



Fairfield High School Cafeteria Air Conditioning

Fairfield, Connecticut

M.E.P. BASIS OF DESIGN DOCUMENT

Prepared for:

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HEATING, VENTILATION AND AIR CONDITIONING

HVAC Demolition

Remove (2) existing rooftop RTU's which presently serve the cafeteria area. Remove all associated distribution ductwork on roof and in ceiling cavities.

Remove (1) existing rooftop RTU's which presently serve the teacher's lounge. Remove all associated distribution ductwork on roof and in ceiling cavities below.

Remove existing steam and condensate from RTU's back to mains, cap and make safe. Remove all associated distribution ductwork both in spaces as well as roof mounted supply and return ductwork.

Existing exterior wall unit ventilators (UV-1-5) outside intake dampers shall be removed and insulated covers shall be provided on exterior of building to seal outdoor air openings. Controls to be upgraded. See new work for additional scope.

Remove existing roof mounted exhaust fan EF-B-1 and cap and seal roof penetration. Remove existing exhaust ductwork above ceiling in cafeteria, including grills.

Remove ceiling tiles and grid in area of renovation to allow access for new construction.

Note: The assumption has been taken that there is no asbestos or lead in the area of work. Remediation is not included in this scope of work.

HVAC New Work

Provide new DDC controls for each wall unit ventilator interlocked to associated VRF systems to provide coordinated heating sequences. Unit ventilators will wash exterior wall in the heating season. Steam valve opening in (UV-1-5) will be the 1st stage of heating and the fan control the 2nd stage. Outdoor intake damper shall remain closed. Insulated cap on the exterior of the building behind the existing louver shall be provided on all (5) unit ventilators. Damper actuator shall be removed. Steam and condensate piping to remain. Unit heater controls shall be upgraded to DDC. (See Alt.#1 below)

ALTERNATE #1

Contractor to provide an alternate to include new steam control valves and steam condensate traps for all (5) unit heaters in cafeteria.

Provide new roof mounted Direct Outdoor Air System (DOAS) unit, Trane Horizon OAGD360, or equal, with digital scroll compressors for each circuit located on new galvanized support steel near the old EF-B-1 location. DOAS shall be capable of delivery 5,000 CFM of 100% outside tempered air to cafeteria spaces for ventilation as well as kitchen hood make-up. Unit shall have the capability to reduce CFM via VFD on supply fan. Outdoor air quantities for ventilation requirements and make-up for kitchen hoods

vary. Unit shall be provided with low leakage dampers. Two (2) Space CO² sensors shall monitor space CO² levels compared with outdoors and provide required CFM of ventilation air. Provide new roof penetrations for supply air ductwork. Provide insulated supply ductwork in ceiling cavity to allow even distribution of outside ventilation air through eight (8) new ceiling supply grilles. DOAS Unit will also serve adjacent Student center ventilation via interior supply ductwork. Provide new insulated steam and condensate piping to new steam coil in DOAS. DOAS shall communicate with kitchen hood exhaust system via DDC. Kitchen system shall dictate DOAS to run should exhaust fan speed be above XX as set by TAB. DOAS through DDC shall signal supply fan speed as required to maintain proper make-up air.

Provide new roof mounted VRF air cooled Trane City Multi modules located on existing structural steel previously used for old Rooftop Unit. Additional structural cross supports shall be provided. Units shall be Model TUHY2643 or equal. Capable of providing 264 MBH of cooling and 296 MBH of heating to nine (9) associated 36 MBH ceiling cassettes in cafeteria, and two (2) 30 MBH cassettes in server area, and two (2) 24 MBH wall mounted cooling and heating units located in the adjacent office space ceilings. (Sizes and quantities may vary, refer to HVAC plan).

Provide all associated refrigerant piping from roof mounted VRF condensing units to all associated ceiling cassettes. Provide BC controllers and individual refrigeration isolation valves on all refrigerant circuits. Piping shall include insulation on all suction lines. Exposed refrigerant insulation shall have aluminum covers to protect insulation from UV rays.

Provide new steam and condensate piping to both RTU's for steam coil heating. Steam control valves, strainers, traps, drip legs and associated trim required.

Provide insulation for new steam and condensate piping. Provide insulation saddles on all piping.

Provide package rooftop air handling unit serving Teachers' lounge, Trane model THC or equal. Unit shall be approximately 2,000 CFM with DX cooling and steam heating coil. RTU shall consist of the following components, in the direction of airflow: intake hood, pre & high efficient cartridge filters, modulating steam heating coil, dx cooling coil, supply fan & discharge plenum. Unit refrigeration system shall have variable speed scroll compressor and modulating hot gas reheat coil for uniform discharge air temperature and humidity control. Unit capacity shall be 2,000 CFM with 5 tons cooling capacity. Provide new insulated steam and condensate piping to new steam coil in packaged rooftop unit. RTU shall utilize existing galvanized structural steel, modifications may be required. Contractor to provide new roof penetrations for supply and return ductwork. New insulated supply ductwork distribution will be provided and return plenum with sound lined elbow back to new RTU.

Contractor to provide new Kitchen Hood Controls to retrofit of the existing Vent-Master kitchen hood. Existing back to back hood is approximately 14'-0" long x 8'-0" deep'. Existing exhaust fan is a Cook 300 CPSA, 3.0 H.P. 460v 3 phase designed for 10,200

CFM at 1.0"W.C.. Hood Retrofit shall utilize a combination of optic and temperature sensors to modulate associated exhaust and make-up air speeds between 30-100%. The existing kitchen make-up fan will require a 3.0 H.P. VFD. The associated system shall communicate via DDC to both the existing make-up supply air system and the cafeteria DOAS to control fan speeds to maintain the proper make-up air. Both supply and exhaust fans will be provided with ABB drives or equal. Controls shall be by Melink, EcoAzur or equal.

Adjacent Area Air Systems

Existing rooftop AHU and associated distribution ductwork serving the adjacent spaces shall remain as is. Refer to scope limit lines.

Air Distribution Systems

Existing toilet, dishwasher, and janitor exhaust systems shall remain as is.

Building Automation System

Temperature control and building management functions will be provided through an extension of the existing. Automated Logic Corporation shall provide direct digital control (DDC) system. The DDC system shall provide control and monitoring of all central and local terminal equipment. Packaged equipment will need to be coordinated with DDC. DDC shall enable and provide set-points schedules etc.

ELECTRICAL

Electrical Demolition

The electrical feeders serving equipment to be removed shall have electrical feeders removed back inside the building and made safe. This shall include the existing three (3) RTU's as well as the cafeteria exhaust fans located on the roof.

The existing lighting in the cafeteria area are mostly pendant hung lighting via aircraft cable. The server area has a 2'x2' ceiling grid and some track lighting. Teacher's lounge has a combination of both. All existing lighting shall remain. The existing pendant lighting in the immediate area of construction shall be removed and protected to allow construction in these limited areas as required by the HVAC contractor. Coordinate with all other trades.

The existing Fire Alarm System shall remain active and functional during renovation. Protection of equipment during work needs to be carefully coordinated with fire alarm contractor. Area smoke detectors shall be covered as required to minimize nuisance alarms during construction. There will be minimal fire alarm work required.

Electrical New Scope

Provide new electrical feeders to each new roof mounted device (VRF, DOAS and RTU) from associated power panel with proper voltage and capacity.

Provide 120V GFI duplex outlet at VRF, DOAS and RTU for service.

Provide exterior lighting on roof at VRF, DOAS and RTU.

Provide dedicated electrical circuit with local disconnects at each Dx terminal ceiling unit. This shall include wall hung units as well. Refer to HVAC drawings for location and quantities.

Provide electrical power with local disconnects at each condensate pump location. Pumps shall be hard wired as required by code; no cords allowed.

The coordination arc fault study shall be updated for any new electrical panels should they be required.

Location of new rooftop equipment may require removal and/or relocation of Solar panel array system. Relocation of any existing Solar panels on roof shall be done by the panel manufacturer.

PLUMBING/FIRE PROTECTION

Existing Plumbing and Demolition

There is limited to no plumbing demolition in this scope of work.

New Plumbing Scope

New plumbing shall include new condensate drain lines from all new VRF DX cooling units. This shall include ceiling cassettes and wall hung units. Provide insulated condensate drains from each system to nearest janitorial sink or floor drain with an approved airgap connection. Condensate mains shall be gravity, pitched in direction of flow, with clean outs on every change in direction for maintenance purposes. Condensate pumps are to be limited. Factory pumps for lift will be utilized where needed. Refer to mechanical drawings for locations of DX cooling units.

Existing Fire Protection and Demolition

The existing cafeteria area is protected with a wet pipe sprinkler system. All existing mains and branches are black steel and the pipe drops to the existing sprinklers are black steel as well. The existing mains are located near the underside of the roof structure and can remain, permitting that pipe locations are not in conflict with new HVAC work. Full

sprinkler coverage is maintained in the areas of renovation and no demolition of sprinkler main work is expected.

New Fire Protection Scope

Existing sprinkler piping and hangers shall be coordinated with new equipment although minimal work will be required. Existing sprinklers and piping in the cafeteria spaces will remain.

All new sprinkler work shall comply with the 2015 edition of NFPA-13, and local, State and Fire Insurer requirements per NFPA requirements.

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