

## Boiler Replacement at Union Station Hartford, CT

### Project Description:

#### Location

Hartford, CT

#### Owner

Greater Hartford Transit  
District

#### Duration

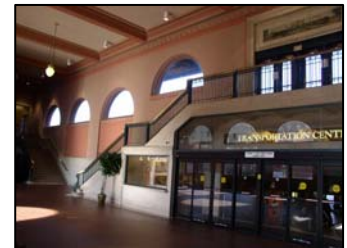
2009 -2010

#### Construction Cost

\$600,000

AI Engineers, Inc, has teamed with GWG Architects for the On-Call contract for Architecture & Engineering services to the Greater Hartford Transit District at the historic Union Station Transportation Center. Current assignments include existing conditions survey, base plan preparation, boiler replacements, canopy and bus berthing feasibility analysis, and transit bus site planning.

AI was responsible for the design, project management, and construction administration of the replacement of this historic building's 25-year old boiler plant. The existing plant contained a twenty year old steam and a twenty year old hot water boiler as well as a steam to hot water converter and multiple secondary pumps. The boilers were originally dual fuel oil/natural gas but had only operated using natural gas. The original central portion of the facility was heated with steam and the newer renovated north and south ends as well as the bus station area was heated with hot water. Field investigation observed that the steam/hot water converter was inoperable, that numerous piping and pumping inconsistencies existed, the boilers were being operated under manual on/off control and that significant boiler repairs were pending. In review of the existing conditions with the client, the decision was made to use a single fuel, natural gas because the previous dual fuel option had not proven successful. It was also determined that the new hot water and steam systems should be independent of each other for simplicity and ease of maintenance. It was determined that the replacement of the boilers could not be achieved in a single period of construction due to the constraints of the heating season and equipment lead time. Therefore, the project was split into two phases.



### Salient Features

- Coordinate with Utilities
- Design of Mechanical
- Design of HVAC
- Design of Plumbing
- Plan Preparation
- Quantity/ Cost Estimate
- Specification Preparation

## Boiler Replacement at Union Station (*Continued*)

Hartford, CT

### Project Description:



Phase 1 was the replacement of the hot water boiler since it was the closest to failure. The new design replaced the single oversized hot water boiler with two new Aerco high efficiency (15:1 turndown) forced draft gas low NOx condensing boilers with interlocked boiler turn down and lead-lag controls. In addition, the existing steam to hot water converter was removed and new hot water pumps with VFDs were specified. New exhaust flues and breeching for the forced draft and atmospheric gas fired equipment was installed in the existing facility boiler room chimney. Phase 1 design was completed in August 2008, bid in September 2008, substantial completion achieved in December 2008 and project closeout in February 2009. Operation of the Phase 1 system for the remainder of the 2008-2009 heating season reduced the anticipated fuel costs by approximately 50%.

Phase 2 was the complete replacement of the steam boiler system and its auxiliaries including condensate transfer systems and the fuel oil pumps and piping. The new design replaced the single oversized steam boiler with two new Bryan AB300 side accessible flexible tube packaged forced draft gas boilers with interlocked lead-lag controls. The new boiler breeching was connected to the exhaust flue previously installed under phase 1. Matched packaged auxiliaries for the boilers including automated chemical treatment, automatic blowdown, boiler feedwater system and a condensate transfer system were specified and installed. Phase 2 design was completed in April 2009, bid in May 2008, substantial completion achieved in September 2008 and project closeout is expected in October 2009. All phases of the project were accomplished without closing the facility or disrupting the occupants. Total project value \$700,000.