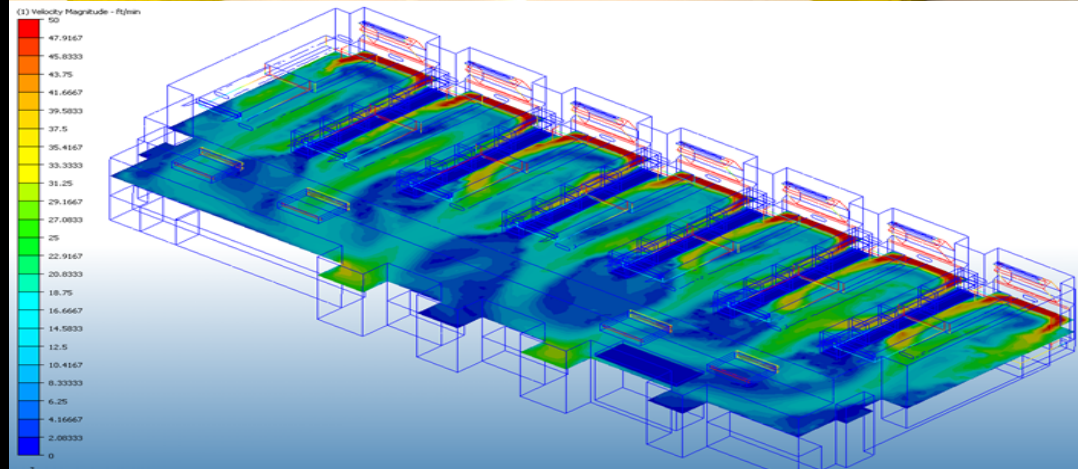




Campus Wide HVAC Upgrades



PRESENTERS



■ Brian Santos

- Building Committee Member
- Owner of W.T. Rich Company
- 25+ Years in Construction
- Has Constructed over 1 Billion Dollars worth of School Projects



■ Bill Birch

- Director of Facilities
- Building Committee Member

■ Paul Fiejdasz, PE

- Mechanical Eng
- H. F. Lenz
- 30+ years in K-12 facility assessments and building design



■ Scott Kraynak, PE

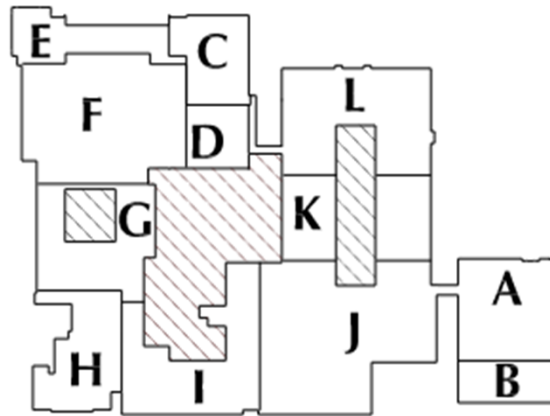
- Project Engineer
- H. F. Lenz
- 20+ years in K-12 facility assessments and building design



FACILITIES HISTORY



- Thompson Public Schools Pre-K to 12 educational campus consists of four interconnected buildings, for a total of 405,000 sq. ft. of space.
- High School
 - 2008 Renovation – Systems in fair condition
 - 1988 Renovation – Systems at end of life.
- Middle School
 - 2008 Upgrades – Systems in fair condition.
 - 1978 Addition – Systems at end of life.
- Elementary School
 - 1978 Portion – Systems at end of life.
- Administration & Museum Building
 - 1908 Original Construction – Systems at end of life.



PROJECT BACKGROUND



- July 2022 – District contracts with H. F. Lenz (HFL) to perform building assessments and recommendations for upgrades.
- August 2022 – HFL commences review of existing system designs and equipment condition assessments.
- October 2022 – HFL provides draft Programming Narratives with assessments and recommended equipment upgrades.
- October 2022 – State announces reimbursement program for districts to improve Indoor Air Quality (IAQ) within existing schools.
 - State allocates \$75M, quickly increases to \$150M in program funds available for distribution.
- November 2022 – Building Committee and HFL re-work submitted narratives to submit a Phase 1 scope of work for grant submission purposes, with remaining recommendations pushed to Future Phasing.



RESEARCH & INVESTIGATION

- Existing drawings obtained from district and reviewed for understanding of initial system design and intended operations.
- Site investigations conducted at all schools, observing operations of equipment and assessing current condition of equipment.
- Review of findings, analysis of existing equipment conditions, prioritizing of potential upgrades.
- Report provided to district with summary of findings and recommendations.



CAMPUS WIDE OBSERVATIONS

- The primary HVAC system deficiency in many parts of the school campus is inadequate Outdoor Air (OA) ventilation to interior spaces.
- Seven separate boiler rooms utilized to serve various sections of campus.
- Boilers designed with a +7F Outdoor Air Temperature, thus numerous spaces under-heated during typical cold winter days.
- Obsolete pneumatic controls (1970s Technology) still deployed within district.



EQUIPMENT OBSERVATIONS



- A portion of High School Equipment at end of useful life after 35 years of operations.
- Middle School has the originally installed 1978 vintage Unit Ventilators, well beyond useful life at 45 years and in need of replacement.
- Middle School Boilers beyond useful life and in need of replacement.
- Elementary School Cafeteria Heating & Ventilation Unit installed in 1978 is well beyond useful life.

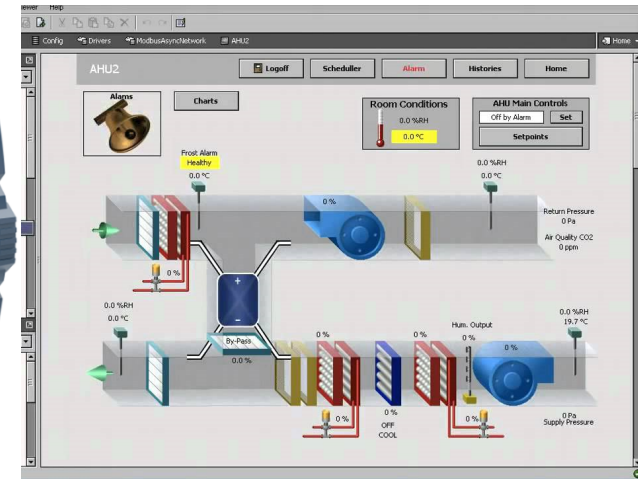
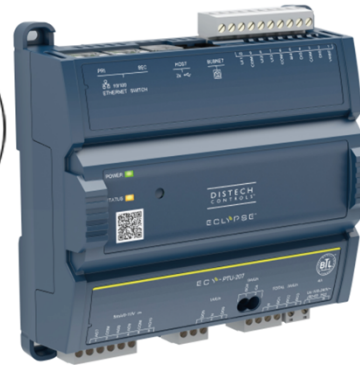


RECOMMENDED PHASE 1 SCOPE OF WORK

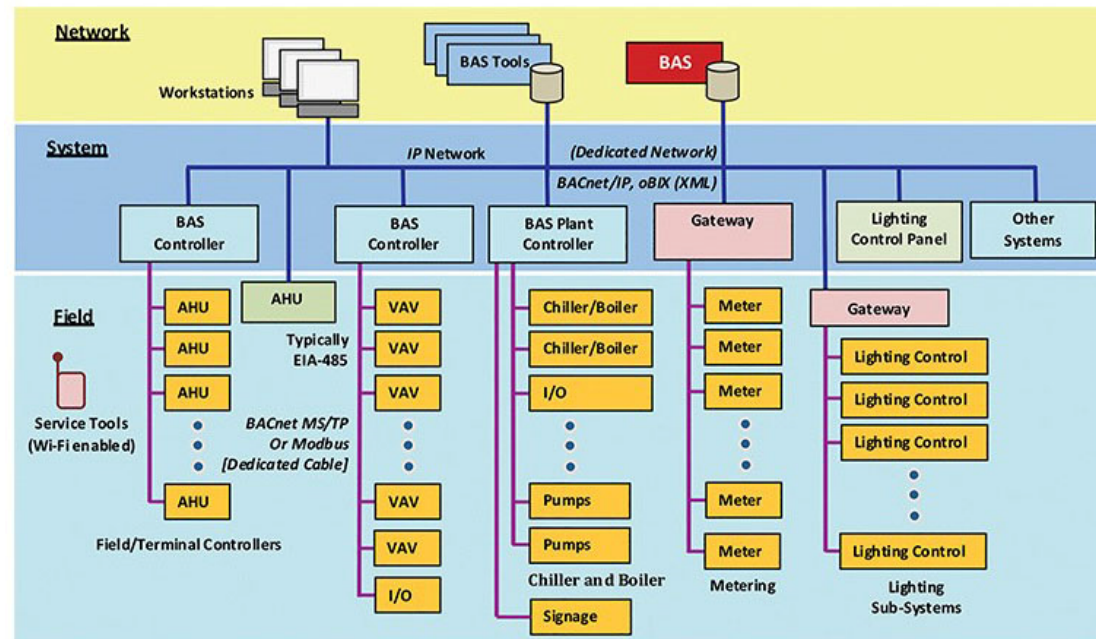
- Campus Wide - Building Management System upgrade
- Campus Wide - Boiler Blend Controls
- High School – Upgrade AHU's to DOAS Units, with AC capabilities, within 1988 renovated spaces.
- Middle School – Replace Office Unit.
- Middle School – Replace Cafeteria Unit, which would add AC to Cafeteria area.
- Middle School – Replace existing Boilers.
- Elementary School – Replace all Unit Ventilators within 1978 portion of school.
- Elementary School – Replace existing Cafeteria Heating/Ventilation Unit.



HVAC CONTROLS



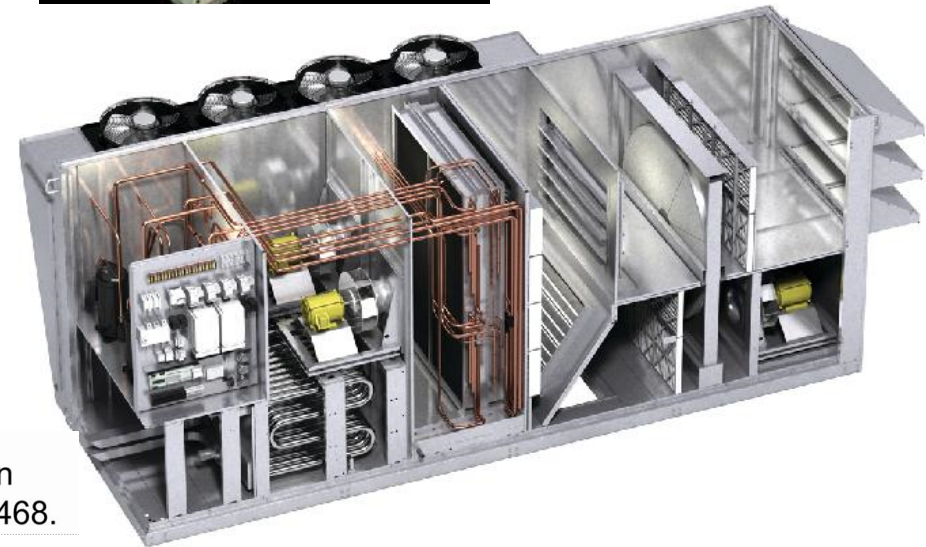
- Replace the existing pneumatic HVAC control systems (1970's Technology) campus-wide with modern electric/computer controls.
- No parts available to repair existing, younger staff lack training to operate/maintain portions that actually work.
- Failure of system during winter months would prevent heating spaces, force school closure, and potentially freeze piping, and possible piping failure.
- Savings: 5% to 15% of annual energy bills when fully operational.



DEDICATED OUTDOOR AIR SYSTEMS (DOAS)



- Replace existing HVAC equipment beyond its useful life with DOAS that can condition from 0 to 100% OA to ventilate spaces.
- Additional OA increases student learning capability & test scores by 5 to 15%¹
- Savings: 0% to 5% of annual energy used by existing AHUs.



¹Shaughnessy, R.J., et al. 2006. A preliminary study on the association between ventilation rates in classrooms and student performance. *Indoor Air* 16(6): 465-468.

REPLACE BOILER SYSTEMS

- District Facilities Manager has been replacing and upgrading the 7 boiler systems on this campus.
- During development of the HVAC assessment, a section of a Middle School boiler failed. Replacement parts are in short supply with long lead times. This boiler would be replaced as part of this project, in lieu of as an Emergency replacement.
- Future boiler sizing will use an OA temperature significantly lower than 7 degrees F, possibly -10 degrees F, to provide necessary code-required heating at the coldest temperatures.



WHY NOW?



- Better systems/controls improves health and well-being of students, staff and visitors, and is the first line of defense against airborne illness.
- Age/Condition of equipment is vulnerable to sudden failure, with resulting emergency needs dictating time and cost of replacement. Planned replacement is more cost and time effective than emergency replacement.
- Construction Cost Savings – Executing a Phase I scope of work as a single planned project reduces the Contractors' overhead costs (e.g., mobilization/demobilization, dumpster & crane rentals) and therefore Thompson's costs.
- Operational Cost Savings – Older equipment (especially from 1978) is less energy efficient and less capable than new equipment.
- The Opportunity for State Grant Funds is open to us **now**, which reduces financial impacts to local community.



DELAYING IMPLEMENTATION DISADVANTAGES



- Existing systems do not meet current codes. Building codes exist to help people avoid issues others have made. Delaying upgrades also delays the benefits that current codes provide to end users.
- Future government intervention, including additional codes and regulations, will require systems that cost more to meet the tougher requirements at time of installation later.
- Indoor Environmental Quality (IEQ), such as space OA ventilation, or HVAC equipment noise, has a significant impact on a student's ability to learn. Delays improving IEQ can negatively impact students, teachers, and building occupants.
- HVAC upgrades will better prepare the District for future infectious outbreaks.



BUDGET & FINANCIAL PICTURE



- Overall Project Budget / Estimate is \$13.2 Million
 - Estimate completed by H.F. Lenz and reviewed by the Building Committee
 - Appropriate Construction and Estimating Contingencies applied
 - Given market conditions, appropriate Bid and Escalation Contingencies included as well.
 - In addition to the savings outlined within the previous slides regarding mechanical efficiency and technology advancements, additional operational costs savings will be realized as well (Oil, Electrical, Labor, to name a few).
 - The State has offered a reimbursement of 68.2 %, while leaving 31.8% to the taxpayers. Your paid Taxes being brought back to our Town!
- Mill Rate Impact (Conservative Estimate):
 - 2025: .70
 - 2026: .57 (Reduction = Bond Adjustments from Grant)
 - 2027: .50
 - ❖ Example: Home Value = \$225,000, assessed at 70% or \$157,500 at .50 Mill Rate = \$78.75 Per Year

- ✓ ***Ignoring end of life mechanical systems does not make them go away.***
- ✓ ***In the future these mechanical items will cost more and/or possibly have a significant impact on the day-to-day operations of the School should they randomly fail.***
- ✓ ***Should the Town NOT receive the Grant, the Project is NOT moving forward.***

THANK YOU

