

PBEEEP

State Government

Public Buildings Enhanced Energy Efficiency Program

SCREENING RESULTS FOR VETERANS SERVICES BUILDING



November 29, 2010

Summary Table

Facility Name	Veterans Services Building
Location	20 West 12st Street St. Paul, MN 55155
Facility Manager	Gene Peterman
Number of Buildings	1
Interior Square Footage	87,648
PBEEEP Provider	Center for Energy and Environment (CEE) (Neal Ray)
State's Project Manager	Pat Ferrin
Date Visited	No site visit performed
Annual Energy Cost	\$153,238 (Source: B3; 2009)
Utility Company	District Energy St. Paul (Hot and Chilled Water), Xcel Energy (Electricity)
Site Energy Use Index (EUI)	94 kBtu/ft ²
Benchmark EUI (form B3)	107 kBtu/ft ² *

*Due to the partial screening that was completed, the B3 data could not be fully verified and as a result, the B3 benchmark was not updated at this time.

Screening Overview

The goal of screening is to select buildings where an in-depth energy investigation can be performed to identify energy savings opportunities that will generate savings with a relatively short (1 to 5 years) and certain payback. The partial screening of the Veterans Services Building was performed by the Center for Energy and Environment (CEE) with the assistance of the facility staff. No building walk-through was conducted. This report is the result of the information obtained through the partial screening.

Future Candidate for Investigation

The Veterans Service Building is not recommended for investigation at this time. The Veterans Services Building had a recommissioning study performed in January 2009 and an ex-filtration/energy study completed in November 2009 based on information obtained in the PBEEEP screening process. The ex-filtration study identified six energy conservation measures, which are planned for implementation that is slated to start in 2010 (per discussions with Dept. of Administration staff). The scope of work for the implementation project requires construction on and around the building HVAC equipment. Typically, a construction environment of this nature will result in varied operating conditions that may not be representative of true operating conditions for equipment and systems. This makes establishment of baseline performance and energy usage difficult.

Integration of the project into PBEEEP is not recommended. The study that was completed was not originally scoped to incorporate data collection and analysis requirements of the PBEEEP project framework and so does not appear to meet PBEEEP's standards. The project scoping is

complete and implementation plans and funding are in place. It would be expected that additional time and funds would be required to revisit the energy study in order to complete baseline data (A PBEEEP Energy Investigation takes a minimum of six months to complete). Additionally, PBEEEP currently utilizes ARRA stimulus funding to support the project cost-share. This would be expected to add complexities and costs to the facilitation and management of the project which have not been included in the current scope of work.

PBEEEP staff was made aware of the current project plans while on-site to conduct a multi-building screening for Veterans Services, Centennial, and Transportation buildings. Upon learning this information, CEE ceased work and a full screening was not completed at the site; however, the data obtained and observed through the Screening Process is included in this report. PBEEEP recommends the project be closed at this time and re-evaluated for participation in PBEEEP following the completion of the active project and once a full year of stable baseline energy usage data can be established.

Building Name	State ID	Area (Square Feet)	Year Built	Recommended for Investigation
Veterans Services	G0231010662	87,648	1953	N

The Veterans Service Building is one building consisting of 87,648 interior square feet. The table below lists the known equipment within the building. The building is controlled by a Honeywell EBI automation system. Based on a limited screening of the building, there are a total of 7 AHUs, a chilled water system, a hot water system and VAV boxes. The VAV boxes associated with the AHUs are on the automation system.

Mechanical Equipment Summary Table	
1	Building Automation System
87,648	Square Feet
8	Air Handlers
4	Chilled Water Pumps
2	Heat Exchangers
2	Hot Water Pumps
1	Fan Coil Unit
79	VAV Boxes
7	Exhaust Fans
300	Points for trending (estimated)

The screening process is designed to determine the likelihood that an energy investigation will lead to a cost effective project that produces energy savings. PBEEEP does not recommend that buildings with major projects involving or affecting HVAC systems and equipment go through the program.

Veterans Services Screening Overview

The goal of screening is to select buildings where an in-depth energy investigation can be performed to identify energy savings opportunities that will generate savings with a relatively fast (1 to 5 years) and certain payback. The screening of the Veterans Service Building was performed by the Center for Energy and Environment (CEE) with the assistance of the facility staff. This report is the result of that information.

The Veterans Service Building is one building in the State Capitol Complex. It has a total of 87,648 ft² consisting of five floors and a basement. It was originally constructed in 1953.

Mechanical Overview

There are a total of eight AHUs, six of which have VFDs on them. There are a total of 79 VAV boxes associated with the AHUs at the complex. Chilled water is supplied to the building from the Capitol Complex chilled water loop distribution system. The building receives heating water from St. Paul District Energy. The heating system consists of a heat exchanger and two hot water pumps. The chilled water system consists of two different piping systems. Both consist of three chilled water pumps. One serves the east side of the building and the other serves the west side

Controls and Trending

The building is controlled by a Honeywell EBI automation system. There are a total of 8 AHUs, a chilled water system, a hot water system and the VAV boxes associated with the AHUs are on the automation system.

Lighting

There was not an actual site inspection done so the lighting is not known.

EUI B3 Benchmark Overview

The actual energy user index (EUI), as computed from utility bills and square footage, is currently 95 kBtu/ft², which is less than the B3 benchmark score of 107 kBtu/ft². The actual EUI is 11% lower than the benchmark; however the benchmark value may be too high (for example if spaces are improperly classified as laboratories or summer cooling hours are too high the benchmark value will be too high). On average the state median scores are 23% lower than their corresponding B3 Benchmarks

Metering

The exact number of meters was not determined; however, based on utility data spreadsheets, there is one electrical meter, one chilled water meter, and one hot water meter.

Veterans Services			State ID# G0231010662		
Area (sqft)	87,648	Year Built	1953	Occupancy (hrs/yr)	4,368 (per B3)
HVAC Equipment					
Description	Type	Size	Notes		
AHU-1E	Variable Air Volume		VFD		
AHU-1W	Variable Air Volume		VFD		
AHU-2	Variable Air Volume		VFD		
AHU-3	Variable Air Volume		VFD		
AHU-4	Variable Air Volume		VFD		
AHU East Basement	Variable Air Volume		VFD		
AHU-NOC	Constant Volume				
Fan S-7	Constant Volume				
CHWP-3	VFD				
CHWP-4	VFD				
CHWP-12	VFD				
CHWP-13	VFD				
HX-1					
HWP-1	VFD				
HWP-2	VFD				
HX-2					
Domestic Storage Tank					
Domestic HWP					
FCU 01					
79 VAV Boxes					
7 EFs					
Electric Vault Ventilation System	Constant Volume				

Points on BAS (Veterans Services)	
Description	Points
AHU East Basement AHU-1E AHU-1W	OA damper %, OA damper setpoint %, OA Enthalpy, MAT, MAT setpoint, HW valve %, HW coil DAT, CHW valve %, CHW coil DAT, Fan status, Fan speed, Duct static, Duct static setpoint, Humidity valve %, DAT, DAT setpoint, DA RH, DA RH setpoint, RAT, RA enthalpy, RARH. RARH setpoint, RA CO ₂ , RA CO ₂ setpoint, Economizer enable, Heat/cool mode, Heat/cool mode setpoint, relief damper %
AHU-2 AHU-3 AHU-4	OA damper %, MAT, MAT setpoint, HW valve %, HW coil DAT, CHW valve %, CHW coil DAT, Fan status, Fan speed, Humidifier valve %, DA RH, DAT, DAT setpoint, Duct static, Duct static setpoint, RARH, RARH setpoint, RA CO ₂ , RA CO ₂ setpoint, RA enthalpy, RAT, Relief damper %, Heat/cool mode, Heat/cool mode OAT setpoint, Economizer enable setpoint
AHU NOC	OA damper %, OA damper setpoint %, OA Enthalpy, MAT, MAT setpoint, HW valve %, HW coil DAT, CHW valve %, CHW coil DAT, Fan status, Humidity valve %, DAT, DA RH, DA RH setpoint, RAT, RA enthalpy, RARH. RARH setpoint, Economizer enable, Heat/cool mode, Heat/cool mode setpoint, Room temperature setpoint, Room temperature, Room RH
Chilled Water System	East district CHWST, CHWP status, CHWP speed, District valve %, East Building CHWRT, East Building CHWRT setpoint, Differential pressure, Differential pressure setpoint, West district CHWST, West Building CHWRT
EF	Fan status
Fan S-7	OA damper %, OA damper setpoint %, MAT, Face/bypass damper%, HW valve %, CHW valve %, Fan status, DAT, DAT setpoint, Space pressure, Space pressure setpoint, Relief damper %, RAT, Economizer enable setpoint
Electric Vault Ventilation	OA damper command, Unit heater status, Space temperature cooling setpoint, Space temperature heating setpoint, Space temperature, EA damper command, Fan status, OAT
Building Lighting	Light command
Weather Station	OAT, Relative humidity

Additional Comments
<ul style="list-style-type: none"> Due to the current construction within the facility an energy investigation is currently not recommended.

PBEEEP Abbreviation Descriptions			
AHU	Air Handling Unit	HP	Horsepower
BAS	Building Automation System	HRU	Heat Recovery Unit
CD	Cold Deck	HW	Hot Water
CDW	Condenser Water	HWDP	Hot Water Differential Pressure
CDWRT	Condenser Water Return Temperature	HWP	Hot Water Pump
CDWST	Condenser Water Supply Temperature	HWRT	Hot Water Return Temperature
CFM	Cubic Feet per Minute	HWST	Hot Water Supply Temperature
CHW	Chilled Water	HX	Heat Exchanger
CHWRT	Chilled Water Return Temperature	kW	Kilowatt
CHWDP	Chilled Water Differential Pressure	kWh	Kilowatt-hour
CHWP	Chilled Water Pump	MA	Mixed Air
CHWST	Chilled Water Supply Temperature	MA Enth	Mixed Air Enthalpy
CRAC	Computer Room Air Conditioner	MARH	Mixed Air Relative Humidity
CV	Constant Volume	MAT	Mixed Air Temperature
DA	Discharge Air	MAU	Make-up Air Unit
DA Enth	Discharge Air Enthalpy	OA	Outside Air
DARH	Discharge Air Relative Humidity	OA Enth	Outside Air Enthalpy
DAT	Discharge Air Temperature	OARH	Outside Air Relative Humidity
DDC	Direct Digital Control	OAT	Outside Air Temperature
DP	Differential Pressure	Occ	Occupied
DSP	Duct Static Pressure	PTAC	Packaged Terminal Air Conditioner
DX	Direct Expansion	RA	Return Air
EA	Exhaust Air	RA Enth	Return Air Enthalpy
EAT	Exhaust Air Temperature	RARH	Return Air Relative Humidity
Econ	Economizer	RAT	Return Air Temperature
EF	Exhaust Fan	RF	Return Fan
Enth	Enthalpy	RH	Relative Humidity
ERU	Energy Recovery Unit	RTU	Rooftop Unit
FCU	Fan Coil Unit	SF	Supply Fan
FPVAV	Fan Powered VAV	Unocc	Unoccupied
FTR	Fin Tube Radiation	VAV	Variable Air Volume
GPM	Gallons per Minute	VFD	Variable Frequency Drive
HD	Hot Deck	VIGV	Variable Inlet Guide Vanes

Conversions

1 kWh = 3.412 kBtu

1 Therm = 100 kBtu

1 kBtu/hr = 1 MBH
