

Oceanside Union Free School District

District Wide Air Conditioning Study



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Oceanside Union Free School District

Retrofitting any existing school building with air conditioning is somewhat different, and considerably more complicated than providing air conditioning in a new building. The available options in existing buildings are more limited because many conventional methods involve systems that are required to be supported by the building structure and or concealed by the building's ceilings and walls. In review of the Oceanside Schools, we have considered the following four (4) air conditioning systems.

Thru-Wall Windows A/C Units

Central Chilled Water System

Rooftop Heating / Cooling Units

Unit Ventilators with Exterior Air-Cooled Condensers

Thru-Wall Window A/C Units



PRO

- A short-term measure.

CONS

- Not efficient or effective method.
- Thru-wall and ductless split systems used with existing unit ventilators, work as separate systems. The amount of air treated from the two units are not equal and can impact proper ventilation.
- Existing building electrical services cannot support the addition of these units in every classroom without upgrading the service and adding additional distribution panels.

Chilled Water Systems



PROS

- Large centralized equipment can provide better efficiency than other units.
- Chilled water flow is modulated to the chilled water coil in the unit, which will provide infinite modulation of cooling capacity.

CONS

- Difficult, and impractical, to run new chiller water piping concealed within an existing building.
- New ceilings and sheetrock chases would be needed throughout the building to conceal new piping.
- Cost to install 2" to 6" piping throughout the building would be expensive. New ceilings and chases will be required to conceal the new piping.
- The existing electrical services will need to be upgraded to handle the new A/C loads.
- One of the more expensive options.

Heating and Cooling units



PROS

- Humidity in the space can be controlled by the new rooftop unit.
- Existing unit ventilators can be eliminated.

CONS

- Not practical in a multi-story building or buildings with peaked or gabled roofs.
- Many roof and floor openings will be needed to install ductwork throughout the spaces.
- New ceilings and soffits will be needed to conceal duct work.
- Existing unit ventilators would need to be removed including all electric and pneumatic controls. Existing fresh air openings will need to be infilled with brick and block, and new casework installed in the space where the existing unit ventilators removed.
- Will require the existing electrical service to be upgraded to handle the new A/C loads.
- The cost would be very expensive to integrate the new ductwork throughout the existing buildings.



Unit Ventilators with Air Cooler Condensers



PROS

- Work is somewhat limited to areas along the perimeter wall where the current unit ventilator is located. A small chase will be required to conceal any refrigerant piping and new electrical feeds
- Existing classroom and corridor ceilings can remain and opened as needed to run new electric lines to the new unit ventilators.
- No ductwork would be required for most rooms, except for small offices receiving split evaporators and outdoor condensing units.
- Minimal piping required for refrigerant piping and condensate drains.
- This option is the least expensive and most practical option base on the existing conditions in the Oceanside School District
- An added benefit to this option is that all original and antiquated unit ventilators and controls will be replaced with new modern technology, providing the proper amount of ventilation as required by current mechanical code.

CONS

- There are only two cooling stages, which will yield larger swings in room temperatures versus a chilled water system. This system will provide the same temperature swings as a rooftop unit would.
- Condensing units, especially at the pitched roof buildings, will be on grade and or mounted to an exterior wall. They will be visible but can be surrounded with a fence if there is adequate space between the surrounding walks and exterior walls.
- Some modification of the existing window wall casework will need to be modified to allow for new larger, in size, unit ventilators.
- Will require the existing electrical service to be upgraded to handle the new A/C loads.

RECOMMENDATIONS

Unit Ventilators with DX coils and air cooled condensers

This option meets all the requirements of the Code and the New York State Education Department and includes upgrading of existing and antiquated unit ventilators in each space with new units while providing each room with air conditioning, creating a well-balanced, climate-controlled room.

Proposed Construction Costs – The general scope to work to implement Air Conditioning throughout the Oceanside School District would include but not limited to;

- Removal of all existing unit ventilators
- Removal of all existing window air conditioners
- Upgrading each buildings electrical service to accommodate the new air conditioning loads
- Modification of all existing interior cabinets/casework to allow for new unit ventilators
- Installation of new unit ventilators with DX coils
- Installation of exterior condenser units, either at grade or on the roof
- Provide associated controls to tie new units into the existing building management system
- Provide all piping and electrical connections required for the new units.

The Preliminary Construction Cost would be approximately \$50,000,000. This would include all construction costs, fees and contingencies associated with the project.