

By Amanda Parolise

Parolise is project manager consultant with BuildingSmart Software LLC. Reach her at amckew@yahoo.com.



Building Program Annual Operating Budget For A Central Chiller Plant Retrofit Project

For a building program to be successful and sustainable, it is imperative that the program include an operating budget in addition to a construction budget. Fifteen to 20% of the cost of a building is first cost, and 80% or more of the cost is in the operation of the building over its lifetime. The following is a sample of what the conceptual phase HVAC annual operating budget for a college central chiller plant energy retrofit project, where 24-7 operation is needed to serve several buildings on a campus landscape. As part of this example, the owner has decided on limiting her operating staff to a select few while contracting out the O&M of day-to-day requirements.

When designing a new or renovated central chiller plant, the engineer should refresh his/her memory relative to this basis of design by first going to ASHRAE *Handbook 2011 Applications* and reading chapter 27 on power plants, chapters 36 through 43 relative to building operation and management, chapter 49 on water treatment, chapter 55 on seismic and wind resistant design, chapter 59 on HVAC security, and chapter 61 on codes and standards. Also, a review of the 2012 *Handbook HVAC Systems and Equipment*, chapter 3 central heating and cooling; chapter 12, district heating and cooling; chapter 39 for cooling towers; and chapter 43 for chillers.

Choosing to outsource some or all of the O&M requirements via third-party companies for the day-to-day requirements and/or hiring HVAC service companies for the planned maintenance of the primary equipment start-up and shutdown are two options that an owner may consider. The conceptual design-phase annual operating budget is as follows.

Administrative		
SALARIES, WAGES & BENEFITS		
• Employee salaries & wages	(1) Manager (1) Supervisor (0) Technician	\$ 120,000
• Taxes, health care, etc.		\$ 35,000
• Retirement & benefits		\$ 10,000
OUTSOURCED O&M		
• Project management	(1) Part-time	\$ 25,000
• Technician	(6) Operators	\$ 150,000
• Vendor salaries & wages		\$ 0
• Supplies		\$ 0
SERVICE CONTRACTS		
• Refrigeration equipment	Startup, shutdown, and on-call	\$ 24,000
• Heating equipment	None	\$ 0
• Filters	None	\$ 0
• Emergency generator	By building owner / service contractor	\$ 0
CONSULTANTS		
• CAD (computer-aided drafting)	None	\$ 0
• Energy	None	\$ 0
• Information technology	None	\$ 0
INFORMATION TECHNOLOGY		
• Computerized maintenance management software	None	\$ 0
• Handheld devices	(4) Cell phone + monthly fee	\$ 4,000
EXPENSES		
• Education	None	\$ 1,000
• Conferences	(1) IDEA Conference - October	\$ 1,200
• Offices supplies	\$50.00 per month	\$ 600
UTILITIES		
• Electricity		\$ 430,000
• Chilled water		\$ 0
• Gas		\$ 0
• Oil		\$ 0
• Propane		\$ 0
• District/campus steam		\$ 0
• District/campus chilled water		\$ 0
• District/campus hot water		\$ 0
DOCUMENTATION		
• Printing		\$ 0
TOTAL ANNUAL OPERATING COST		\$ 800,800
TOTAL ANNUAL OPERATING COST/Sq Ft		Not Applicable