
AFD
STATION
8

A2 Services, Inc.
Facility Survey of the City of Alexandria Fire Station #208

A2 Services (A2) toured City of Alexandria Fire Station #208 on September 27, 2017. The station is located at 175 North Paxton Street in Alexandria VA. Upon arriving at 0700AM A2 met Captain Lynn and Lieutenant Europe who explained the site concerns related to the facility. Following the initial discussions, Fireman Bobby Kennedy escorted A2 throughout the site.

This Fire Station was built in 1976 and has had no other additions to it except a new wet pipe sprinkler system which was installed in 2002. This facility is in good condition as compared to some other jurisdictions A2 has surveyed. The following were the facility concerns identified during the visit and correspond with Attachment 1 of the Report:

Mechanical Findings:

1. Fire Department Engine Bays have Truck Exhaust Systems. The purpose of this system is to remove the engine exhaust from the Engine Bay area while the trucks are running and warming up. In theory this system should be able to allow the bay doors to be closed while the trucks are running on cold days or in bad weather while also maintaining acceptable indoor air quality for the firemen. The system being used is a small wall mounted exhaust fan and a set of fresh air dampers at the rear of the bay. The concern is that this system isn't sized to move enough air to actually accomplish its purpose. Because of this the doors are being opened to keep the engine bay clear of fumes. On very cold days this allows the bay area to also become quite cold. Other Fire Departments use air vacuum systems which have hoses suspended from the ceiling and hook up to the truck exhaust pipes. The truck exhaust is then removed to the outside through a fan system. This system would be a better approach than the one in use at this time.

2. The Engine Bay Heating System uses ceiling hung electric unit heaters. These electric units can maintain a good temperature within the bay while the doors are closed but cannot keep up with the doors open. The installation of 3 new gas fired infra-red heating units would make it much more comfortable for the firemen when the doors have to be open in very cold weather. The installation of a new Engine Exhaust Air Vacuum system for the trucks would possibly eliminate this issue allowing the doors to stay closed more often.

3. The other areas of the fire station are heated and cooled by several separate systems. There are variable refrigerant flow split systems, and several package split systems. These units all have air cooled refrigerant condensing coils on the outdoor units which require good air flow to maintain their efficiency. After inspection of these coils we found that they need to be properly cleaned. This should be done at least once a year with a non corrosive coil cleaner and then rinsed down with clean water.

4. The mechanical room on the lower level and at the rear of the building houses one of the main heating and cooling indoor air handling units, the domestic hot water heater and the emergency generator. A wall mounted exhaust fan is used to cool this room in summer. The backdraft damper for this fan is coming apart and will fail. This damper closes when the fan shuts down and stops windblown rain or cold air from entering the room from outside. This dampers assembly needs to be replaced soon.

5. The outdoor refrigerant piping insulation on the variable refrigerant flow systems is damaged. Good insulation is critical to allow these systems transfer heat back and forth between the indoor and outdoor units. The damaged insulation also increases the energy usage required to condition the space. The Armor-flex insulation is a good product but it does not stand up well to outdoor weather conditions and should have been wrapped with a protective vinyl cover. This damaged insulation should be replaced and the entire run of outdoor refrigerant pipe then covered with a proper vinyl protective wrap.

6. The weight room indoor heating and cooling unit is controlled by a thermostat on the wall by the door into the storage area next to the weight room. This t-stat also controls another unit in the store room next door. The storage area next to the weight room has 3 different heating and cooling systems which tend to fight each other. A2 recommends that one new thermostat be installed on the storage room unit that is controlled by the t-stat in the weight room. This would allow better control of the space temperature in the storage areas next door.

Electrical Findings:

7. The site has a small natural gas fired emergency generator which handles lights and critical equipment only. The generator battery charger is unplugged and may have failed. This should be investigated to make sure the battery has sufficient power to start the generator in an emergency.

8. All the Fire Stations that A2 has surveyed in the past are considered and designed to be a fully functional mission critical facility. This basically means that when to utility power goes down, the fire station is still fully functional and includes all heating, cooling, lights, wall outlets, and all critical communications equipment. Everything still operates as if the utility power was still on. A2 recommends that Alexandria City consider upgrading their emergency power systems to allow this.

9. The emergency generator and its emergency transfer switches are not being tested under load. This is normally done in critical facilities on a monthly basis to identify any problems before an actual emergency event occurs. A2 recommends that these testing procedures be put into place.

10. The main electrical panel and breakers panels at the site do not appear as if they are being tested and serviced. All electrical systems, especially in critical facilities should be thermally scanned with an infra-red camera to identify any overheating components or loose connections. This testing will identify such issues before they cause a failure of the electrical system. A2 recommends that all electrical gear be opened, thermally scanned then cleaned and all terminations checked of tightness on an annual basis. This an important risk management task that should be implemented.

Structural Findings:

11. The engine bay roof is leaking onto the trucks. This issue has already been identified by the fire department staff. A2 was told that the roof repairs are being scheduled for repair.

12. The main firemen's gear room is located just off the rear of the engine bay. The skylight in the ceiling is leaking onto the equipment and gear. We recommend that the skylight be repaired.

13. The stairwell at the rear of the engine bay also has a skylight which is leaking. This one is not as bad as in the gear room but should also be repaired in unison with the gear room repair to save costs.

14. The main concrete driveway into the engine bay has one bad broken area on the right as you drive out. This should be repaired before rain or water gets under the damage and freezes causing the damage to increase.

15. The asphalt parking lot and driveway areas at the side and rear of the building are in poor condition and cracked up badly. This is another situation where water getting into the cracks will freeze and increase damage. A2 recommends that this be at least liquid sealed before the damage increases.

Attachment – 1 – Photos of each finding

Photo # - 1. This picture is of the wall mounted engine exhaust fan which removes the truck exhaust fumes from the engine bay.

Photo # - 2. This picture is of one of the main electric unit heaters which heat the engine bay area.

Photo # - 3. This picture is of one of the VRF condensing coils which needs to be cleaned. Clean coils on an air cooled split system is critical to efficient heating and cooling.

Photo # - 4. This picture is of the mechanical room exhaust fans backdraft damper which is falling apart.

Photo # - 5. This picture notes the refrigerant piping where the thermal insulation has failed. The white sections need to be replaced and then all the all the outdoor piping needs to be wrapped in vinyl.

Photo # - 6. This picture is of the thermostat for the weight room which also controls the unit next door in the storage area. Installing one new t-stat on the unit next door will help control temperatures in both areas.

Photo # - 7. This picture is of the power disconnected from the emergency generator battery charger.

Photo – 8 and 9. This picture is of the gas fired emergency generator. This is not sized to handle the whole facility and has not been tested under load.

Photo # - 10. This picture is an example of one electric panel which should be thermally scanned, cleaned and tightened up annually.

Photo # - 11. This picture is of the engine bay ceiling area where the roof is leaking.

Photo – 12. This picture is of the firemen's equipment and gear room skylight which is leaking on the equipment.

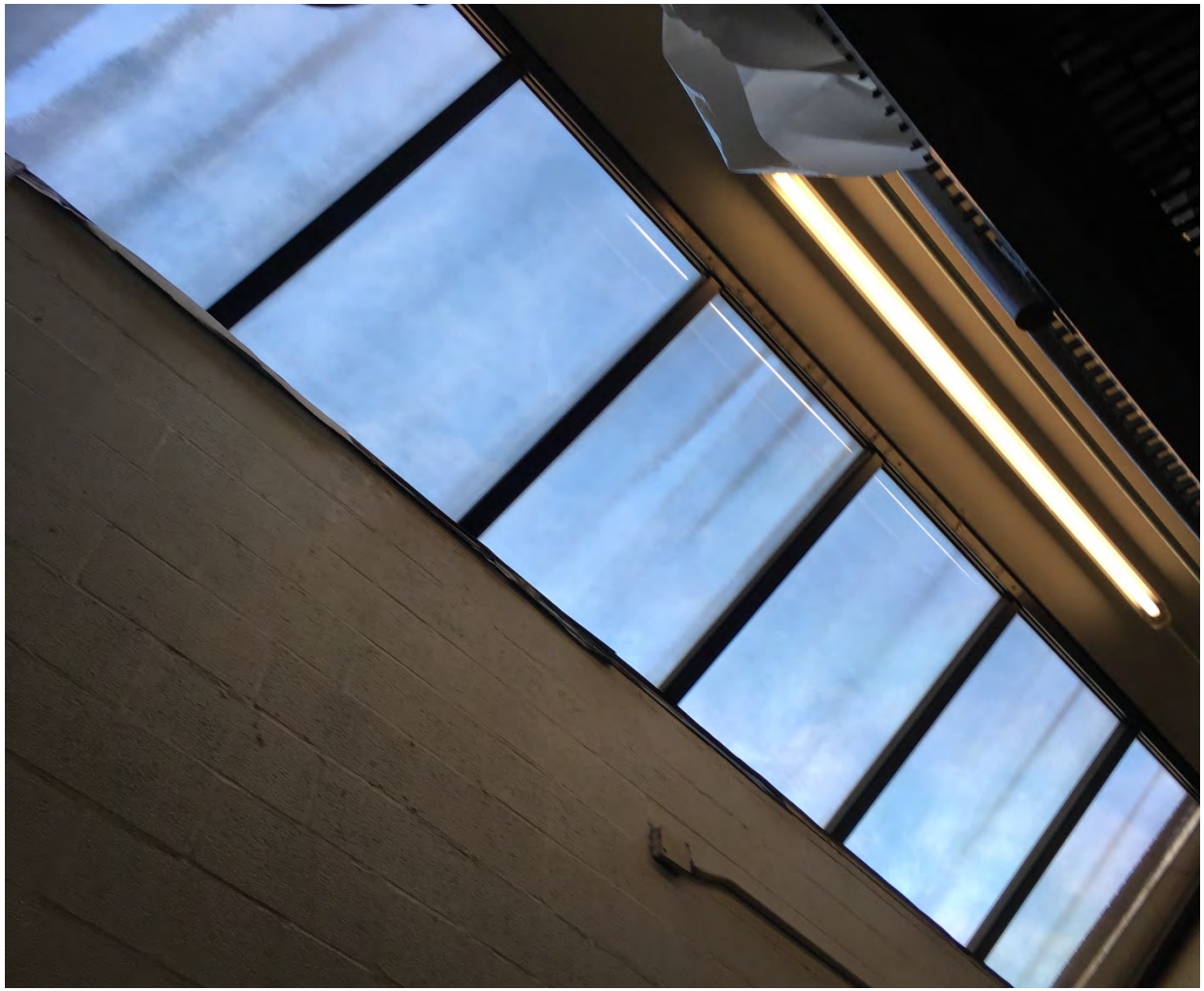

Photo – 13. This picture notes the second skylight in the stairwell which is also leaking.

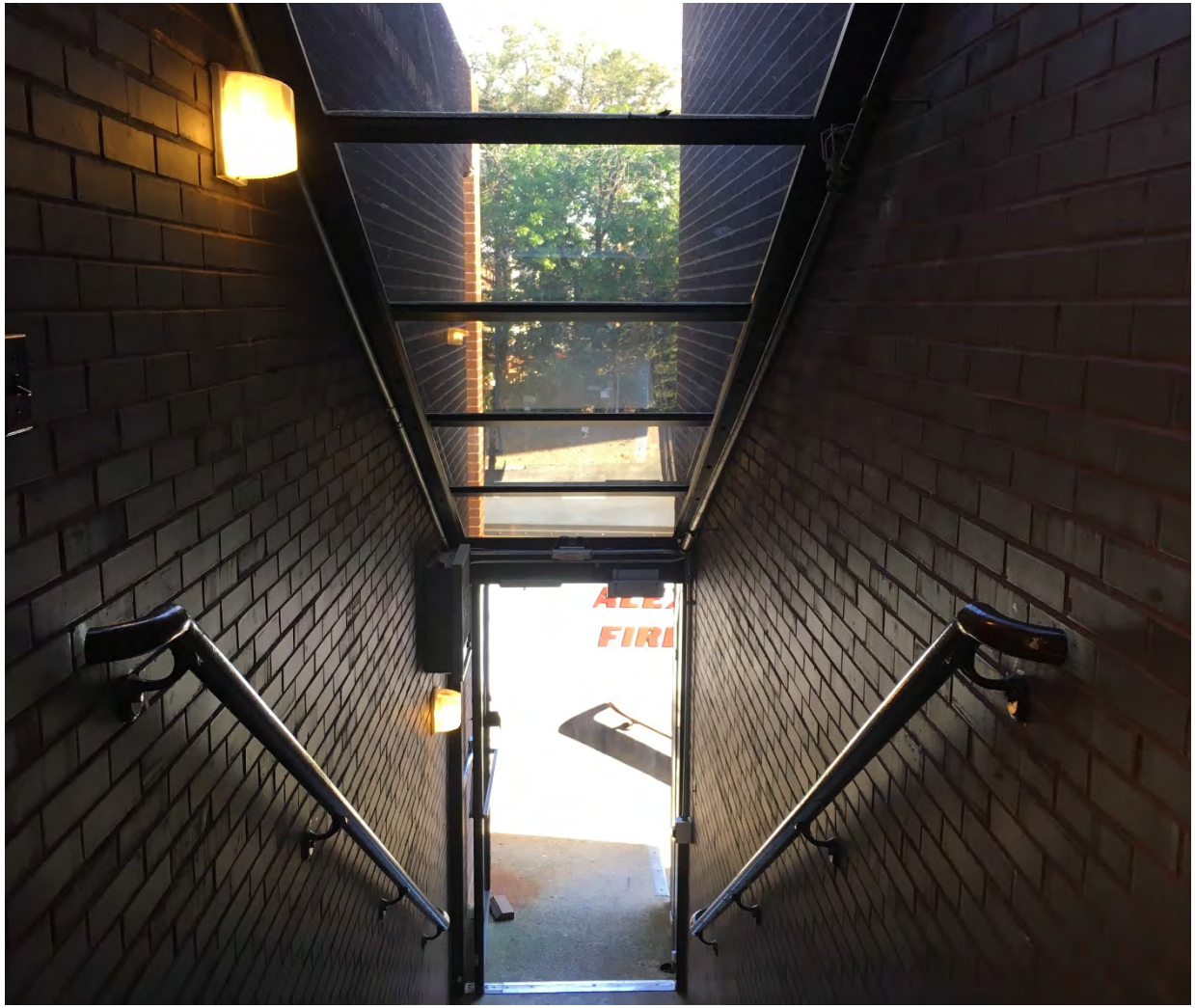

Photo – 14. This picture notes the concrete driveway damage which will need repair.

Photo – 15. This picture is an example of the cracked and damaged asphalt at the parking lot area.

Issues / Deficiencies List

Name of Facility:		Alexandria Fire Station # 8	
Photo	**#**	**Description of Deficiency/Issues**	**Location - Floor/Room**
MECHANICAL	1	The engine bay exhaust system used is simply a wall mounted exhaust fan and a fresh air damper to ventilate the truck engine exhaust fumes. They do not have the standard Air Vacuum exhaust removal systems to reduce C02 in the bay. This is an operational and IAQ concern.	Engine bay
	2	The engine bay heating system uses ceiling hung electric unit heaters. These probubly keep the bay warm with all the doors closed but not with the doors open. Recommend ceiling hung gas fired infra-red heating units like they have in the back of the bay. This would heat much better and be more efficient than the electric.	Engine bay
	3	The outdoor condensing units should have their coils cleaned. They are fairly dirty at this time.	Rear and side of building
	4	The mechanical room exhaust fan backdraft damper is coming apart and should be replaced.	Rear of building
	5	The variable refrigerant flow units piping insulation is damaged and will need to be replaced.	Side of building
	6	The thermostat in the weight room controls the weight room unit and the one next door in the storage area. This causes the other systems in the storage area to fight each other. Recommend that the storage room have a separate new T-stat installed and the stat in the weight room would only control that area.	Weight room
Photo	**#**	**Description of Deficiency/Issues**	**Location - Floor/Room**
ELECTRICAL	7	Emergency generator battery charger is not operating. This should be corrected to make sure the battery has the power needed to start the unit on loss of utility power.	Mechanical room
	8	The emergency generator doesn't have the capacity to operate the entire facility on loss of power. Most of the fire departments I have surveyed are considered Mission Critical and all the internal building systems function as if they never lost power	Mechanical room
	9	The emergency generator system is not being tested under load. This should be done on a regular basis to verify the power transfers to the generator on loss of ulility power.	Mechanical room
	10	It doesn't look as if proper electrical maintenance is being performed. Annual Infra-red testing, cleaning and tightening of electrical terminations should ongoing.	Mechanical room

Issues / Deficiencies List

Photo	#	Description of Deficiency/Issues	Location - Floor/Room
PLUMBING			

Photo	#	Description of Deficiency/Issues	Location - Floor/Room
STRUCTURAL	11	The engine bay roof leaks. I am told that it is scheduled for replacement.	Engine bay
	12	The gear room skylite leaks down onto the firemans gear below. The skylight need to be reasealed.	Gear room
	13	The stairwell skylite at the rear of the engine bay also leakes and will need to be repaired.	Front Driveway
	14	The main engine bay concrete driveway has a bad cracked and broken area on the north side near the sidewalk. Once water and ice get under this damage it will worse the repair costs.	Next to engine bay
	15	The parking lot and other paved areas in the rear of the building are cracked up badly and should be repaved.	Rear and side of building

Photo	#	Description of Deficiency/Issues	Location - Floor/Room
ARCHITECTURAL			