in need of replacement. Tuck pointing is recommended for the entire building.

- Work is to include tuck pointing of all façades.

Associated Cost: \$40,000



There is vertical cracking occurring above two of the overhead doors. It is advised that control joints be put in above the overhead doors on the west side of the building.

- Work is to consist of creating control joints and caulking at both corners of the overhead doors. In some locations it will also require brick patching and repair.

Associated Cost: \$2,800



There is discoloration of the brick above the windows on the north and west façades, it is likely caused by moisture remaining within the wall and then leaking out. It is recommended that a portion of the brick above the windows be removed, flashing and weeps to be installed throughout the wall, then the brick is to be patched and repaired.



- Work is to consist of the removal and replacement of approximately 1'-6" of the brick above the windows on the north and west façades. Weeps are to be included above the windows. The existing brick is to be matched as closely as possible.

Associated Cost: \$20,800

Cracking has occurred along the hose tower wall. It is recommended that the cracked CMU block be removed and replaced. Control joints should also be cut into the block to discourage future cracking.

- Work is to include the removal and replacement of cracked or damaged CMU's in the hose tower. It is also to incorporate creating and filling control joints with a flexible caulking/sealant.

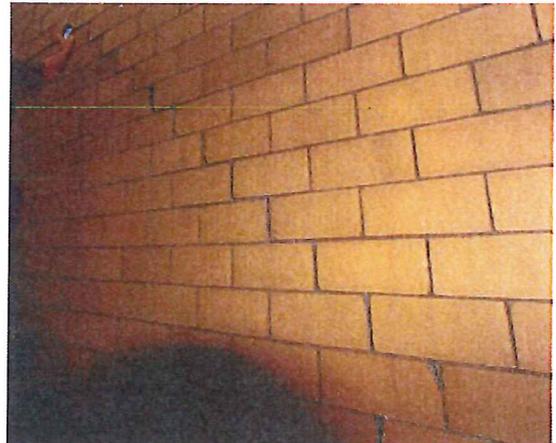
Associated Cost: \$2,500



There is damage along the CMU wall in the stair well. It is recommended that the cracked CMU's be replaced. Control joints should also be added to the wall to prevent future cracking.

- Work is to include the removal of cracking CMU's and replacement as well as creating control joints within the wall surface. Control joints would be filled with flexible caulking/sealant material.

Associated Cost: \$1,500



The existing restrooms are not ADA compliant. It is recommended that the restroom/shower areas be remodeled to meet current ADA code requirements. The restrooms on the first and second floors will each contain one toilet, one shower, one lavatory, and a locker room. In addition to this, each of the men's restrooms will also have one urinal.

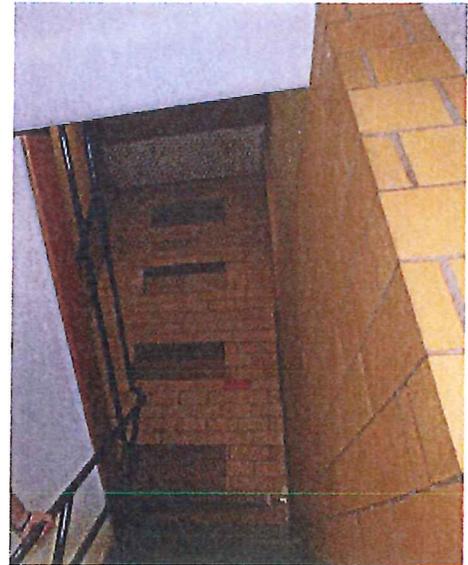
- Work is to consist of the demolition and remodeling the existing restrooms and shower areas to accommodate ADA requirements.

Associated Cost: \$159,000

Along the stairways the guardrails are too far apart and are missing handrails, this does not meet code. They should be modified to meet the requirements of IBC Chapter 5.

- The railings and handrails lining the stairways are to be modified to have railings/handrails that meet the current code requirements.

Associated Cost: \$1,000



The lockers met their expected life expectancy and are in need of replacement.

- Work is to consist of the removal and replacement of all lockers.

Associated Cost: \$2,250



Over time, water has caused damage to the hose reels in the hose tower and they are in need repair. The recommended treatment is that they be prepped and painted.

- Work is to consist of prepping hose reels and coating reels with epoxy paint.

Associated Cost: \$6,000



The roof is not draining water as is intended to, and as a result the roof is retaining water in many areas. It is probable that the roof will require replacement within 5 to 10 years. Also, the parapet coping will require replacement.

- Work is to consist of tearing off the existing roof and replacing with a fully adhered EPDM roof membrane. It should also incorporate the removal and replacement of all coping.

Associated Cost: \$42,000



Doors and frames are rusted/damaged and the hardware is not ADA compliant. It is recommended that the doors be replaced, the frames painted and the doors contain hardware that meets current ADA requirements.

- Work is to consist of replacing of all doors with ADA compliant hardware and the painting of all existing frames.

Associated Cost: \$75,500



The windows met their expected life cycle. Complete window replacement is recommended.

- Work is to consist of the removal of existing windows and surrounding material to accommodate the installation of larger, new, more energy efficient windows.

Associated Cost: \$45,000



There are many stains and discoloration of the concrete floor within the apparatus bay. It is recommended that an epoxy finish be applied to the floor.

- Work is to include prep of the existing concrete floor, and subsequent installation of epoxy floor coating. Finishing with a liquid epoxy coating approximately 1/4" thick.

Associated Cost: \$4,500



The carpeting throughout the building is beginning to show the years of wear. It is recommended that the carpeting be replaced, including the rubber base.

- Work is to include the removal and replacement of all carpeting and rubber base.

Associated Cost: \$110,000



In areas where vinyl composition tile is located the tile is showing signs of age such as scratching, cracking, and slight delaminating along the edges of the tiles. The rubber base along the walls in these areas is also delaminating and in need of replacement. This is a consistent occurrence given the age and use of the tile and adhesive.



- Work is to consist of the removal and replacement of all vinyl composition tile and rubber base.

Associated Cost: \$750

There is currently a 2x4 ceiling tile grid systems within the facility. It is recommended to upgrade the 2x4 grid to a 2x2 ceiling system.



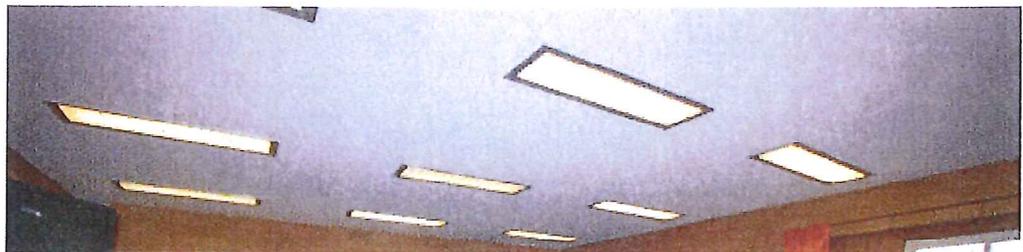
- Work is to consist of the removal of all 2x4 ceiling grid systems and replacement with a 2x2 grid system.

Associated Cost: \$7,500

Plaster ceilings will require some patching and subsequent painting of the entire plaster ceiling when the lighting is modified. Exposed ceilings are also to be painted.

- Work is to include patching and painting of plaster ceilings as well as painting of the exposed structure.

Associated Cost: \$15,000



Interior walls that are composed of concrete or gypsum are in need of painting.

- Work is to consist of painting all concrete, CMU or gypsum walls.

Associated Cost: \$8,000

The inclusion of a two stop elevator is required by code in such a public building. The City may elect to request a variance from the Wisconsin Department of Commerce.

- Work is to include the installation of a two stop elevator.

Associated Cost: \$165,000

2.0 Alternate – Exterior Insulation

This alternate would be an addition to the total and is to include skinning the building with exterior insulation such as EFIS (acrylic stucco over various thicknesses of rigid insulation). The current wall construction contains insufficient amounts of insulation for the buildings' geographic location in northern latitude.

- Work is to include wrapping the entire building with an exterior insulation.

Associated Cost: \$44,200

Ericksen Roed & Associates

Structural Engineers
Eau Claire Office
3610 Oakwood Hills Parkway, Ste 1
Eau Claire, Wisconsin 54701
Ph: 715-552-5336

Steve Gausman, AIA, NCARB
Architectural Design Group
393 Red Cedar Street, Suite 3
Menomonie, WI 54751

September 1, 2010

Re: Structural Engineering Observation
Eau Claire Fire Station No. 10

ER Project No.: 2010-220

Dear Steve:

Per your request, we have conducted a structural evaluation of the conditions regarding the existing 1950 fire station No. 10 in Eau Claire, WI. This evaluation is based upon a limited visual site observation performed August 26, 2010. This evaluation was a general overview of the building to find any signs of structural distress which would inhibit the future life of the building.

Generally, the building is sound and has minimal areas of structural distress. The areas of structural distress observed were not significant. Most of the problem areas were localized cracking due to thermal/temperature or initial settlement (normal with most building of this age). Many of the cracks observed were cosmetic and did not pose much structural concern. The interior of the hose tower showed the most signs of cracking for any one area of the building. This cracking appeared to be thermal/temperature related, caused from lack of control joints and material expansion/contraction.

We believe that the fire station No. 10 structure will be adequate and sound for another 25 years. It is recommended that periodic inspections be made of the apparatus floor, since this area is exposed to salt/deicing chemicals from the vehicles during the winter months.

We also recommend addressing the following areas of the building with remedial action to help prolong the life of the building: underside of the apparatus floor, hose tower, and the South East corner of the building.

The enclosed report provides more detailed information. Back-up notes, pictures, sketches, etc. regarding our findings will be retained on file in our office.

Please contact us with any questions or comments you may have. We appreciate the opportunity of providing you our professional services.

Regards,

Terry D. Nuesse, P.E.
Professional Engineer
WI. Reg. # 38260

I. STRUCTURAL ENGINEERING OBSERVATION SCOPE OF WORK

The intent of this evaluation was to perform a limited structural engineering visual observation of the existing fire station located at 559 North Hastings Place, Eau Claire, Wisconsin. This evaluation will be part of a study used to determine the viability of getting another 25 years of life out of the building/facility.

The scope of services was limited to non-destructive site observations of the exposed building structure. A site observation was performed on August 26th, 2010 of the exterior and interior spaces of the building. No detailed site measuring, surveying, testing, etc. were performed as part of this evaluation. Due to obvious conditions of finishes, obstructions, etc., it was not possible to observe all of the building areas and/or other structural elements. All of the existing 1949 architectural and structural documentation were made available to Erickson Roed.

Present at the site observation: Mr. Lyle Koerner, Jr., M.S., E.F.O. - Eau Claire Fire Department
Mr. Terry Nuesse, P.E. - Erickson Roed and Associates

II. Background

This building, which was constructed in the early 1950's, is a two-story administrative area plus single story apparatus bay. Both areas are above a basement level which houses vehicle and general storage. The existing structural framing consists of:

Basement Level

The floor is a 5" thick cast in place concrete slab on grade. The foundations (based upon the existing documents) are conventional cast in place concrete footings. The interior and perimeter foundation walls in the basement were constructed of cast in place concrete. There are four interior cast in place concrete columns supporting the center spans of the main apparatus bay. There is a drive under vehicle storage/garage area in the basement below the apparatus bay. The vehicle entrance to the basement garage is on the East side of the building.

Main Level

The main level structure consists of cast in place concrete beam and slab supporting the apparatus bay, where the emergency response vehicles are housed. This floor is supported by cast in place concrete columns and walls down to the foundations. The North-West corner of the main level floor (training area) utilizes structural steel bar joists with a 2 1/2" concrete slab on expanded metal lath. The North-East corner of the main level is supported by a slab on grade where there is no basement area below.

2nd Floor/Low Roof

The 2nd floor (North half of building) is composed of the steel bar joists with the 2 1/2" concrete slab above expanded metal lath. The low roof over the apparatus bay is framed with 1 1/2" metal deck supported by long span steel bar joists. All of the joists bear on concrete masonry units (cmu) down to the foundation walls.

High Roof

The high roof over the 2nd floor area is made up of 1 1/2" metal deck over steel bar joists bearing on cmu walls.

Hose Tower

The hose tower is a roughly 25 ft clear height from the main level to the under side of the concrete roof slab roof. There is a steel grating catwalk which runs the length of the tower at the high roof elevation. The hose tower roof is constructed of 5" thick concrete cast in place flat plate bearing on the cmu walls.

Exterior Walls

The exterior walls are made up of brick with load bearing cmu back up. The wall openings are supported by structural steel wide flange beams/channels with steel bottom plates. There is a parapet wall roughly 3'-0" in height around the hose tower, high roof and low roof. The East side of the building has a stand alone cast in place concrete retaining wall separating the higher grade elevations to the North and lower grade at the drive under basement garage area.

III. STRUCTURAL ENGINEERING SUMMARY OF FINDINGS

Interior

1. Lower Level Boiler Room – Vertical cracks were observed on the North and East foundation walls. These vertical cracks were only a few millimeters in width and are consistent with drying/shrinkage cracks formed within the first few weeks/months of the building during construction.
2. Lower Level Vehicle Storage Room – Vertical drying/shrinkage cracks were present between the mechanical louver opening and the window opening of the East exterior foundation wall just North of the vehicle doors. The size of these cracks was slightly larger than hairline.
3. Lower Level Storage room – Drying/shrinkage cracks with in the interior cast in place bearing wall above the entrance door jamb. This crack was just slightly larger than hairline in size
4. Hose Tower – Vertical cracking was observed within the masonry block wall. These cracks appear to be in many different locations inside of the tower. The largest cracks, which were about 1/4" to 3/8" in width, appear to be in line with the intersecting East wall of the apparatus bay. These cracks were mainly separation cracks along the plane of the wall and did not show signs of vertical settlement or horizontal shifting out of the wall plane. They did not appear to transfer thru to the exterior brick façade. These cracks appear to be due to thermal expansion and contraction due to lack of wall control joints and likely occurred earlier in the building life. They are now acting as a thermal expansion/contraction relief for this area of cmu wall.

There were signs of interior water staining and efflorescence on the cmu block walls near the south east corner just below the tower roof. This area shows signs of previous water/moisture entry and it is not known if this problem is continuing. The block in this area did not appear damp.

5. 2nd Level Dining/TV Room – A small portion block face was missing on the South side of window sill.
6. West Stair - Corbel cracks within the cmu block wall between mid-landing and 2nd floor along the South walls. Lyle mentioned that these cracks have been there prior to the early to mid 1980's since he has been at this building. These appear to be caused from initial foundation settlement along the South stair wall. This crack had been patched recently. There did not appear to be any additional crack propagation since the patch was made.

7. Main Level Apparatus Bay – The center construction joint had been resealed and looked good. The concrete under slab areas had not been repaired. Corroded/delaminated rebar and spalled concrete is still exposed in small localized areas near the floor drain. It appeared that this under slab area had not been worked on during the center floor joint sealing process.

Exterior

1. South East Corner – On the South East corner of the building there was a diagonal crack noticed in the concrete cast in place wall just South of the vehicle door. This crack was just below at the main level elevation and it is exposed on both the South and the East elevations of the building. This crack appears to be due to the lack of control/construction joints with in the cast in place wall.
2. Boiler Chimney Stack- This stack, which extends 2'-0" above the hose tower roof, should signs of weathering issues. The brick grout joints had slight gaps and separation.

IV. RECOMMENDATIONS

The following recommendations for remedial action are to help prolong the intended useful life of the building:

1. Main Level Apparatus Bay – The deteriorated concrete and corroded reinforcing below the floor slab near the drains should be cleaned and patched. This will help aid in future observations and act as a bench march of current conditions of the under slab to determine in the future if the deterioration of the concrete and reinforcing is progressing.
2. Hose Tower – The main cracks in this area should be chased with a router and sealed with a construction grade elastomeric sealant/caulking to allow for slight movements due to thermal expansion of the wall. This will also help aid in determining for future observations if the wall is propagating beyond the limits of the sealant.

An inspection of the hose tower roofing, flashing and parapet should be performed to determine if water and moisture is properly kept out side of the tower.

Grout tuckpointing should be performed in the boiler chimney stack above the hose tower roof to limit any unwanted water infiltration and potential freeze/thaw damage to the brick and cmu backup.

3. South East Corner – This diagonal crack should be cleaned and sealed with an with a construction grade elastomeric sealant/caulking to allow for slight movements due to thermal expansion of the wall. This will also help aid in determining for future observations if the wall is propagating beyond the limits of the sealant.

THIS IS THE CONCLUSION OF THE OBSERVATION REPORT.

Fire Station Condition Assessment

Eau Claire Fire Station #10
559 North Hastings Way
Eau Claire, WI 54703

On August 13, 2010, we visited the fire station, to do a condition assessment of the HVAC, Plumbing, and electrical systems.

HVAC

The existing Heating plant consists of a dual fuel, gas/oil fired, low to mid-efficiency steam boiler (70% AFUE +/-), and low pressure steam fin-tube radiant heating. The boiler, piping, and radiation are all original equipment, and beyond their useful life.

Ventilation in the office area is limited to bathroom exhaust, which is turned on manually. The living quarter's ventilation has bathroom exhaust and kitchen exhaust, but switched on manually. Bathroom exhaust appears to be lower than 75 CFM per fixture, required by current codes.

The lower level storage and repair garage, and the apparatus floor have ductwork for code required exhaust, but the fan is inoperable. There are no controls to turn ventilation on or off, for the two areas. Each of the two areas has a dedicated makeup air unit, but most likely, only re-circulating the air for heating. The apparatus floor has a direct connect type of carbon monoxide evacuation.

Cooling – The office and living quarters are cooled by inefficient through-wall window air conditioners.

Temperature Controls – The building is served by pneumatic controls, which control makeup air units and radiation controls. There are limited thermostats, so controls are not very efficient.

ELECTRICAL

The main electrical distribution panel is 240/120 Volt, with a 200 Amp main breaker. Distribution cabling is provided to 3 remote panels.

A bus bar system is installed in the repair area.

Distribution to receptacles is provided in conduit. Many of the outlets were added after the building was finished, and conduits are wall mounted.

Phone and data is run in surface mounted wire-mold

Smoke detection is provided throughout the building.

Radio equipment is wired from the antenna which is mounted at the high part of the hose tower.

PLUMBING

Water is distributed throughout the building in galvanized and copper pipes.

Drain, Waste and Vent is piped to city sewer in 4" cast iron, with small sections of PVC piping, where the system has been remodeled. The repair garage and apparatus floor have floor drains that do not appear to have sand traps or catch basins.

Storm water is piped to city storm.

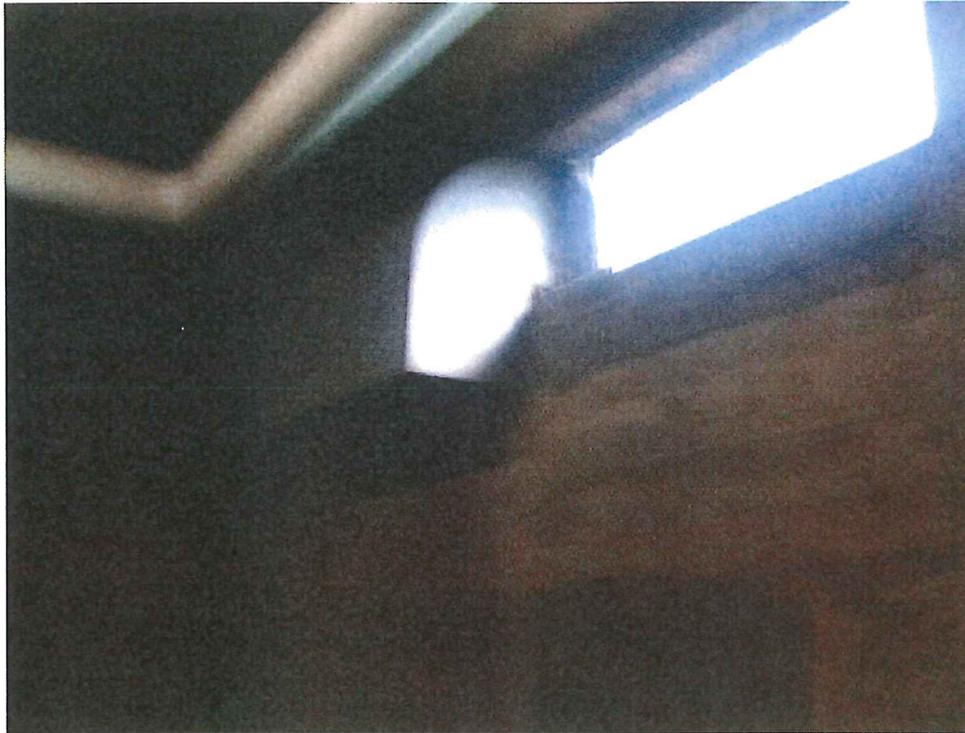
Condition Deficiencies (Deferred Maintenance)

HVAC

1. Aged and obsolete condensate pump. The condensate pump that serves the boiler is aged beyond its useful life and should be replaced. Estimated cost - \$4,000



2. Questionable Combustion Air operation – The Combustion air intake for the boiler has no automatic shut-off damper, and is located at grade, outside. The open duct allows cold air in all of the time, and likely draws snow into the building during the winter. A damper and window well should be added. Estimated cost - \$3,250.



3. Aged Makeup Air Units – The makeup air units serving the Apparatus floor, and the repair & storage garage are aged and should be replaced, and controlled to interlock with new exhaust fans to serve the floors. IMC and Wisconsin codes require exhaust within 18" of the floor. This exhaust must run whenever the area is occupied, or must run a minimum of 5 hours per day, with Carbon Monoxide and Nitrous Oxide sensors to override the timer. See note 4 for cost.



4. S1 Occupancy Exhaust required within 18" of floor – The ducts and grilles are present to provide exhaust from within 18" of the floor in the Apparatus area, and the repair/storage garage in the lower level, but the fan has been inoperable for several years. International Mechanical Code (IMC) and Wisconsin codes require exhaust within 18" of the floor. This exhaust must run whenever the area is occupied, or must run a minimum of 5 hours per day, with Carbon Monoxide and Nitrous Oxide sensors to override the timer. Total cost for new exhaust fan, with makeup air and controls. - \$31,000. If an energy recovery ventilator is used instead of the exhaust fan and makeup air, the cost would be approximately \$38,000, but the payback would be very short.



5. Possible Asbestos - The fittings on the steam pipes are insulated with a material that appears to be Asbestos Containing Material (ACM). It is recommended that the materials be tested, and removed, if ACM. Estimate for testing - \$\$2500. Estimate for removal and replacement - \$12,500.



6. Aged Chimney – The chimney serving the boiler is showing signs of age. The liner has some cracks that could allow Carbon Monoxide to seep into the building. It is recommended that the chimney be replaced in conjunction with a new boiler. See Note 7 for cost estimate on boiler and chimney.



7. Aged and Inefficient Boiler – The boiler is the original heating plant. It is a very inefficient type, and is aged beyond its useful life. Replacement under emergency conditions would be probably double the cost of planned replacement, so it is highly recommended that this equipment be replaced. Estimated replacement cost - \$35,000.



- 8. Garage & Apparatus Floor Exhaust Fan – Replacement included in note 4. Above, but the fan is less than 10 feet from the edge of the roof. A guard rail should be installed to assure life safety for fans less than 10 feet from edge. Estimated cost \$5,500.



- 9. Aged and Inoperable fan. It is not known what the fan serves. It appears to be above the kitchen, but does not run, and is not approved for grease duct exhaust. The fan should be removed and roof patched, or determination made on its use, and the fan replaced. \$1,500 estimate to remove and cap, \$4,500 to replace with a similar type.



10. Dormitory area and offices have no ventilation. When the building was built, it was ok to provide operable windows in lieu of ventilation. The windows were removed, so the space does not meet codes for minimum ventilation. This is an indoor air quality issue that should be resolved. Estimated cost for an energy recovery ventilator for each floor. \$24,000.



11. Aged wall fin radiation and distribution piping – The existing wall fin radiant heat is aged, and beyond its useful life. The steam pipe and radiant elements are likely calcified. Steam leaks can be costly to repair, and calcification will prevent efficient heat transfer. It is recommended that sample sections of the pipe be removed to inspect the pipe and radiant elements to inspect the actual condition. Estimated cost of inspection \$1,800. Estimated cost of replacement - \$25,000 - \$30,000



12. Aged Controls – The current controls are minimal, and provided by pneumatics. The pneumatic tubing gets water inside, and corrodes, creating leaks that affect comfort and control. The system cannot provide energy saving logic, and consideration should be given to replacing with Direct Digital Controls (DDC). Estimated cost of DDC for current systems \$25,000. Estimated cost with upgraded equipment \$32,000.

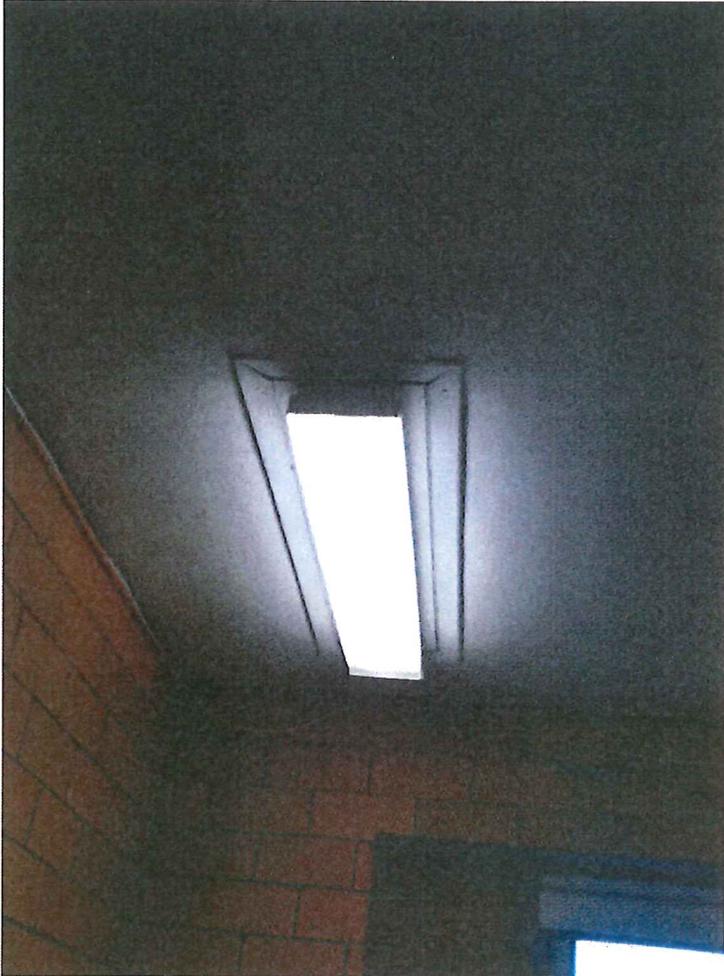


ELECTRICAL

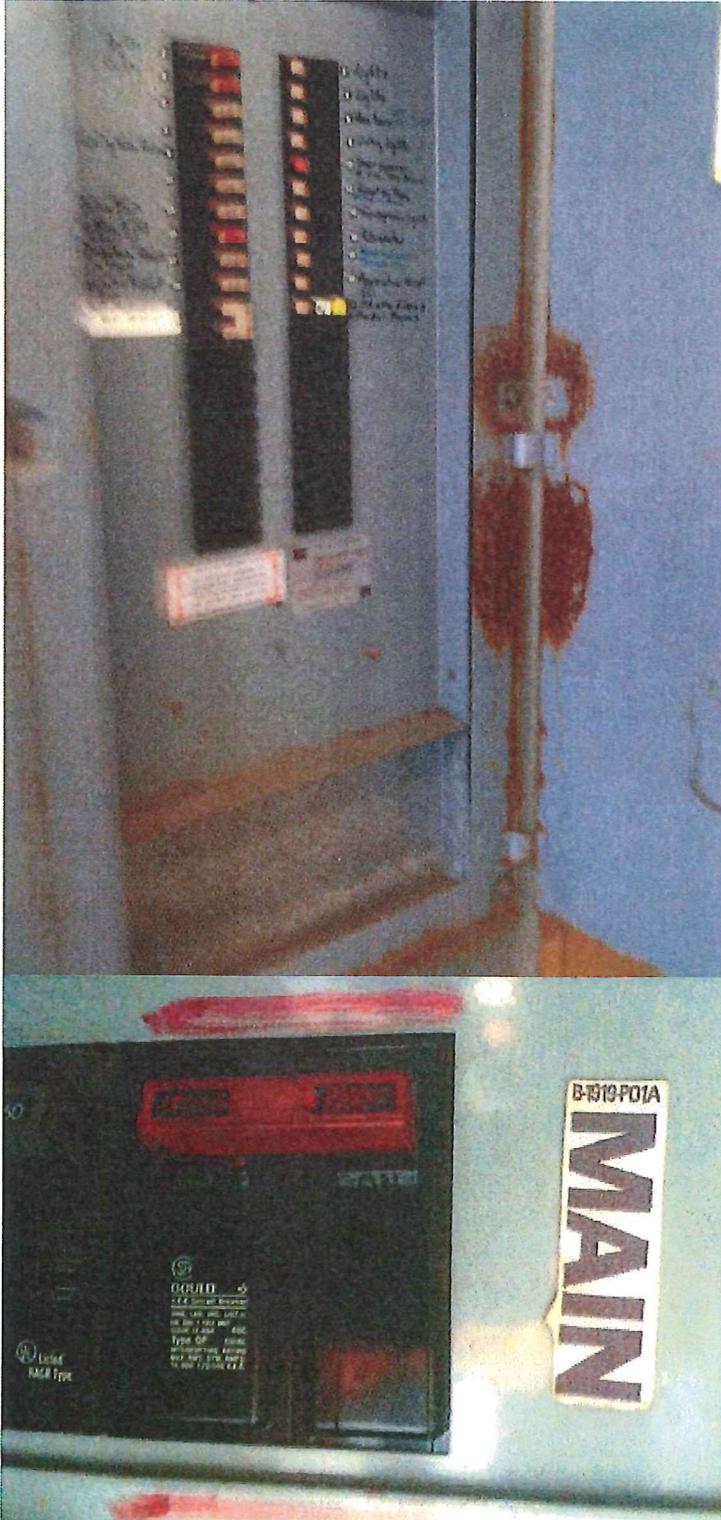
1. Damaged Conduit (Life Safety) – A conduit in the boiler room has been broken loose, and should be repaired, to prevent injury. Estimated cost - \$300.



2. Aged and Inadequate Lighting – The lighting throughout the building is inadequate and aged. It does not provide a good image to the public, and does not appear to provide the minimum foot candles required, especially in the office area. Estimated cost to replace lighting throughout building - \$45,000.



3. Aged Electrical Distribution – The existing electrical distribution consists of aged panels and wiring. It may be hard to find repair parts for the panels, and the wiring may be getting brittle from the heat produced when electrons flow through the circuits. The panels should be replaced, and at a minimum, the wiring should be tested. Estimated cost for the panels, including the main - \$18,000.

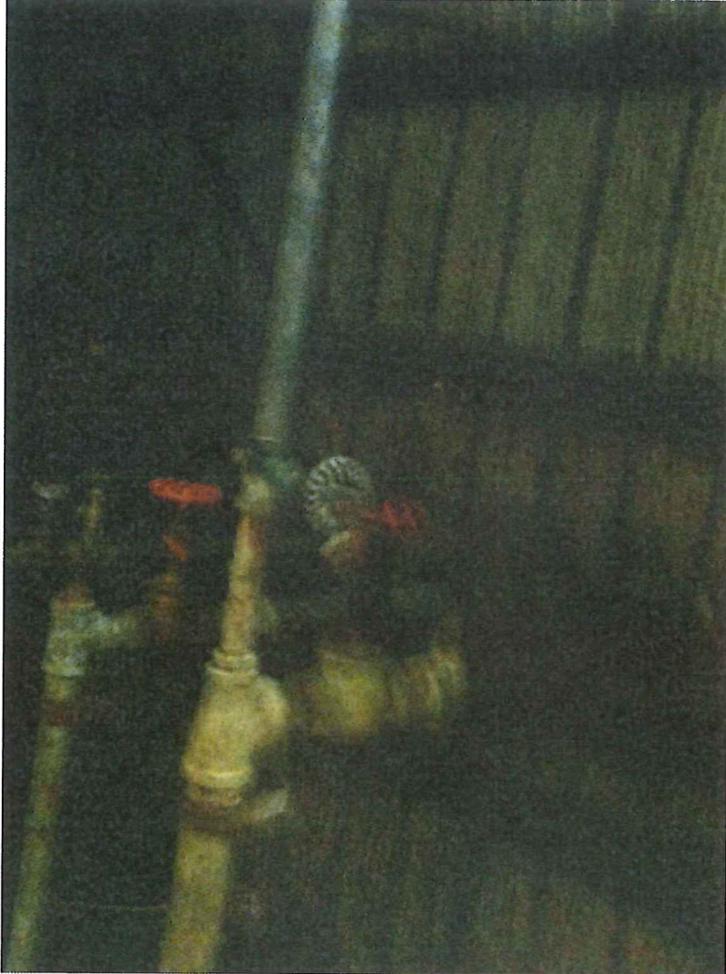


PLUMBING

1. Drain waste and vent piping is aged beyond its estimated life. The piping should be tested to determine the integrity of the pipe. Estimated cost for testing - \$2,000. Estimated replacement of above ground pipes - \$32,000. Estimated cost of replacing underground piping - \$42,000.

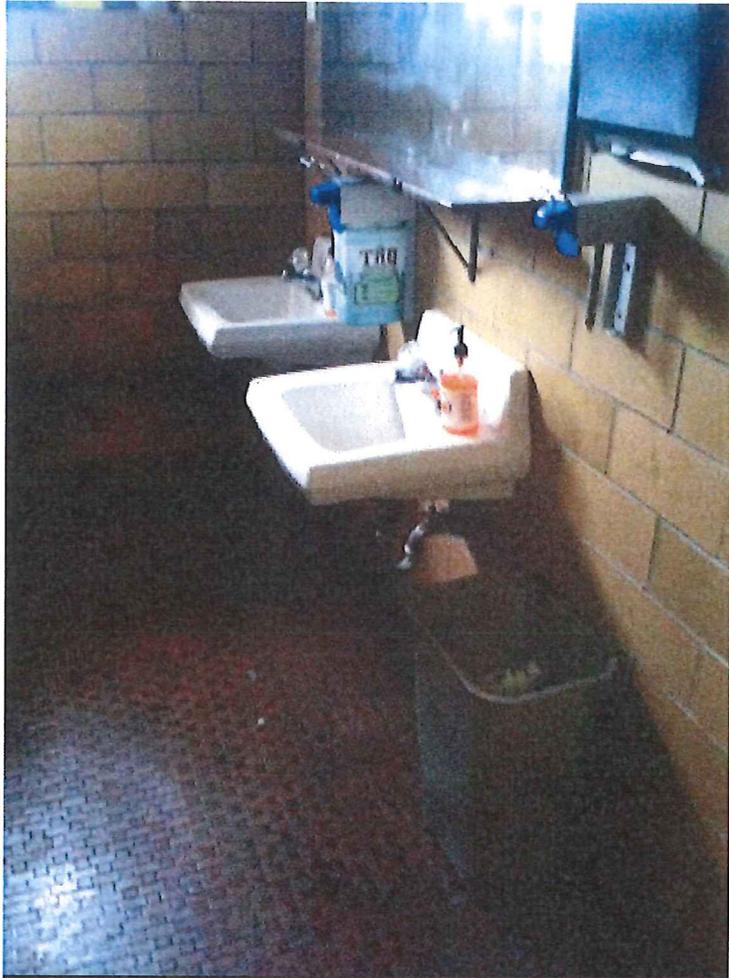


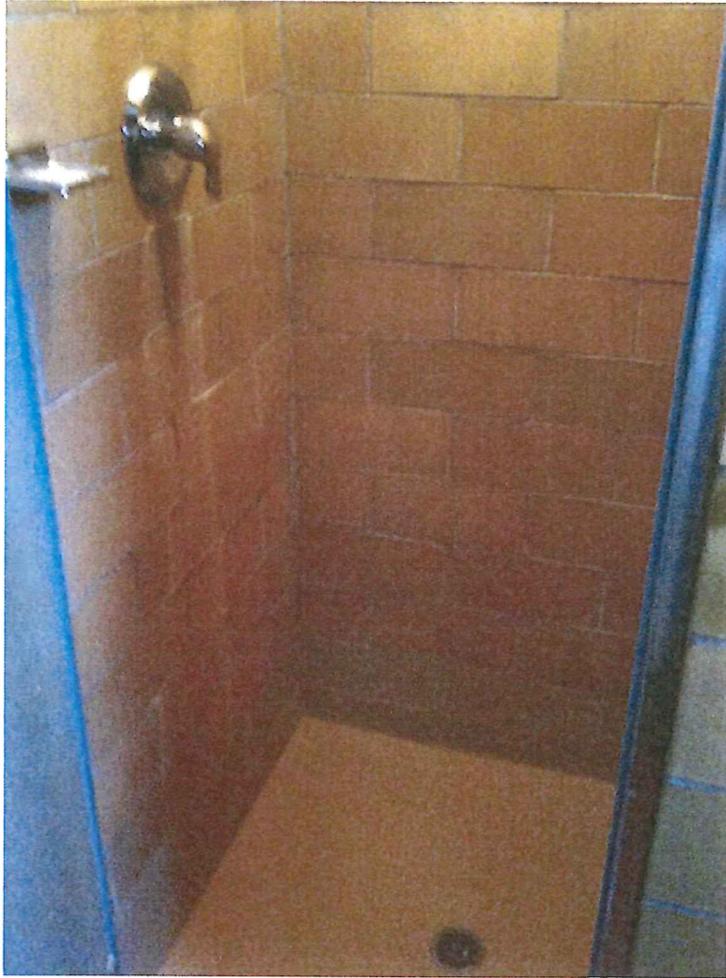
2. Water piping aged – the water piping is aged beyond its expected life. The piping should be tested to determine integrity, and replaced if the pipe is damaged. The cost to replace under emergency situation will cost considerably more. Estimated testing cost - \$2,500. Estimated replacement - \$24,000.

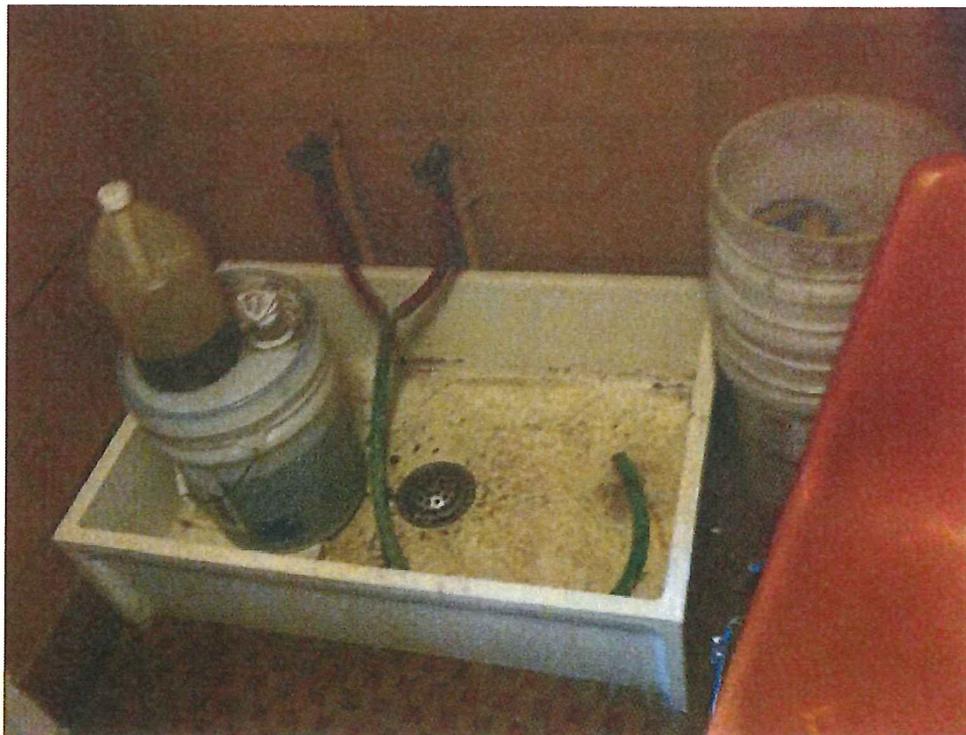
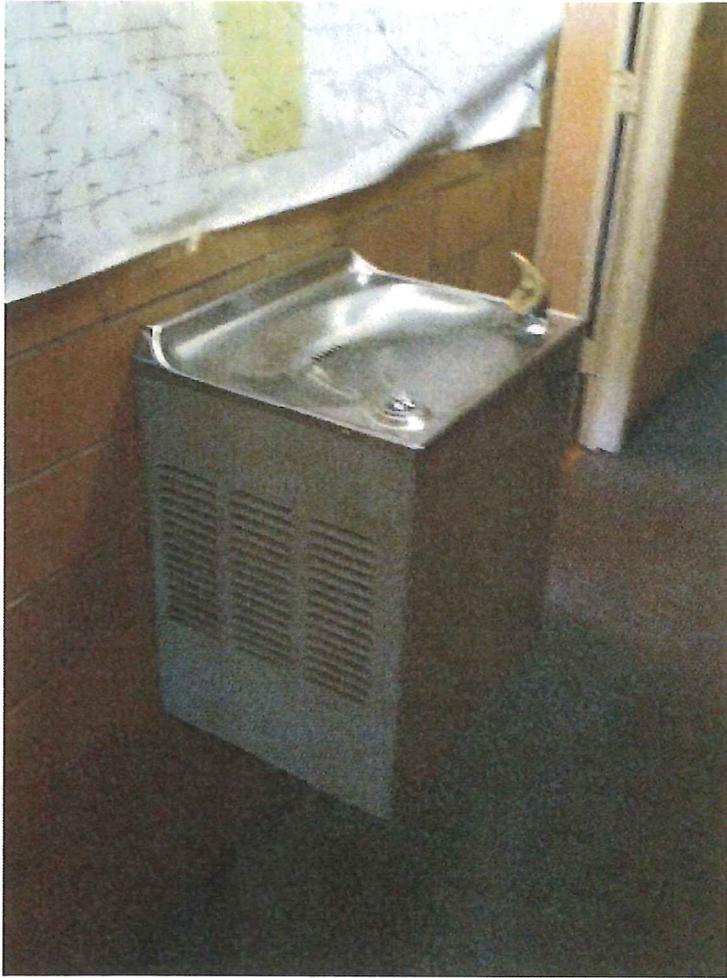


3. Aged Fixtures – The plumbing fixtures are all aged, and do not contribute to employee morale, or public expectation of the corporate image of the Eau Claire Fire Department. The janitor sinks need to have vacuum breakers installed to prevent backflow from the sinks, into the water potable system. Estimated cost of replacement with good quality, low flow fixtures - \$12,500









CONCLUSIONS

Due to deferred maintenance, and the overall condition of the HVAC, Electrical, and Plumbing systems, it appears that the cost of replacing and improving the systems to meet codes, and current needs will cost more than similar systems in a new building. Every system is dated, and beyond its normal life span, except for the carbon monoxide tubing system, which could easily be sold, or relocated to a new building

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