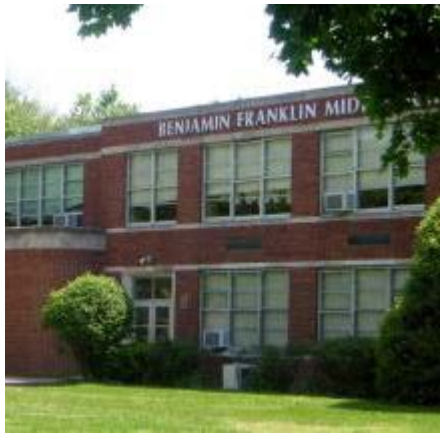
RPS HV & HVAC Projects



Ridgewood Public Schools

ESIP Projects and Future HV and HVAC Capital Improvement Projects

Energy Savings Improvement Program (ESIP)

Through ESIP the schools listed on this slide had one of their two boilers or burners replaced. RHS had two boilers replaced. The remaining boilers are over the useful life and will need replacement in the future. Schools have two boilers for redundancy, efficiency and for extreme cold weather.

- Hawes (1 Boiler - $211,578)
- Orchard (1 Boiler - $227,581)
- Somerville (1 Boiler – $308,715)
- Travell (1Boiler - $231,875)
- Willard (Burner $57,000)
- BFMS (1 Boiler - $318,750)
- GWMS (1 Boiler - $279,815)
- Ridgewood High School (2 Boilers - $697,000)

Glen and Ridge
Built in 1959

Glen and Ridge have identical forced hot air heating systems which are obsolete.

Hot Air Plenum Design with Furnaces that need replacement. Plenum are ductless systems in which air flows (heat and non-heated air) is transferred above the interior ceiling and below the exterior roof structure.

These furnaces were not replaced as part of the ESIP projects, because an entire system replacement is necessary.

Hot Air Plenum heating design was state of the art in 1959, but was not a popular heating system for schools. Now the system is obsolete, difficult to repair as replacement parts are not available.

+ Recommendation

Convert the Hot Air Plenum System to Hot Water Heat at Glen and Ridge

Glen and Ridge
Convert Hot Air to Hot Water Heat

- Requires:
  - Two Hot Water Boilers for each building. (Redundancy, Efficiency and Extreme Weather)
  - Hot Water pipes and duct work installed throughout original building, replacing plenum system
  - New controls (DDC)
  - New HVAC units on roof top and in multipurpose room, main office areas and HV roof top units for other spaces (i.e. classrooms etc.)

Buildings with Hot Water Heat

- Hawes built in1965 with additions added in 1974, 2004, and 2010. Remaining boiler is 45 years old. We replaced one boiler through the ESIP.
- Orchard built in 1965 with one addition added in 2004. Remaining boiler is 31 years old. We replaced one boiler through the ESIP.
- Travell built in 1965 with addition added in 2004. Remaining boiler is 30 years old. We replaced one boiler through the ESIP.

Update Hot Water Heat Systems at Hawes, Orchard, and Travell

Requires:

- Replacement of second redundant boilers in these buildings not covered in ESIP. Schools generally have two boilers for redundancy, efficiency and for extreme cold weather.
- New controls (DDC)
- Refurbish all classroom unit ventilators (Uni-vents are original to the buildings)
- Replacement of HV roof top units in some areas (gyms, multipurpose rooms, and offices)

Buildings with Steam Heat

- Somerville built in 1951 with additions in 1957,1964, and 2004. 2nd boiler is 39 years old. We replaced one boiler through the ESIP.
- Willard built in 1926 with additions in 1952, 2000, and 2011 (Inside castings replaced 25 years ago.)
- BFMS built in 1949 with additions in 1952. 2nd boiler is 39 years old. We replaced one boiler through the ESIP.
- GWMS built in 1928 with addition in 2010. 2nd boiler is 39 years old. We replaced one boiler through the ESIP.
- NOTE: Boilers (ages listed above) and uni-vents are original to the buildings and have been maintained past their useful life. Obsolete technology with pneumatics is in the walls.

Steam Heat should be converted to Hot Water Heat

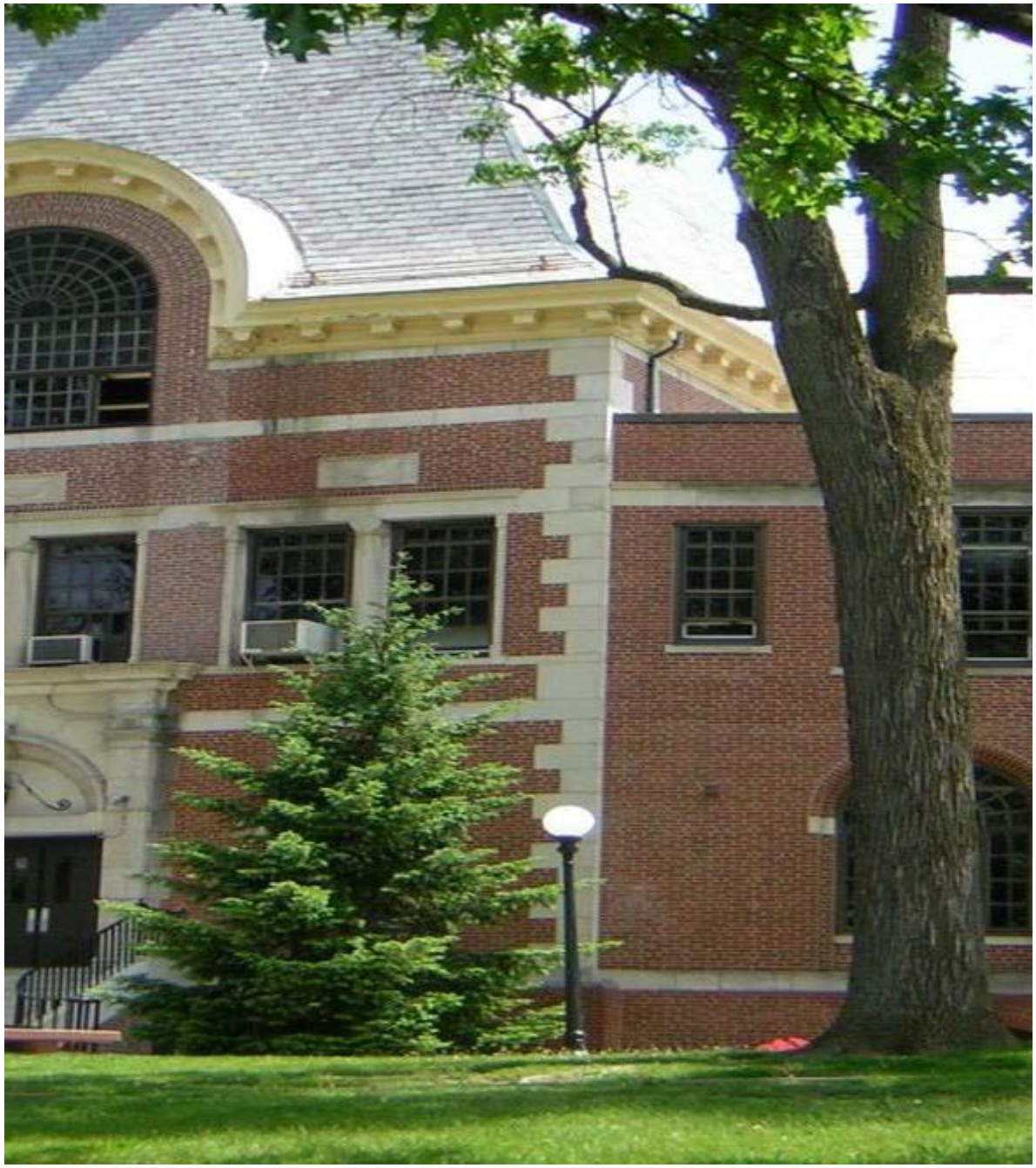
- The steam heat and steam pipes are original to these buildings and are between 66 and 90 years old.
- The number of needed repairs to steam pipes increases each year. Last year the district made 40 repairs to steam pipes that were leaking.
- Steam pipes are buried under floors and inside walls making repairs difficult, time consuming, and costly.
- Heat distribution throughout these buildings is uneven causing staff and students discomfort as rooms are either too cold or too hot, neither situation being conducive to quality learning environments.

Conversion to Hot Water Heat

- Requires new heating pipes to be installed allowing access for repairs in new chases built in hallway ceilings and along walls.
- Improved control of heat distribution eliminating the uneven flow of heat to classrooms.
- New boilers replaced under ESIP will be converted from steam to hot water at a cost of $30,000 each. (This was planned.)
- Improved energy conservation, further lowering energy costs.

Steam to Hot Water Conversion would require

- Convert new steam boilers (ESIP) to hot water boilers
- Replace old boilers with new hot water boilers
- Remove steam/condensate piping and install new hot water piping
- Replace Classroom unit ventilators (original to steam system)
- Install new temperature control system (DDC)



RHS

Heating Upgrades

Requires replacement of HVAC units, 1999 wing

Replacement of room HV and HVAC units (locker rooms, learning commons, TV studio, cafeteria)

What are the costs for replacing heating systems at Glen and Ridge

- Glen:
  - Remove obsolete furnace (forced hot air system); Install hot water boilers; Install new Roof Top HVAC units/New ductwork/and ductless HVAC Systems; Install new DDC temp controls for and estimated $4,100,000 (including soft costs).
- Ridge:
  - Remove obsolete furnace (forced hot air system); Install hot water boilers; Install new Roof Top HVAC units/New ductwork/and ductless HVAC Systems; Install new DDC temp controls for an estimated $5,100,000 (including soft costs).

The costs for upgrading systems at Hawes,Orchard and Travell

- Hawes: Replace remaining old hot water boiler; refurbish existing classroom unit ventilators; replace old rooftop HVAC units; replace multipurpose room HV Units; upgrade HVAC system for Main Office/Principal/Nurse Area; Install new DDC temp controls, replace exhaust fans. For an estimated cost of $2,000,000 (incl. soft costs)

- Orchard: Replace remaining old hot water boiler; refurbish existing classroom unit ventilators; replace old rooftop HVAC units; replace multipurpose room HV Units; upgrade HVAC system for Main Office/Principal/Nurse Area; Install new DDC temp controls, replace exhaust fans. For an estimated cost of $1,500,000 (incl. soft costs)

- Travell: Replace remaining old hot water boiler; refurbish existing classroom unit ventilators; replace old rooftop HVAC units; replace multipurpose room HV Units; upgrade HVAC system for Main Office/Principal/Nurse Area; Install new DDC temp controls, replace exhaust fans. For an estimated cost of $1,800,000 (incl. soft costs)

The cost for converting heating system at BF, GW, Somerville and Willard

Work at these schools will include: Convert boilers to hot water and replace old boilers; replace existing classroom unit ventilators; replace old HV/HVAC units; replace steam pipes with hot water pipes; Upgrade HVAC in offices and nurse; install new DDC controls; replace exhaust fans

- BFMS estimated cost $10,700,000 including soft costs
- GWMS estimated cost $7,800,000 including soft costs
- Somerville -estimated cost $5,200,000 including soft costs
- Willard -estimated cost $4,400,000 including soft costs

Cost for upgrades to heating system at RHS

- RHS: Replace old roof top units HVAC on 1999 wing; replace old HV/HVAC units; replace exhaust fans. Estimated cost $1,900,000 including soft costs.

Total costs

- $44,500,000 to completely upgrade HV and HVAC in the Ridgewood Public School District. The working life of these systems are 20 to 35 years. Our systems have worked at least twice that time due to constant and continued maintenance and repair.