

EXHIBIT B
Scope of Services

Trane shall perform The Services, designated as “ECMs” as set forth in this Exhibit B. In general, such ECMs are applied to existing systems and subsystems in Customer’s premises with the intent of delivering working systems as described more particularly below. In the event that Trane encounters malfunctioning or defective components in Customer’s existing systems or subsystems and repair or replacement of such components was not contemplated in Trane’s Scope of Services as set forth below, Trane shall document such defective or malfunctioning components together with options and alternatives to repair or replace such components and submit to Customer as soon as practical so as to enable Customer to make an informed decision with regard to repair, replacement or abandonment of such components.

Trane will disconnect piping from existing devices such as air handling units, unit ventilators, boilers, etc. and reconnect existing piping systems to new devices. Existing valves and fittings will be reused where conditions allow, repaired or replaced if needed to create proper operation. Major replacements of piping mains or branch piping runs are not included.

Furnace Brook Middle School:

ECM FB-1: New Variable Frequency Drives for HW pumps

Variable Frequency Drives (VFDs) enable previously constant speed motors to vary speed to match conditions, thus optimizing energy usage. The VFDs are installed between to motor and electrical source. The below VFDs will enable variable speed of heating hot water pumps by sensing temperature and adjusting speed accordingly.

- Following motors are identified for the variable frequency drive installation

	HP
Hot Water Pump P1	30
Hot Water Pump P2	30

- The VFDs shall be Trane TR200, or approved equal.
- The VFDs shall be either floor or wall mounted and located as close as possible to the associated pumps. Mounting locations, including necessary clearances, shall meet the requirements of the NEC, latest edition.
- The VFDs shall be equipped with an Auto bypass function which will allow the motor to be run should a fault condition prevent proper operation by the VFD.
- Each VFD shall have a lockable cabinet.
- Each VFD shall have the ability to require a password to make changes to programming or set points.
- Each VFD shall be continuously variable, and not of the step type.
- The VFD total harmonic distortion rating (taking into account the effect of the isolation transformer) shall not exceed 3%, unless specifically pre-approved in writing.



- The VFDs shall be properly grounded through a ground connector connected to a ground terminal.
- Furnish and install necessary control devices such as differential pressure or temperature sensors in order to control the speed of the VFDs.
- Each VFD shall be programmed, properly started up, commissioned and tested in accordance with manufacturer instructions.

ECM FB-2: Building Envelope improvement:

Building envelope improvement consists of the installation of weather stripping and like materials designed to mitigate or eliminate infiltration around existing doors.

- Weather-strip seven (7) double exterior doors. (ground floor)
- Weather-strip five (5) single exterior doors. (ground floor)
- Weather-strip eighteen (18) exterior doors. (bottoms only)
- Weather-strip one (1) single interior boiler room door.



Martinson Elementary School:

ECM M-1: New Steam Boiler Plant

The new Steam Boiler Plant consists of the demolition and disposal of the existing plant equipment and the installation of new, properly sized, efficient plant equipment as described below. Pursuant to Article 5, Section 5.01 of this Agreement, customer shall properly remove and dispose of any hazardous materials as disclosed on Exhibit F of this Agreement, including the Asbestos material present in the Martinson Boiler Plant prior to Trane's commencement of work as described below.

Boiler Plant Demolition

- Demolish the existing boilers and all the associated piping.
- Disconnect electrical and remove conduit and wire back to source.
- Reserve circuit breakers for reuse with new plant equipment
- Removal and disposal of material shall be in accordance with local, state and federal regulations.

Boiler Plant New Work

- Furnish and install new housekeeping pads or extend existing for the new boilers where required.
- Install two HB Smith series 28HE-S-10 steam boilers, or approved equal, rated for gross output of 2,513 MBH.
- Modify existing combustion air duct work by installing a motorized damper with an electric actuator, interlocked with the boiler burner ignition including an override for manual operation.
- Furnish and install steam stop valves at the boiler steam outlet header. One automatic non-return valve and a second valve of the outside screw and yoke type.
- Furnish and install new breeching and back draft damper from the new boilers to the existing breeching and stack.
- Furnish and install new steam, feed water, condensate, blow down, vents and make-up water piping and valves as required to connect to new boilers and existing feed water systems including hangers and supports.
- Furnish and install new gas piping, vents and valves as required to connect to new boilers including hangers and supports.
- Furnish and install duplex boiler feed water system.
- Furnish and install new steam pressure and temperature gauges at the boiler steam outlet header.
- Furnish and install 2-3/4" valves with caps on the condensate return line for chemical introduction.
- Complete electrical line voltage tie-ins for new boilers, combustion air dampers, etc.
- Insulate all new steam, condensate piping and new sections of breeching.
- Start-up new boilers and associated equipment.
- All new work and equipment shall comply with all federal, state and local codes and regulations and with the latest edition of applicable standards, codes and specifications.
- Prepare paper work for all required boiler permits and submit to local building inspector.



Boiler Plant Commissioning

- Commissioning shall be performed to verify that the boiler plant equipment and systems perform interactively according to the design intent and the owner's operational needs.
- Document proper performance of new equipment and systems. Trane to ensure that the O&M and commissioning documentation left on site is completed and that the owner's operating and maintenance personnel are adequately trained.

ECM M-2: Air Cooled Condenser for Walk in Refrigerator

Replacement of the existing domestic-water cooled condenser, which currently serves the walk-in refrigerator, with a modern, air-cooled condenser eliminates significant water usage and discharge to sewer.

- Demolish existing water cooled condenser for walk in refrigerator.
- Furnish and install new, Copeland, Krack or equivalent air cooled condensing unit for walk in cooler refrigerator.
- Reclaim and recharge refrigerant in the system.
- Start up of new air cooled condenser.



South River Elementary School:

ECM SRE-1: New Steam Boilers:

The new Steam Boiler Plant consists of the demolition and disposal of the existing plant equipment and the installation of new, properly sized, efficient plant equipment as described below. Pursuant to Article 5, Section 5.01 of this Agreement, customer shall properly remove and dispose of any hazardous materials as disclosed on Exhibit F of this Agreement, including the Asbestos material present in the South River Elementary School Boiler Plant prior to Trane's commencement of work as described below.

Boiler Plant Demolition

- Demolish three (3) of the existing boilers and all the associated piping.
- Disconnect electrical and remove conduit and wire back to source.
- Reserve circuit breakers for new work.
- Removal and disposal of material shall be in accordance with local, state and federal regulations.

Boiler Plant New Work

- Furnish and install new housekeeping pads or extend existing for the new boilers where required.
- Install two (2) HB Smith series 28HE-S-7, or equal, steam boilers rated for gross output of 1,722 MBH in place of three (3) previously removed boilers.
- Modify existing combustion air ductwork by installing a motorized damper with an electric actuator interlocked with the boilers burner ignitions including an override for manual operation.
- Furnish and install steam stop valves at the boiler steam outlet header. One automatic non-return valve and a second valve of the outside screw and yoke type.
- Furnish and install new breeching and back draft damper from the new boiler to existing breeching.
- Furnish and install new steam, feed water, condensate, blowdown, vents and make-up water piping and valves as required to connect to new boiler and existing feed water system including hangers and supports.
- Furnish and install new gas piping, vents and valves as required to connect to new boiler including hangers and supports.
- Furnish and install duplex boiler feed water system.
- Furnish and install new steam pressure and temperature gauges at the boiler steam outlet header.
- Furnish and install 2-3/4" valves with caps on the condensate return line to introduce chemical.
- Complete electrical line voltage tie-ins for new boilers, combustion air dampers, etc.
- Insulate all new steam, condensate piping and new breeching..
- Connect controls for boilers to new Energy Management System (EMS).
- Start-up of new boiler and associated equipment.



- The new work and equipment shall comply with all federal, state and local codes and regulations and with the latest edition of applicable standards, codes and specifications.
- Prepare paper work for all required boiler permits and submit to local building inspector.

Boiler Plant Commissioning

- Commissioning shall be performed to verify that the boiler plant equipment and systems perform interactively according to the design intent and the owner's operational needs.
- Document proper performance of new equipment and systems. Trane to ensure that the O&M and commissioning documentation left on site is completed and that the owner's operating and maintenance personnel are adequately trained.

ECM SRE-2: New Unit Ventilators

New Unit Ventilators provide reliable, well controlled and efficient heating and ventilation. The new Unit Ventilators will be installed in the spaces formerly occupied by the existing unit ventilators. The existing pneumatic controls and room thermostats will be removed and replaced with modern direct digital control. In addition the unit ventilators will be connected to the new Energy Management System for centralized control and monitoring.

Demolition of Existing Unit Ventilators (27):

- Drain the water from the heating system prior to demolition.
- Disconnect all the electrical connection for the unit ventilators in the class rooms.
- Disconnect the steam and condensate piping for the unit ventilators.
- Disconnect all the pneumatic controls and piping for the unit ventilators.
- Disconnect and remove any pneumatic thermostats from the class rooms. Pneumatic tubing within walls and concealed spaces shall be abandoned in place.
- Remove and demolish the existing unit ventilators.
- The following are the number of unit ventilators that need to be demolished.

South River Elementary: 27 Units

Installation of New Unit Ventilators (27):

- Install new Trane unit ventilators.
- Connect the steam and condensate piping to new unit ventilators.
- Furnish and provide electrical connection to new unit ventilators.
- Install new temperature sensor provided with new unit ventilators on the wall at appropriate location.
- Refinish the area to match existing if necessary.
- Clean the area after installation.
- Connect the factory mounted control on the unit ventilators to the energy management system.
- Start up and commission new unit ventilators.



ECM SRE-3: New Air Handler for Gym, Café, Arts room and Computer room:

New air handling equipment provides reliable, well controlled and efficient heating and ventilation. The new air handlers will be installed in place of the existing equipment. Existing pneumatic control equipment will be removed and replaced with modern direct digital control. In addition the new units will have factory mounted direct digital controls and will be connected to the new Energy Management System for centralized control and monitoring

Demolition of Existing Air Handling Equipment:

- Drain the water from the heating system prior to demolition.
- Disconnect all the electrical connection for the air handling unit in the class rooms.
- Disconnect the steam and condensate piping from units.
- Disconnect all the pneumatic controls and piping from the units
- Disconnect and remove any pneumatic thermostats from the space. Pneumatic tubing within walls and concealed spaces shall be abandoned in place.
- Remove and demolish the existing AHUs.

Installation:

- Install new AHUs furnished by Trane.
- Connect the existing piping to new units.
- Furnish and provide electrical connection to new units.
- Install new temperature sensor provided with new units on the wall at appropriate location.
- Refinish the area to match existing if necessary.
- Clean the area after installation.
- Connect the factory mounted control on the air handling units to the energy management system.
- Start up and commissioning of the new unit AHUs.

ECM SRE-4: New Energy Management System:

A New Trane Tracer Energy Management System (EMS) consisting of the below general components will be installed to enable direct digital control and monitoring of HVAC equipment.

- Install one (1) Trane web-based "System Controller" (SC); provide graphics (floor plans and equipment flow diagrams), equipment operating schedules, setup alarm parameters, etc.; incorporate equipment and new controllers listed below into new automation system.
- Install one (1) Trane programmable controller (MP581) in boiler plant; provide power wiring (120VAC) for same; incorporate MP581 into building automation system network.
- Install necessary sensors (wells, temperature sensors, pressure transmitters, etc.) as well as end devices (valves, relays, actuators, etc.) to achieve required control sequences for the boiler plant and associated equipment.



- Install network wiring (Trane "Comm5") for twenty-seven (27) new unit ventilators; plenum rated cabling to be used in concealed locations, EMT for exposed areas and in mechanical rooms (applies to all installed network wiring).
- Program, startup, test, and commission new unit ventilator controllers (factory-installed Trane ZN520); incorporate into network and provide graphics for each unit.
- Install multipurpose programmable controllers (Trane MP580 – factory installed) to start/stop and control new air handling units (4); install any necessary field devices including relays, current sensing switches, temperature sensors, etc., for same; program, startup, test, and commission new controllers; incorporate into network and provide graphics for each unit.
- Install multipurpose programmable controllers (Trane MP503) to start and stop exhaust fans; install necessary relays and current sensing switches for same; program, startup, test, and commission new controllers; incorporate into network and provide graphics for each unit.
- Complete "as built" drawings.

ECM SRE-5: Building Envelope improvement:

Building envelope improvement consists of the installation of weather stripping and like materials designed to mitigate or eliminate infiltration around existing doors.

- Weather-strip five (5) double exterior doors. (ground floor)
- Weather-strip eight (8) single exterior doors. (basement)
- Weather-strip one (1) single interior boiler room door



Eames Way Elementary School:

ECM EW-1: New Steam Boilers:

The new Steam Boiler Plant consists of the demolition and disposal of the existing plant equipment and the installation of new, properly sized, efficient plant equipment as described below. Pursuant to Article 5, Section 5.01 of this Agreement, customer shall properly remove and dispose of any hazardous materials as disclosed on Exhibit F of this Agreement, including the Asbestos material present in the Eames Way Boiler Plant prior to Trane's commencement of work as described below.

Boiler Plant Demolition

- Demolish the existing boilers and all the associated piping.
- Disconnect electrical and remove conduit and wire back to source.
- Reserve circuit breakers for reuse with new plant equipment
- Removal and disposal of material shall be in accordance with local, state and federal regulations.

Boiler Plant and Distribution System New Work

- Furnish and install new housekeeping pads or extend existing for the new boilers where required.
- Install two HB Smith series 28HE-S-4, or approved equal, steam boilers rated for gross output of 931 MBH.
- Modify existing combustion air duct work by installing a motorized damper with an electric actuator and interlock with the boiler burner ignition including an override for manual operation.
- Furnish and install steam stop valves at the boiler steam outlet header. One automatic non-return valve and a second valve of the outside screw and yoke type.
- Furnish and install new breeching and back draft damper from the new boiler to existing breeching and stack. Inspect existing back draft damper for existing boiler to remain in place as back-up. Replace if necessary.
- Furnish and install new steam, feed water, condensate, blowdown, vents and make-up water piping and valves as required to connect to new boiler and existing feed water system including hangers and supports.
- Furnish and install new gas piping, vents and valves as required to connect to new boiler including hangers and supports.
- Furnish and install duplex boiler feed water system.
- Furnish and install new steam pressure and temperature gauges at the boiler steam outlet header.
- Furnish and install 2-3/4" valves with caps on the condensate return line to introduce chemical.
- Complete electrical line voltage tie-ins for new boiler, combustion air damper, etc.
- Insulate all new steam, condensate piping and new breeching.
- Connect controls for boilers to new Energy Management System (EMS).
- Start-up of new boiler and associated equipment.



Boiler Plant Commissioning

- Commissioning shall be performed to verify that the boiler plant equipment and systems perform interactively according to the design intent and the owner's operational needs.
- Document proper performance of new equipment and systems. Trane to ensure that the O&M and commissioning documentation left on site is completed and that the owner's operating and maintenance personnel are adequately trained.

ECM EW-2: New Unit Ventilators

New Unit Ventilators provide reliable, well controlled and efficient heating and ventilation. The new Unit Ventilators will be installed in the spaces formerly occupied by the existing unit ventilators. The existing pneumatic controls and room thermostats will be removed and replaced with modern direct digital control. In addition the unit ventilators will be connected to the new Energy Management System for centralized control and monitoring.

Demolition of Existing Unit Ventilators (22):

- Drain the water from the heating system prior to demolition.
- Disconnect all the electrical connection for the unit ventilators in the class rooms.
- Disconnect the steam and condensate piping for the unit ventilators.
- Disconnect all the pneumatic controls and piping for the unit ventilators.
- Disconnect and remove any pneumatic thermostats from the class rooms. Pneumatic tubing within walls and concealed spaces shall be abandoned in place.
- Remove and demolish the existing unit ventilators.
- The following are the number of unit ventilators that need to be demolished.

Eames Way Elementary: 22 Units

Installation of New Unit Ventilators (22):

- Install new Trane unit ventilators.
- Connect the steam and condensate piping to new unit ventilators.
- Furnish and provide electrical connection to new unit ventilators.
- Install new temperature sensor provided with new unit ventilators on the wall at appropriate location.
- Refinish the area to match existing if necessary.
- Clean the area after installation.
- Connect the factory mounted control on the unit ventilators to the energy management system.
- Start up and commissioning of the new unit ventilators.

ECM EW-3 New Air Handler for Café and Kitchen:

New air handling equipment provides reliable, well controlled and efficient heating and ventilation. The new air handlers will be installed in place of the existing equipment. Existing pneumatic control equipment will be removed and replaced with modern direct digital control. In addition the new units will have factory mounted direct digital controls and will be connected to the new Energy Management System for centralized control and monitoring



Demolition of existing Air Handlers:

- Drain the water from the heating system prior to demolition.
- Disconnect all the electrical connection for the air handling unit in the class rooms.
- Disconnect the steam and condensate piping for the AHUs.
- Disconnect all the pneumatic controls and piping for the AHUs. Pneumatic tubing within walls and concealed spaces shall be abandoned in place.
- Disconnect and remove any pneumatic thermostats.

Installation of New Air Handlers:

- Install new Trane AHUs.
- Connect the steam and condensate piping to AHUs.
- Furnish and provide electrical connection to new AHUs.
- Connect the existing duct work to new AHUs
- Install new temperature sensor provided with new AHUs on the wall at appropriate location.
- Refinish the area to match existing if necessary.
- Clean the area after installation.
- Connect the factory mounted control on the air handling units to the energy management system.
- Start up and commissioning of the new AHUs.

ECM EW-4 New Energy Management System

A New Trane Tracer Energy Management System (EMS) consisting of the below general components will be installed to enable direct digital control and monitoring of HVAC equipment.

- Install one (1) Trane web-based "System Controller" (SC); provide graphics (floor plans and equipment flow diagrams), equipment operating schedules, setup alarm parameters, etc.; incorporate equipment and new controllers listed below into new automation system.
- Install one (1) Trane programmable controller (MP581) in boiler plant; provide power wiring (120VAC) for same; incorporate MP581 into building automation system network.
- Install necessary sensors (wells, temperature sensors, pressure transmitters, etc.) as well as end devices (valves, relays, actuators, etc.) to achieve required control sequences for the boiler plant and associated equipment.
- Install network wiring (Trane "Comm5") for twenty-two (22) new unit ventilators; plenum rated cabling to be used in concealed locations, EMT for exposed areas and in mechanical rooms (applies to all installed network wiring).
- Program, startup, test, and commission new unit ventilator controllers (factory-installed Trane ZN520); incorporate into network and provide graphics for each unit.
- Install multipurpose programmable controllers (Trane MP580 – factory installed) to start/stop and control new air handling units (2); install necessary relays, current sensing switches, or other required field-installed devices for same; program, startup, test, and commission new controllers; incorporate into network and provide graphics for each unit.



- Install multipurpose programmable controllers (Trane MP503) to start and stop exhaust fans; install necessary relays and current sensing switches for same; program, startup, test, and commission new controllers; incorporate into network and provide graphics for each unit.
- Complete "as built" drawings.

ECM EW-5: New Windows

New fiberglass window units will be installed in place of the existing units to reduce or eliminate infiltration and to improve the heat loss through improved U-values and thermal emissivity coefficients. All work will be performed so as not to interfere with classroom activities and in a manner that protects the building from the elements.

- The existing window units – approximately 4,391 square feet - and glazing shall be removed and properly disposed of by Trane.
- The existing wood trim shall be carefully removed and retained for reuse.
- The window opening shall be properly cleaned and made ready for installation of the new window units.
- Furnish and install approximately 4,391 square feet of new Inline Fiberglass Windows, or equivalent, in prepared masonry opening. The new window shall have the following characteristics:
 - 3mm Annealed (clear on Low-E/soft coat) IG, Argon, Warm edge spacer
 - Soft coat > Cardinal 272 or Cardinal 366
 - Safety tampered glass where required by law
 - Obscure glass to be installed to match existing windows.
 - The window will meet U –value rating of 0.30.
- The installation includes the following general details:
 - Remove existing windows and install in a clean window opening
 - Install all necessary blocking to receive new windows
 - Windows to be installed in a square and level manner
 - Fiberglass insulation at head sill and jambs
 - Reinstall existing interior wood trim
 - Exterior perimeter sealant applied, one part silicone sealant.
 - Exterior lift to be used where required



Daniel Webster School:

ECM DW-1: New Boiler Plant

The new Boiler Plant consists of the demolition and disposal of the existing plant equipment – including the steam boilers and steam to hot water heat exchanger and the installation of new highly-efficient natural gas condensing boilers as described below. Pursuant to Article 5, Section 5.01 of this Agreement, customer shall properly remove and dispose of any hazardous materials as disclosed on Exhibit F of this Agreement, including the Asbestos material, if present, in the Daniel Webster Boiler Plant prior to Trane's commencement of work as described below

Boiler Plant Demolition

- Demolish the existing (2) steam boilers, heat exchanger, original DHW storage tank, pumps and all the associated piping.
- Disconnect electrical and remove conduit and wire back to source.
- Reserve circuit breakers for new work.
- Removal and disposal of material shall be in accordance with local, state and federal regulations.

New Work:

- Install six (6) wall mounted Viessmann Vitoden 200 WB2B870, or approved equal, condensing boilers rated at input capacity of 370 MBH each.
- Furnish and install new gas piping for new boilers.
- Furnish and install new hot water piping to connect the new boilers to existing HW distribution system and new AHU located in the ceiling of boiler room.
- Furnish and install new hot water circulation pumps to distribute the hot water through new unit ventilators and existing base board radiators in the space.
- Furnish and install new temperature and pressure gauges for supply and return piping to boiler, temperature range (0-250 °F) and pressure range (0-30 psig).
- Furnish and install a new strainer on the return line to the boiler.
- All new piping shall be labeled and all new valves shall be tagged.
- All ball valves that require insulation shall be furnished with handle extensions.
- Complete electrical tie-ins for new boilers, motorized damper, and new hot water pumps etc.
- Furnish and install new venting system for new boilers.
- Furnish and install new neutralizing tank and associated piping for the boilers.
- Hydro test or pressure test new piping and clean and flush new equipment.
- Start-up of the new boiler and associated equipment.
- The new work and equipment shall comply with all federal, state and local codes and regulations and with the latest edition of applicable standards, codes and specifications.
- Prepare paper work for all required boiler permits and submit to local building inspector and Trane.



Boiler Plant Commissioning

- Commissioning shall be performed to verify that the boiler plant equipment and systems perform interactively according to the design intent and the owner's operational needs.
- Document proper performance of new equipment and systems. Trane to ensure that the O&M and commissioning documentation left on site is completed and that the owner's operating and maintenance personnel are adequately trained.

ECM DW-2: New Unit Ventilators

New Unit Ventilators provide reliable, well controlled and efficient heating and ventilation. The new Unit Ventilators will be installed in the spaces formerly occupied by the existing unit ventilators. The existing pneumatic controls and room thermostats will be removed and replaced with modern direct digital control. In addition the unit ventilators will be connected to the new Energy Management System for centralized control and monitoring.

Demolition of Existing Unit Ventilators (28):

- Drain the water from the heating system prior to demolition.
- Disconnect all the electrical connection for the unit ventilators in the class rooms.
- Disconnect the hot water piping for the unit ventilators.
- Disconnect all the pneumatic controls and piping for the unit ventilators.
- Disconnect and remove any pneumatic thermostats from the class rooms. Pneumatic tubing within walls and concealed spaces shall be abandoned in place.
- Remove and demolish the existing unit ventilators.
- The following are the number of unit ventilators that need to be demolished.

Installation of New Unit Ventilators (28):

- Install new Trane unit ventilators.
- Connect the hot water piping to new unit ventilators.
- Furnish and provide electrical connection to new unit ventilators.
- Install new temperature sensor provided with new unit ventilators on the wall at appropriate location.
- Refinish the area to match existing if necessary.
- Clean the area after installation.
- Connect the factory mounted control on the unit ventilators to the energy management system.
- Start up and commissioning of the new unit ventilators.

ECM DW-3: New Air Handler for Café, Primary Activity Room and Gym:

New air handling equipment provides reliable, well controlled and efficient heating and ventilation. The new air handlers will be installed in place of the existing equipment. Existing pneumatic control equipment will be removed and replaced with modern direct digital control. In addition the new units will have factory mounted direct digital controls and will be connected to the new Energy Management System for centralized control and monitoring



Demolition of Existing Air Handlers:

- Drain the water from the heating system prior to demolition.
- Disconnect all the electrical connection for the air handling units.
- Disconnect the supply and return piping for the AHUs.
- Disconnect all the pneumatic controls and piping for the AHUs.
- Disconnect and remove any pneumatic thermostats.

Installation of New Air Handlers:

- Install new AHUs furnished by Trane.
- Connect the hot water piping to AHUs.
- Furnish and provide electrical connection to new AHUs.
- Connect the existing duct work to new AHUs
- Install new temperature sensor provided with new AHUs on the wall at appropriate location.
- Refinish the area to match existing if necessary.
- Clean the area after installation.
- Connect the factory mounted control on the unit ventilators to the energy management system.
- Start up and commissioning of the new AHUs.

ECM DW-4 New Energy Management System

A New Trane Tracer Energy Management System (EMS) consisting of the below general components will be installed to enable direct digital control and monitoring of HVAC equipment.

- Install one (1) Trane web-based "System Controller" (SC); provide graphics (floor plans and equipment flow diagrams), equipment operating schedules, setup alarm parameters, etc.; incorporate equipment and new controllers listed below into new automation system.
- Install one (1) Trane programmable controller (MP581) in boiler plant; provide power wiring (120VAC) for same; incorporate MP581 into building automation system network.
- Install necessary sensors (wells, temperature sensors, pressure transmitters, etc.) as well as end devices (valves, relays, actuators, etc.) to achieve required control sequences for the boiler plant and associated equipment.
- Install network wiring (Trane "Comm5") for twenty-eight (28) new unit ventilators; plenum rated cabling to be used in concealed locations, EMT for exposed areas and in mechanical rooms (applies to all installed network wiring).
- Program, startup, test, and commission new unit ventilator controllers (factory-installed Trane ZN520); incorporate into network and provide graphics for each unit.
- Install multipurpose programmable controllers (Trane MP580 – factory installed) to start/stop and control new air handling units (3); install necessary relays, current sensing switches, or other required field devices for same; program, startup, test, and commission new controllers; incorporate into network and provide graphics for each unit.



- Install multipurpose programmable controllers (Trane MP503) to start and stop exhaust fans; install necessary relays and current sensing switches for same; program, startup, test, and commission new controllers; incorporate into network and provide graphics for each unit.
- Complete "as built" drawings.

ECM DW-5 New Windows

New fiberglass window units and new panels will be installed in place of the existing windows and panels to reduce or eliminate infiltration and to improve the heat loss through improved U-values and thermal emissivity coefficients. All work will be performed so as not to interfere with classroom activities and in a manner that protects the building from the elements.

- The existing window units and glazing shall be removed and properly disposed of by Trane.
- The existing wood trim shall be carefully removed and retained for reuse.
- The window opening shall be properly cleaned and made ready for installation of the new window units.
- Furnish and install new insulated panels for total of approximately 2,090 square feet of the bottom opening. The panels shall have the following general characteristics:
 - Panels to be standard color Kynar on a 0.032 smooth aluminum, the core to be polystyrene face and back stabilizer to be corrugated plastic, backsheet to be random aluminum.
 - 1.5" thickness of insulated panel with R-value of 6.7.
- Furnish and install approximately 6,815 square feet of new Inline Fiberglass Windows, or equivalent, in the remaining part of the opening. The new window shall have the following characteristics:
 - 3mm Annealed (clear on Low-E/soft coat) IG, Argon, Warm edge spacer
 - Soft coat - Cardinal 272 or Cardinal 366
 - Safety tampered glass where required by law
 - Obscure glass to be installed to match existing windows.
 - The window will meet U –value rating of 0.30.
- The installation includes the following general details:
 - Remove existing windows and install in a clean window opening
 - Install all necessary blocking to receive new windows
 - Windows to be installed in a square and level manner
 - Fiberglass insulation at head sill and jambs
 - Reinstall existing interior wood trim
 - Exterior perimeter sealant applied, one part of silicone sealant.
 - Exterior lift to be used where required

ECM DW-6 New Motors and Variable Frequency Drives for HW pumps

Variable Frequency Drives (VFDs) enable previously constant speed motors to vary speed to match conditions, thus optimizing energy usage. The VFDs are installed between to motor and electrical source. In this case, new premium efficiency motors will be installed as well. The below VFDs will



enable variable speed of heating hot water pumps by sensing temperature and adjusting speed accordingly.

Following motors are identified for the replacement and variable frequency drive installation

Daniel Webster School	
	HP
Hot Water Pump P1	7.5
Hot Water Pump P2	7.5

- The motors shall be Baldor, or approved equal, premium efficiency motors
- The VDS shall be Trane TR200, or approved equal.
- The VFDs will be either floor or wall mounted and located as close as possible to the associated pumps/fans. Mounting locations, including necessary clearances, shall meet the requirements of the NEC, latest edition.
- VFD shall be equipped with an Auto bypass function which will allow the motor to be run across the line should a fault condition prevent proper operation by the VFD.
- Each VFD shall have a lockable cabinet.
- Each VFD shall have the ability to require a password to make changes to programming or set points.
- Each VFD shall be continuously variable, and not of the step type.
- Total harmonic distortion (taking into account the effect of the isolation transformer) shall not exceed 3%, unless specifically pre-approved in writing.
- The drive must be grounded through a ground connector connected to the ground terminal.
- Provide programming, start up, and test of VFD
- Furnish and install necessary control devices such as differential pressure sensor in order to control the speed of new VFDs.
- Provide necessary programming to control new variable frequency drive.
- Perform the commissioning of new VFDs.

ECM DW-7 Air Cooled Condenser for Walk in Refrigerator

Replacement of the existing domestic-water cooled condensing unit, which currently serves the walk-in refrigerator, with a modern, air-cooled condenser eliminates significant water usage and discharge to sewer.

- Demolish existing water cooled condenser for walk in refrigerator.
- Furnish and install new Copeland, Krack, or equivalent air cooled condensing unit for walk in cooler refrigerator.
- Reclaim and recharge refrigerant in the system.
- Start up of new air cooled condenser.



Governor Winslow Elementary School:

ECM GW-1 Air Cooled Condenser for Walk in Refrigerator

Replacement of the existing domestic-water cooled condensing unit, which currently serves the walk-in refrigerator, with a modern, air-cooled condenser eliminates significant water usage and discharge to sewer.

- Demolish existing water cooled condenser for walk in refrigerator.
- Furnish and install new Copeland, Krack or equivalent, air cooled condensing unit for walk in cooler refrigerator.
- Reclaim and recharge refrigerant in the system.
- Start up of new air-cooled condensing unit.



Marshfield Town Hall:

ECM TH-1: Town Hall VAV Conversion:

The Marshfield Town Hall's HVAC system will be replaced with a modern Variable Air Volume (VAV) system, including such major components as air handling units, new ductwork with VAV distribution boxes, new boilers and controls as more particularly detailed below. Pursuant to Article 5, Section 5.01 of this Agreement, customer shall properly remove and dispose of any hazardous materials as disclosed on Exhibit F of this Agreement, including the Asbestos material, if present, in the Town Hall Boiler Plant prior to Trane's commencement of work as described below

Demolition of Existing Systems:

- Demolish existing AC1, AC2 and three make up air units located in the mechanical room.
- Demolish and remove existing boiler room from the mechanical room.
- Disconnect all the electrical connections for Air conditioning units, make up air unit and boiler.
- Disconnect and remove condensing unit on the roof.
- Demolish existing PTAC units from the space. Total of 37 units to be removed. Patch interior wall. Exterior louvers remain.
- Removal and disposal of material shall be in accordance with local, state and federal regulations. .

New Sheet Metal Work:

- Furnish and Install properly sized Trane central air handling unit in the mezzanine mechanical room.
- Furnish and install new remote condensing unit associated with new Trane air handling unit and connect all the refrigerant piping from new condensing unit to DX coil in the Trane unit.
- Modify the existing duct work in the ceiling for 1st and 2nd floor to accept increased flow from the new AHU.
- Furnish and install new duct work with VAV boxes to serve individual office area in the building. Total 43 VAV boxes to be installed.
- Furnish and install new HW piping for the VAV reheat coils.
- Air balancing of new duct work.
- Start up and commissioning of new system,

ECM: New Boiler Plant

- Install two wall mounted Viessmann Vitoden 200 WB2B870, or approved equal, condensing boilers rated at input capacity of 370 MBH each.
- Furnish and install new gas piping for new boilers.
- Furnish and install necessary piping and piping accessories to connect new boilers to hot water distribution system.
- Furnish and install Trane TR200, or approved equal, VFD for existing hot water circulation pumps to distribute the hot water through VAV reheat coils.



- Furnish and install new temperature and pressure gauges for supply and return piping to boiler, temperature range (0-250 °F) and pressure range (0-30 psig).
- Furnish and install a new strainer on the return line to the boiler.

- All new piping shall be labeled and all new valves shall be tagged.
- All ball valves that require insulation shall be furnished with handle extensions.
- Complete electrical tie-ins for new boilers, motorized damper, and new hot water pumps etc.
- Furnish and install new venting system for new boilers.
- Furnish and install new neutralizing tank and associated piping for the boilers.
- Hydro test or pressure test new piping and clean and flush new equipment.
- Assist the boiler manufacturer in the start-up of the new boiler and associated equipment.
- The new work and equipment shall comply with all federal, state and local codes and regulations and with the latest edition of applicable standards, codes and specifications.
- Prepare paper work for all required boiler permits and submit to local building inspector.

ECM TH-2: New Energy Management System

A New Trane Tracer Energy Management System (EMS) consisting of the below general components will be installed to enable direct digital control and monitoring of HVAC equipment.

- Install one (1) Trane web-based "System Controller" (SC); provide graphics (floor plans and equipment flow diagrams), equipment operating schedules, setup alarm parameters, etc.; incorporate equipment and new controllers listed below into new automation system.
- Install one (1) Trane programmable controller (MP581) in boiler plant; provide power wiring (120VAC) for same; incorporate MP581 into building automation system network.
- Install necessary sensors (wells, temperature sensors, pressure transmitters, etc.) as well as end devices (valves, relays, actuators, etc.) to achieve required control sequences for the boiler plant and associated equipment.
- Install network wiring (Trane "Comm5") for forty-three (43) new VAV boxes; plenum rated cabling to be used in concealed locations, EMT for exposed areas and in mechanical rooms (applies to all installed network wiring).
- Program, startup, test, and commission new VAV box controllers (factory-installed Trane VV550s); incorporate into network and provide graphics for each unit.
- Install multipurpose programmable controller (Trane MP580 – factory installed) to start/stop and control new air handling unit (1); install necessary relays, current sensing switches, and other required field devices for same; program, startup, test, and commission new controllers; incorporate into network and provide graphics for each unit.
- Install multipurpose programmable controllers (Trane MP503) to start and stop exhaust fans; install necessary relays and current sensing switches for same; program, startup, test, and commission new controllers; incorporate into network and provide graphics for each unit.
- Complete "as built" drawings.



South River Street Fire Station:

ECM SRF-1: New Overhead Doors

Six (6) New Overhead Doors will be installed in place of the existing six (6) doors for improved operability and energy savings do to less infiltration and improved insulating value:

- Furnish and install six series 592 Thermacore, or approved equal, insulated overhead doors including following components:
 - 1" solid shaft
 - (2) 1/2" DSB glazing for sash section 3rd and 4th
 - (2) sash sections – white aluminum
 - Inside side lock
 - Baked Polyester white finish
 - Standard lift 15" radius
 - 2" angle out Track (#3)
 - Complete Pneumatic edge kit

Main Street Fire Station:

ECM Main-1: Building Envelope Improvement

Building envelope improvement consists of the installation of weather stripping and like materials designed to mitigate or eliminate infiltration around existing doors and, where indicated, the installation of batt or blown-in insulation to improve U-value.

- Weather-strip one (1) single interior attic door.
- Weather-strip two (2) single exterior doors.
- Add R-40 blown in cellulose to approx. 800 sq. ft.
- Add R-20 to walls of locker room in the attic approx. 300 sq. ft.

Police Station:

ECM PS-1: Building Envelope Improvement

Building envelope improvement consists of the installation of weather stripping and like materials designed to mitigate or eliminate infiltration around existing doors, the sealing of penetrations such as ductwork openings and, where indicated, the installation of batt or blown-in insulation to improve U-value.

- Weather-strip six (6) single exterior doors.
- Weather-strip one (1) single interior boiler room door.



- Weather-strip three (3) – 10' x 10' overhead doors. (bottoms only)
- Seal existing weather-stripping of three (3) – 10' x 10' overhead doors.
- Seal perimeter of the chimney.
- Seal perimeters of the ducting.
- Insulate existing duct work.

Recreation Center

ECM RC-1: Building Envelope Improvement

Building envelope improvement consists of the installation of weather stripping and like materials designed to mitigate or eliminate infiltration around existing doors, the sealing of penetrations such as ductwork openings and, where indicated, the installation of batt or blown-in insulation to improve U-value.

- Weather-strip six (4) single exterior doors.
- Install an attic hatch
- Insulate, weather-strip, and latch the hatch
- Add R-20 blown in cellulose to approx. 800 sq. ft.

EQUIPMENT LIST

Furnace Brook Middle School:

Equipment Type	Make	Model No:	Capacity	Qty
Variable Frequency Drives	Trane	TR200	30 HP	2
Weather-strips	National Guard or equal	108NA	NA	various
Door Brush Seals	Memtech or equal	Astragal	NA	various

Martinson Elementary School:

Equipment Type	Make	Model No:	Capacity	Qty
Boiler	HB Smith or equal	28-HE-S-10	2,513 MBH	2
Condensate receiver	Shipco or equal	DMC	Between 25 to 80 gallons Capacity	1
Air Cooled Condensing Units	Copeland or Krack	FJAL or HTST	0.25 HP to 1 HP	1



South River Elementary School:

Equipment Type		Model No:	Capacity	Qty
Boiler	HB Smith or or equal	28-HE-S-7	1,722 MBH	2
Condensate receiver	Shipco or equal	DMC	Between 25 to 80 gallons Capacity	1
Unit Ventilators	Trane	VUVE or HUVC	750 CFM to 1200 CFM	27
Air Handling Units	Trane	CSAA	Various	4
Energy Management System	Trane	NA	NA	One (1) SC based Web Controller, One MP 581
Weather-strips	National Guard or equal	108NA	NA	various
Door Brush Seals	Memtech or equal	Astragal	NA	various

Eames Way Elementary School:

Equipment Type		Model No:	Capacity	Qty
Boiler	HB Smith or equal	28-HE-S-4	931 MBH	2
Condensate receiver	Shipco or equal	DMC	Between 25 to 57 gallons Capacity	1
Unit Ventilators	Trane	VUVE or HUVC	750 CFM to 1200 CFM	22
Air Handling Units	Trane	CSAA	Various	2
Energy Management System	Trane	NA	NA	One (1) SC based Web Controller, One MP 581
Windows	Inline Fiberglass Windows	Custom Unit	U value 0.30	4,391 sq ft of space to be covered

Daniel Webster Elementary School:

Equipment Type		Model No:	Capacity	Qty
Boiler	Viessmann or equal	Vitoden 200 WB2B870	370 MBH	6
New Pumps with new motors	Armstrong or equal	Series 4300 or 4382	To be determine	2 (one dual arm pump)
Unit Ventilators	Trane	VUVE or HUVC	750 CFM to 1200 CFM	28
Air Handling Units	Trane	CSAA	Various	3
Energy	Trane	NA	NA	One (1) SC



Management System				based Web Controller, One MP 581
Windows	Inline Fiberglass Windows	Custom Unit	U value 0.30	6,815 sq ft of space to be covered
Air Cooled Condensing Units	Copeland or Krack	FJAL or HTST	0.25 HP to 1 HP	1

Governor Winslow Elementary School:

Equipment Type		Model No:	Capacity	Qty
Air Cooled Condensing Units	Copeland or Krack	FJAL or HTST	0.25 HP to 1 HP	1

Marshfield Town Hall:

Equipment Type		Model No:	Capacity	Qty
Boiler	Viessmann or Or equal	Vitoden 200 WB2B870	370 MBH	2
Variable Frequency Drive	Trane	TR200	To be determine	2
Variable air Volume boxes	Trane	VariTrane	100 CFM to 500 CFM	43
Air Cooled condensor for DX cooling	Trane	CAUJC-50	50 tons	1
Air Handling Unit	Trane	CSAA	Upto 13,000 CFM	1
Energy Management System	Trane	NA	NA	One (1) SC based Web Controller, One MP 581

South River Fire Station:

Equipment Type		Model No:	Capacity	Qty
Overhead Door	Overhead Doors	Thermacore series 592	NA	6

Main Street Fire Station:

Weather-strips	National Guard or equal	108NA	NA	various
Door Brush Seals	Memtech or equal	Astragal	NA	various



Police Station:

Weather-strips	National Guard or equal	108NA	NA	various
Door Brush Seals	Memtech or equal	Astragal	NA	various

Recreation Center:

Weather-strips	National Guard or equal	108NA	NA	various
Door Brush Seals	Memtech or equal	Astragal	NA	various