

# AUBURN RIVERSIDE HIGH SCHOOL HVAC System Assessment





March 11, 2021

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Auburn Riverside School HVAC System Assessment Report March 11, 2021 Page 1

## **SCOPE**

Metrix Engineers was hired to perform an assessment of the existing heating, ventilation and air conditioning systems at the Auburn Riverside High School site in Auburn School District. The goal of the assessment was to provide an executive summary level of detail regarding the type and condition of the existing mechanical systems, determine if the systems are operating in compliance with their original design intent, and identify any areas of improvement based on site observations.

Auburn Riverside High School that was constructed in 1997. The two-story main building is approximately 180,000 square feet and the site also includes a Field House and portables.

A site walk was conducted on March 8, 2021 to review the existing mechanical systems. This report summarizes Metrix observations based on that visit.

#### **EXECUTIVE SUMMARY**

The building appears to be operating per its original design intent. No major operating points of concern were observed and there are no spaces that have been modified such that the original design intent isn't still appropriate for the new space usage.

## **EXISTING SYSTEM OBSERVATIONS**

#### HVAC:

A central gas fired boiler plant comprised of two 5,230 MBH gas fired boilers is located in a dedicated boiler room. Heating water is distributed to the building via two central system pumps. A 150-ton and a 125-ton air cooled chillers are located on grade at the exterior near the boiler room. Two central system heating pumps and two central system pumps located in the boiler room distribute heating and chilled water throughout the building off a primary/secondary plant hydronic loop.

Heating, cooling and ventilation at the general classrooms and administration spaces is provided by a central variable air volume (VAV) system air handlers with VAV terminal units serving each zone. All equipment is located in mechanical attic spaces. Dedicated air handling units provide heating, cooling and ventilation to computer labs, music spaces, and gym spaces. Heat recovery units serve Gym auxiliary spaces and Locker Rooms.

A spot check of various HVAC system components was completed during the site visit, including the internals of various air handling units and heat recovery units. All heating and ventilation systems checked were verified operational with no major issues noted. Slow dripping leaks (not enough to cause building damage or mold concerns) were observed at the control valves of the following units:

• AHU-801 and VF-203, 606, 705 and 802

Note 1

- There were a number of spaces where the space type changed from original design, and they are listed below, however the design ventilation has been verified to be sufficient for the current use of the space.
  - In Area C Admin a Storage Room was increased in size and Records room removed to accommodate. No concerns observed.
  - 6-seats were observed in the Library Office Space potentially inferring the space is being used as a work or conference room space. Ventilation rates were confirmed adequate for this increased occupancy.



Auburn Riverside School HVAC System Assessment Report March 11, 2021 Page 2

- Desks were observed in the Library Periodicals space. Ventilation is adequate for occupant office use.
- Resources room in Area D was converted into an Office. Ventilation is adequate.
- The Greenhouse adjacent Classroom 208 in Area E has been converted into a pottery space. Ventilation is adequate provided the exhaust fan in the space is operated when occupied.
- The Dark Room in Area F has been demolished and opened up to the main classroom space. No concerns observed.
- The Audio room adjacent Visual Communications in Area F of the original design has been converted into a keyboard practice room. Ventilation is provided and confirmed adequate.
- Storage Room 520 in Area G has a desk and may be partially utilized as a temporary office space. The ventilation is adequate for occupant office use.
- Second floor Storage Room 706 in Area 2E is now also serving as an IT closet. No concern observed

#### **Controls:**

Building automation system controls are old Barber Coleman Network 8000 direct digital controls.

A review of the Building Automation System and outside air damper setpoints was conducted and all systems and spaces appear to be meeting or exceeding design outdoor airflow ventilation rates.

During control system review the following system deficiencies were identified:

•	EF-22 and EF-41 commanded on but status was off	Note 2
•	Room 038, 602, 714, 718, 724, 806, 807 and 809 terminal units had heating coils commanded to 100% but no increase in supply air temperature inferring control valve is in a failed closed	Note 3
_	position.	Note 4
•	Room 805 terminal unit not at setpoint but neating coil commanded to 0%.	
•	Room 035, 207, 348E, 402, 403, 409, had parallel fan powered box primary air dampers	
	commanded to 100% open. Spaces were having trouble maintaining setpoint with heating valve also commanded to 100% open.	Note 5
•	Room 707 heating coil valve at 0% open, SAT at 58F and space temp reading 95F. Space sensor assumed to be inaccurate.	Note 6
•	Terminal units serving Corridor in Area D get assigned to wrong graphical VAV box. These spaces also appeared to be under setpoint and were assumed to have similar 100% commanded primary air damper position.	
٠	FC-2 and FC-3 were commanded in occupied with valves at 100% open but fans stopped.	Note 7
•	FC-4, FC-5 and Room 071 and 713 terminal units could not establish BAS communication.	
•	AHU-4 was in occupied mode but stopped. Space setpoint not satisfied and valved command	Note 8
	was at 0%.	Note 9
٠	EF-102, EF-404 and EF-807 fan failure	Note 10
•	UH-8 in Boiler Room commanded to maintain 55F but only maintaining 48.5F.	11010 10

During control system review, only one space temperature deficiency was identified outside of the equipment locations above. The control system appeared to be responding as desired, so it is unclear why the following spaces were not at setpoint; this potentially infers a door or window may have been ajar on the on the day of review when OAT was observed at 39F:

• Room 328 terminal unit





# Riverside High School HVAC System Assessment Notes

Note	Additional		Estimated	Final Completion
	Notes		Completion Date	Date
1		Submit work request	3/17/21	3/17/21
	1.1	WO 1-358822 to 1-358828	4/5/21	4/30/21
2		Submit work request	3/17/21	3/17/21
	2.1	WO 1-358865 to 1-358866	4/5/21	5/3/21
3		Submit work request	3/17/21	3/17/21
	3.1	WO 1-358829 to 1-358836	4/5/21	4/30/21
4		Submit work request	3/17/21	3/17/21
	4.1	WO 1-358837	4/5/21	4/30/21
5		Submit work request	3/17/21	3/17/21
	5.1	WO 1-358838 to 1-358843	4/5/21	4/30/21
6		Submit work request	3/17/21	3/17/21
	6.1	WO 1-358844	4/5/21	4/30/21
7		Submit work request	3/17/21	3/17/21
	7.1	WO 1-358845 to 1-358846	4/5/21	5/3/21
8		Submit work request	3/17/21	3/17/21
	8.1	WO 1-358847 to 1-358850	4/5/21	5/3/21
9		Submit work request	3/17/21	3/17/21
	9.1	WO 1-358851	4/5/21	5/3/21
10		Submit work request	3/17/21	3/17/21
	10.1	WO 1-358852 to 1-358854	4/5/21	5/3/21

Revision Date 5/3/21