

# Madras Primary School HVAC Retrofit

Madras, OR

## Project Profile

Prime Consultant  
JJC Engineering

Mechanical Engineer  
JJC Engineering

General Contractor  
Sunwest Builders

## Project Features

Size  
60,000 sq. ft.

Contract Cost  
\$650,000 (est.)

Completion  
October 2012 (est.)



photography by JJC Engineering

Jefferson County School District 509-J needed to lower their energy cost for operating Madras Primary School. Originally built in 1939, its low pressure steam heating system was still in operation but at the end of its useful life. School district maintenance staff had been doing their best to keep things adequately maintained, though increasingly it had become apparent that an HVAC retrofit was necessary for continued occupant comfort. The district received technical assistance from the Oregon Department of Energy's SB1149 program to have an energy audit conducted. JJC Engineering was retained, as the prime consultant, to design and implement an energy efficient HVAC retrofit in accordance with the audit's recommendations. Several challenges arose in this building's HVAC retrofit design process for JJC Engineering.

The age of the school required an in depth as-built survey to establish where the gaps in code compliance needed to be addressed, especially with respect to HVAC related fire/life safety. Most all of hallways and exit corridors, though upgraded with fire sprinklers and rolling fire doors, were otherwise unrated at the ceiling and walls. Several site visits and many meetings with school district facilities staff were required to document all of these existing conditions and mitigate the potential for "unforeseen discoveries" which could happen during construction and ultimately drive up costs. JJC Engineering worked proactively with the local jurisdiction, in response to this project's special requirements, in order to establish the discretionary criteria of code requirements

(continued next page)



www.jjceng.com  
jjc@jjceng.com  
(541) 728-3624  
70 SW Century DR. STE 100-156  
Bend, OR 97702

## Madras Primary School HVAC Retrofit

Madras, OR

### Interesting Facts

- The building environmental controls feature Ecobee wi-fi enabled thermostats which provide 90% of DDC system capabilities for about 10% of the cost.
- Permits for construction were issued without a single plan review comment.
- Much of the old steam boiler heating system is being salvaged to offset the cost of the HVAC retrofit.



photography by JJC Engineering

that the building officials would need in order to secure permits. Initially, the energy audit design recommendations called for abandoning the existing steam system and retrofitting the entire school with 25 packaged roof top units (RTU's). While easy to build consensus for abandoning the existing steam system, the building's steep double-pitch roof didn't readily lend itself as a good fit for an HVAC retrofit entirely composed of RTU's. JJC Engineering's creative solution for this challenge was to design the HVAC retrofit using multiple split system furnaces, since they could be easily placed within the existing attic space and would not require any structural modifications to the roof. Agreement was reached with the project team on this solution and JJC Engineering went to work on the mechanical design;

provided oversight, coordination, and project management for the construction document preparation; and retained sub-consultants for the electrical and structural design portions of the project.

During construction, JJC Engineering, general contractor, and mechanical contractor have been in close contact, constructively and positively working together with the school district executing this HVAC retrofit project's work scope. A few value engineering meetings have kept this project's budget manageable, without limiting the much needed environmental comfort upgrade for all 22 classrooms, kitchen, library, staff offices, gymnasium and cafeteria. We look forward to an on time, and under budget, substantial completion in October 2012.



www.jjceng.com  
jjc@jjceng.com  
(541) 728-3624  
70 SW Century DR. STE 100-156  
Bend, OR 97702