

Combined Heat and Power (CHP) Plant Construction at the Cheyenne, WY VAMC (VA701-13-D-0006)



Pre-Bid Meeting Agenda 05-12-2014

1. Project Summary

- Scope of work is to provide 90% of the annual electricity use at the VAMC in Cheyenne, and utilize as much of the waste heat as possible.
- A small portion of the existing boiler building (Building #13) shall be demolished and a new addition shall be built.
- Space and connections shall be provided for a future second CHP unit.
- Power will be generated by a new reciprocating gas fired engine.
- Power generated shall be tied into the VA owned underground distribution system via an existing manhole. Power output shall be controlled so that it does not exceed VAMC use (no export).
- Piping shall be provided throughout a number of buildings to allow hot water to be distributed.
- The system will be fully commissioned when construction is complete.

2. Mechanical Work

- Engine waste heat will be used for building heat and domestic hot water heating in building one. Heat will be recovered from the engine exhaust and from low and high temperature circuits that cool the engine jacket.
- Heat Recovery Steam Generator (HRSG): engine exhaust will pass through an HRSG to generate steam. Steam, feed-water, and blow-down will be piped to the existing boiler room and tied in. Engine exhaust will be routed to a silencer on the roof of the new addition
- Engine Jacket Heat Recovery-High Temperature Circuit: high temperature heat from the engine jacket will transfer heat via heat exchanger to a new glycol heating loop. The heat exchanger will be located in the new addition, adjacent to the generator, and will include a circulator pump. Excess heat will be diverted to a high temperature circuit on a rooftop dry cooler.
- Engine Jacket Heat Recovery-Low Temperature Circuit: low temperature heat from the engine jacket will be used to preheat boiler make-up water via a storage type heat exchanger located in the new addition. Excess heat will be diverted to a rooftop dry cooler.
- The new addition will be ventilated using variable speed exhaust fans and dampered louvers.
- Pump room: Equipment for a hydronic heating loop will be located in an existing room in the boiler plant. The equipment includes two pumps, expansion tanks, and a filter/separator. Two steam heat exchangers will also be located in this room to provide supplemental heat for the loop.
- Hydronic Loop: an 8" hot water line will be routed from the pump room, through the ceiling of the boiler room, through the crawlspace of the warehouse, through grade to building one, and then through the crawl space in building one. Taps will be made in the line in building one to provide heat to existing hydronic systems.

3. Controls:

- The Genset control will operate the engine and switchgear.
- The existing boilers will be upgraded with modern electronic controls
- CHP unit shall have dedicated computer and workstation for monitoring and control of the CHP within the existing Boiler Control Room.
- Controls will interface with the existing boiler plant control system for monitoring by the boiler plant operators.
- Both systems will interface with the existing Schneider Energy Monitoring System for Measurement and Verification. Refer to the MI drawings.

4. Electrical Work

- Power from the CHP unit shall be connected into the existing underground VA campus distribution system.
- A step up transformer and sectionalizing cabinets shall be installed at grade next to manhole at the end of Building #12.
- The CHP unit shall run in parallel with the utility and be controlled so that it does not export power to the utility grid.
- Provide underground conduits and pads for future equipment.

5. Structural Work

- The new single story building will be located directly adjacent to but structurally isolated from the existing building.
- The new engines located inside the building will require thicker, isolated foundations separate from the surrounding floor slab-on-grade to eliminate transmission of vibration and minimize the transmission of noise. Floor-mounted generators, pumps, heat exchangers, tanks and electrical panels will be supported on housekeeping/equipment pads to an elevation recommended by the equipment manufacturer for ease of maintenance. Anchorage for all equipment will be in accordance with the seismic code and manufacture requirements.
- A concrete slab over composite metal deck will support equipment located on the roof. This roof system was also chosen to help reduce sound transmission through the building roof. Structural steel beams and girders spanning to structural steel columns will provide the gravity load resisting system. Beam and girder locations at the roof will be coordinated with the proposed equipment to provide the necessary openings and support. Structural steel framing at the roof also allows for flexibility in piping and equipment attachments.
- The exterior walls of the Annex will be brick veneer with concrete masonry unit backup. The brick veneer was chosen to match the exterior of the existing building and the concrete masonry units will be solid grouted to help reduce sound transmission through the walls.
- New pipe supports have been designed to support the 8" HWR/HWS run across the existing boiler house.

- An independent, isolated slab is being provided for the future reciprocating engine/generator based on the size of the proposed unit. Not knowing the timeline when this future equipment would be installed, we have provided drawings showing support sizes and spacing for the future equipment that is identical to the equipment proposed for this phase.

6. Site Work

- Trenching to connect the electricity from the CHP unit to the underground distribution system shall be required. Backfill and patching to match the existing surfaces is included.
- Equipment pads at grade to support the mech and electrical equipment.
- Demo work and relocation of existing underground utilities is included.
- Landscaping around new addition is included.
- Bollards around new addition are included.

7. Fire Protection

- Provide a complete wet type sprinkler system for the existing boiler building as well as the new addition. There will be dry type heads mounted in the existing gas entrance room.
- Provide new fire alarm devices as outlined on drawings and tie into the existing system.

8. Architectural Work

- This facility has been part of the State Historical Preservation Office review.

9. Site Walk

- Locations for generator, chiller, heat recovery equipment, piping, controls, etc. will be identified.