DRAFT

MECHANICAL, ELECTRICAL,
& PLUMBING CONDITION

REPORT

For the

Santa Fe Station
The City of Lawrence
LAWRENCE, KANSAS

Prepared for

Stan Herny Associates
920 Massachusetts Street
Lawrence, Kansas 66044

December 1, 2009

Steven C Hughes PE (KS)
President

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1.0 EXECUTIVE SUMMARY

1.1 GENERAL PROPERTY DESCRIPTION

Property Name: Santa Fe Station

Property Address: 413 East 7th Street
Lawrence, Kansas 66044

Observations By: Steven C Hughes PE

Observation Date: September 16, 2009

Evaluation Type: MEP Review Only

Property Type: Train Depot

Property Information:

- Size: 4,500± SF
- Age: 50± Years

Architect: Unknown

Topography: The site has a minor slope from south to north

1.2 CONCLUSIONS

The Santa Fe Station mechanical, electrical and plumbing systems were observed and found to be in fair to poor condition. It appears that most of the mechanical, electrical and plumbing equipment are pass their useful life and needs to be replaced.

The following is a summary of the recommendations for the building.

Mechanical, Electrical & Plumbing

- Replace the HVAC systems with properly sized, more efficient, and systems that provide outdoor air ventilation.
- Replace the older electrical distribution panels, provide additional convenience receptacles per code requirements, and retrofit light fixtures for more efficient lamps.
- Replace plumbing fixtures and configure to meet ADA guidelines.
- Install smoke detectors, emergency lighting, and exit signs.

Other minor recommendations are given in the report under each system type.

2.0 STATEMENT OF PURPOSE AND QUALIFICATIONS

2.1 PURPOSE

The purpose of the Mechanical, Electrical, and Plumbing (MEP) Condition Report is to describe the existing conditions of the mechanical, electrical, and plumbing systems in the building and observe the general condition of the mechanical, electrical, and plumbing systems for the building. No destructive testing was performed during this review of the building, site, and other improvements at the referenced location. The Report will identify those areas that will require remedial repair work and will assign them an associated estimated remedial cost.

2.2 AUTHORIZATION

Authorization to perform this report was given in the form of a verbal agreement. The work is performed under the terms of the Master Consulting Services Agreement between Stan Hernly Associates and Hughes Consulting Engineering, PA.

2.3 METHODOLOGY

This Report is based on a site visit, in which Hughes Consulting Engineering, PA performed a visual, non-intrusive and non-destructive evaluation of various mechanical, electrical, and plumbing components of the building. The Property Condition Report is not a building code, safety, regulatory, or environmental compliance inspection.

During the site visit we interviewed the available site personnel and/or property managers to add or confirm information. Architectural drawings and site documentation were available for our review to confirm the general character of the construction.

Photographs were taken to provide a record of general conditions of the facility, as well as any specific deficiencies observed.

This Report is based on the evaluator's judgment of the physical condition of the components, their ages and their expected useful life (EUL). It is understood that the conclusions presented are based upon the evaluator's professional judgment. The actual performance of individual components may vary from a reasonably expected standard and will be affected by circumstances which occur after the date of the evaluation.

The Report does not identify minor, inexpensive repairs or maintenance items which are clearly part of the property owner's current operating budget so long as these items appear to be taken care of on a regular basis. The Report does address infrequently occurring "big ticket" maintenance items, such as exterior painting, deferred maintenance and repairs and replacements which normally involve significant expense or outside contracting.

2.4 DOCUMENT REVIEW

A set of the original architectural drawings develop by The AT & SF Railroad Co dated 1955 for the station were available for review. There were also several mechanical and electrical drawings dated 1955 and 1982 that were reviewed.

2.5 INTERVIEWS

The following people or organizations were interviewed by Hughes Consulting Engineering, PA staff during the site visit or report preparation:

BNSF Employees who occupy the office area in the station.
Carrier Service Personnel, Ron (913) 894-5581 Ext 1782 and Ray Oktay

3.0 SYSTEM DESCRIPTION AND CONDITION

3.1 GENERAL DESCRIPTION

The property consists of a triangular-shaped site at the north east corner of 7th Street and New Jersey Street in Lawrence, Kansas. The property is improved with the single level train station that contains approximately 4,500 square feet. Main entrance is off of 7th Street to the southwest.
A site visit was performed on September 16, 2009, at which time the following visual observations were made:

3.2 SITE/SITE IMPROVEMENTS

3.2.1 Storm Water Drainage

The flat roofs on the train station drain to internal roof drains. The internal drain leaders within the building go below the floor slab. It is not clear where these drain leaders connect or discharge to the local municipal storm water system. It was noted that drainage appears to connect to the local municipal storm drainage system via underground piping to a storm sewer inlet on the northwest side of the site.

Observations/Comments: Drainage of the site appears to be adequate with no apparent areas of ponding.

3.2.2 Lighting

The site lighting was observed to consist of wall-mounted fixtures and recessed fixtures in the canopy areas. There are also some street lighting in the public streets that light the site.

Observations/Comments: The exterior light fixtures appear to be in fair to poor condition and should be replaced. Funds have been allocated to retrofit or replace the exiting fixtures with more efficient lamps.

3.3 MECHANICAL, ELECTRICAL, & PLUMBING

3.3.1 HVAC Systems

The heating, ventilation, and air conditioning (HVAC) system for the train station consist of two separate systems, one for heating and one for cooling. The heating system consists of a hot water boiler that provides hot water to several fan coil units and under floor radiant heating system. The cooling system consist of two packaged floor air handling units, one in the lobby and one in the

baggage area, that are fed with condenser water from an open forced draft cooling tower on the passenger platform on the north side of the building.

Heating is provided by five *Trane* fan coil units connected to a *Hydrotherm* water tube natural gas fired boiler and by radiant floor heating. The fan coil units provide heat to the restrooms, air locks, and lobby, while the radiant floors serve the rest of the building. The *Hydrotherm* boiler is approximately 25 years old. Hot water is circulated to the fan coil units and the under floor radiant heating by three pumps located in the boiler room. These pumps include a ½ HP B & G Pump, a 1/6 HP B & G Pump and a ½ HP GPM B & G Pump.

Cooling is provided to the lobby and surrounding areas by a *Trane* 7 ½ ton package floor air handling unit that is fed by condenser water from a *Marley* forced draft cooling tower located on the north side of the building on the passenger platform. Cooling is provided to the baggage room and surrounding areas by a *Trane* 10 ton package floor air handling unit that is also fed by condenser water from the cooling tower. The cooling tower is a *Marley Aquatower* and is 6 years old. Condenser water is circulated from the cooling tower to the floor air handling units by a *B&G* 1.5 HP 125 GPM pump located in the boiler room.

Observations/Comments: A review of the original 1955 design drawings appear to indicate the station was maybe designed as a heated only building and the cooling was an add since none of the cooling equipment is illustrated in the original 1955 drawings provided. Heating was originally provided by a medium pressure steam fire tube natural gas fired boiler located in the boiler room. The boiler provided steam to a steam to hot water converter that then provided hot water to the under floor radiant heating system, fan coils in the air locks, and also provided steam to "setout car" to the east via a 2" steam line, which is still in place but not longer connected to any steam source. Cooling was provided by two package floor units with condenser water supplied from a cooling tower located on the passenger platform on the north.

The old steam boiler and the steam to hot water converter have been removed and the boiler replaced with a natural gas fired hot water boiler that provides heating to the station. It was reported by employees that the under floor radiant system is still operational in the office portion of the building and the baggage portion. This was obvious for the baggage room and the general offices and ticket office since there are no other means of heating in these areas of the station. It appears from drawings dated 1982 that some of the radiant floor heating was disconnected and abandon and replaced with fan

coil units. Floor radiant heating system in the waiting area was observed to be working. Carrier service personnel indicated that they were concern with the integrity of the under floor radiant system and indicated they would not touch it for fear of causing a leak and disabling the system. This is also true for the controls for the heating system which appear to be operating in fail safe condition. There are five fan coil units in the station that provide heating in the two air locks (vestibules), restrooms and the main waiting area. The fan coil units appear to not have been a part of the original construction.

The floor package air handling units located in the main waiting area and in the baggage area have reached the end of their useful life and should be replaced with more efficient and reliable systems. It also appears that the controls for these units are not operating in an efficient manner. The cooling tower that provides condenser water to the floor package air handling unit appears to have some rust and corrosion associated with the basin. It is proposed that the floor package units be replaced with ground source heat pumps. It might be possible to install the ground source heat pump within the shell of the original package floor unit in the station waiting room. Another option would be to replace the floor package units with heat pumps with air cooled condensers mounted outside or the ground or on the roof. Based on the installed cost of the ground source heat pump system and expected 30% higher efficiency than the air cooled condensers heat pumps, the ground source heat pumps are expected to have a quicker pay back than the air cooled condenser heat pumps. Due to the poor operation of the current controls the actual pay back is difficult to determine.

The hot water heating system is old inefficient and the system is close to or beyond its useful life. The current system does not appear to have any controls that work. It is recommended that the heating system be kept as is until it fails. The heating for the depot can be incorporated into the new ground source heat pumps. We may want to keep the under floor radiant system in operation for as along as possible, but have a means in place for heating the station once the under floor radiant system fails. The heating for the depot can be incorporated into the new ground source heat pumps.

The current boiler should be replaced with amore efficient unit, along with operational controls. Proposed system would be for a small wall mounted condensing type hot water boiler. This would allow hot water to still be supplied to the under floor radiant heating system and the fan coil units in the air locks.

3.3.2 Electrical Systems

The building's electrical system consists of underground service from utility owned pole mounted transformers on the south side across the street. The station has a single meter located in the boiler room along with the CT cabinet. The service for the station is a 124/240 volt three phase high leg type service. The main distribution panel located in the hallway has a 400 amp 120/240 volt 3 pole disconnect. See Photo #23. There are three sub-panels that provide power to the light fixtures and mechanical equipment. There are breakers in the main panel for the floor package units located in the lobby and the baggage room.

Interior lighting in the station is a combination of florescent and incandescent fixtures throughout the building. Light levels appeared to be adequate for the most part.

Observations/Comments: The power distribution system for the building is original. Based on the age of the breaker panels and the potential difficulties in getting replacement parts for this equipment and the possibility that the system might not work when needed, it is recommended that the power distribution panels be replaced with new equipment. The main distribution panel should be moved to a location that is not accessible to the public. The existing panel could be retained in its current location as a historical artifact with labels indicating that. The main distribution panel can be moved to the boiler room with new distribution wiring run to the new replacement sub panels and the floor package units.

The lighting system appears to be adequate but should be up dated to a more energy efficient system with the replacement of the older T12 40 watt fluorescent fixtures with newer T8 32 watt fluorescent fixtures. It was noted that many of the older incandescent light fixture have compact fluorescent lamps in them. Some of these do not appear to provide adequate lighting from the fixtures and the fixtures should be replaced with fluorescent fixtures with the proper sized lamps for better lighting. It appears that the existing fixtures can be retrofitted with new energy saving ballasts and holders for the more efficient T-8 lamps. We may want to look at installing ballast that allow for dimming of the lamps in the waiting area due to the large number windows in the waiting area.

It is proposed that photovoltaic be placed on the flat roof to provide some of the power to the building during the day. It is proposed that a 5 to 6 kW system be installed on the roof. It is estimated that approximately 800 kWh per month could be supplied by this system. Based on this size system and the approximate installed cost of $35,000 the system would pay for itself in 37 years or 12 years if only 35% of the install cost is used.

3.3.3 Piping Systems

The sanitary lines in the building were not observed due to hidden conditions. It is assumed that all sanitary piping is cast iron based on the materials used for the vent piping. It appears from the local municipal sanitary lines in the area that the sanitary line for the building goes to the south. Sanitary lines to the north across the railroad tracks were installed when the station was built in 1955.

Domestic water enters the building on the east side in the baggage/freight area through an 11/2" line with a lever handle shut off. Domestic hot and cold water is supplied through copper lines.

The plumbing fixtures include two wall mounted flush valve type water closets, urinal, and wall mounted lavatory in the men's restroom and two wall mounted flush valve type water closets and two wall mounted lavatories in the women's restroom. There is also a service sink in the janitor's closet and two other wall lavatories located in the ticket office and the station agent's office.

Building is served by steel natural gas lines fed from a 1000 CFH meter located in a pit on the south side of the station next to the freight office entrance. The gas lines serve the boiler and the water heater.

Observations/Comments: The piping, where observed, appears to be in satisfactory condition. No lack of capacity, drainage or plumbing problems were observed. The plumbing fixtures appear to have reached the end of their useful life and need to be replaced with new low water usage fixtures.

Domestic water pressure appears to be adequate.

3.3.4 Domestic Hot Water

Domestic hot water is supplied to the restrooms, janitor's service sink and several office located lavatories by an *A.O. Smith* Promax 40 MBH 40 gallon natural gas fired water heater located in the janitor's closet. See Photo #19 The water heater was replaced in January 2009.

Observations/Comments: The water heater at the station is approximately 10 months old and should have an estimated useful life of 10 to 15 years. It is expected that the water heater will not need to be replaced in the near future.

3.3.5 Fire Suppression Systems

No fire sprinkler system was observed in either building.

3.3.6 Life Safety Systems

Fire protection is provided by a hand-held fire extinguishers in the station. Fire extinguishers were last inspected in August 2009.

Observations/Comments: The fire protection for the building is inadequate by today standards with the lack of smoke detectors, exit signs and emergency egress lighting. Funds should be budgeted to update the life safety systems in the building. This would include smoke detectors, exit signs, and emergency egress lighting. It may be wise to install an automatic fire sprinkler system to protect the building once it is renovated.

3.3.7 Security System

The building is not equipped with a surveillance or security system.

4.0 ADDITIONAL INFORMATION

4.1 WARRANTY

The recommendations and conclusions submitted for the subject project are based on available information and details furnished by interviews with property manager and the tenants. The observations and recommendations presented in this report are time dependent, and conditions will change. The findings in this Report are not based on a comprehensive engineering study. During the site visit Hughes Consulting Engineering, PA did not perform any destructive tests or operate any specific equipment.

Hughes Consulting Engineering, PA warrants that these findings have been promulgated after being prepared in accordance with generally accepted practice of the construction industry. No other warranties are expressed or implied. Our observations and resulting report are not intended to warrant or guarantee the performance of any building components or systems.

4.2 USE BY THIRD PARTIES

This report was prepared pursuant to the contract Hughes Consulting Engineering, PA has with Stan Hernly Architects. Because of the importance of the communication between Hughes Consulting Engineering, PA and Stan Hernly Architects, reliance or any use of this report by anyone other than Stan Hernly Architects and it lender(s), this report is not for the use or benefit or, nor may it be relied upon by, any other person or entity without the advance written consent of the Consultant.

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APPENDICES

APPENDIX A

Photographs

Photo #1 View of six year old Marley cooling tower located on the platform on the north side of the station.

Photo #2 View of some rusting that is occurring on the cooling tower around the basin.

Photo #3 View of condenser water pump that circulates condenser water from the cooling tower to the two floor air handling units in the station.

Photo #4 View of Hydrotherm 400 MBH water tube hot water boiler in the boiler room.

Photo #5 View of one of three hot water circulating pumps that distribute hot water to the under floor heating system and several fan coil units.

Photo #6 View of one of the three control valves located on the ceiling of the boiler room.

Photo #7 View of heating only fan coil unit with front cover removed located in the main lobby of the station.

Photo #8 View of the 1 HP fan in floor air handling unit with cover removed located in the main lobby.

Photo #9 View of compressor in the lobby area floor air handling unit.

Photo #10 View of 7.5 ton floor air handling unit located in the main lobby area.

Photo #11 View of 10 ton floor air handling unit located in the baggage area.

Photo #12 View of small hot water convection unit in one of the restrooms.

Photo #13 View of hot water convection unit in one of the air locks for the station.

Photo #14 View of older thermostat controlling air lock hot water convection unit.

Photo #15 View of supply air diffuser with ductwork in soffit in the main lobby of the station.

Photo #16 View of older thermostat for one of the floor air handling units.

Photo #17 View of 1000 CFH natural gas meter serving the building located in a pit on the south side of the station.

Photo #18 View of the maim water service shut off on the east side of the station.

Photo #19 View of six month old 40 gallon 40 MBH natural gas fired water heater serving the restrooms and the lavatories located in the offices.

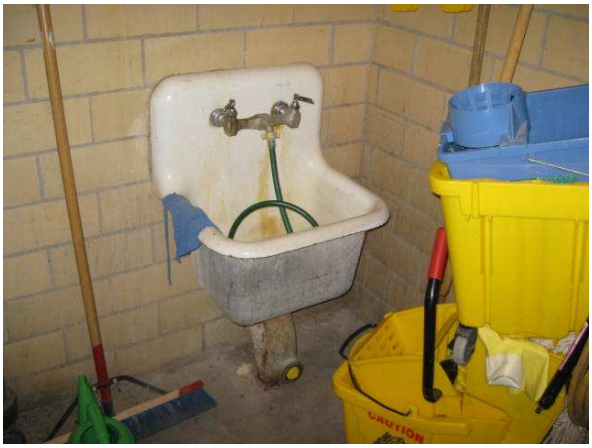

Photo #20 View of service sink located in the janitor's closet.

Photo #21 View of urinal and wall hung lavatory in the men's restroom.

Photo #22 View of typical wall hung water closet with flush valve in the restrooms.

Photo #23 View of typical lavatory in office and ticket office.

Photo #24 View of internal roof drain.

Photo #25 View of utility meter for the 120/240 volt 3 phase high leg electrical service located in the boiler room.

Photo #26 View of CTs in cabinet next to meter in the boiler room.

Photo #27 View of 400 amp 120/240 volt 3 phase Westinghouse main electrical distribution panel for the station.

Photo #28 View of typical lighting fixtures in the public and office areas of the station. Includes both fluorescent and incandescent fixtures.

Photo #29 View of incandescent fixtures in the baggage area of the station.

Photo #30 View of some of the building mounted light fixture along the platform next to the boiler room entrance.

Photo #31 View of recessed lighting in the air lock.

Photo #32 View of recessed lighting in the canopy over the platform.

Photo #33 View of building mounted lighting on the south side of the building.

Photo #34 View of sign on the station with damaged neon lighting.

Photo #35 View of light fixtures in office area, note soffit with supply air diffuser.

Photo #36 View of platform with recessed lighting.