

# DACUM Research Chart for High Performance Building Operations Professional

## Produced for



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## Produced by



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# DACUM Research Chart for High Performance Building Operations Profession

DUTIES	TASKS			
<b>A. Analyze Building Operations</b>	A.1 Review building documentation (e.g., SOPs, BMS, MEP)	A.2 Perform Level I site assessment	A.3 Interview facility operators	A.4 Determine equipment performance (e.g., temperature, pressure, schedules)
	A.10 Trend building occupancy/production	A.11 Review capital improvement plan		
<b>B. Maintain Building Operating Efficiency</b>	B.1 Identify BAS discrepancies	B.2 Check for equipment override conditions	B.3 Calibrate equipment controls	B.4 Coordinate repair of deficient equipment
	B.10 Review VFD settings	B.11 Manage preventive maintenance plan	B.12 Manage predictive maintenance plan	B.13 Optimize equipment operating schedules
<b>C. Audit Building Operational Performance*</b>	C.1 Review maintenance and repair log	C.2 Perform utility bill audit (e.g., electric, gas, water)	C.3 Perform disaggregation of utilities (e.g., electric, gas, water)	C.4 Perform facility condition assessment
	C.10 Perform lighting audit	C.11 Perform indoor air quality audit	C.12 Audit equipment sequence of operations	C.13 Audit building/equipment operating procedures
	C.19 Perform life cycle analysis			
<b>D. Create High Performance Building Plans</b>	D.1 Obtain payback analysis	D.2 Modify capital improvement plan	D.3 Prioritize audit recommendations	D.4 Develop formal energy policy
	D.10 Optimize equipment sequence of operations	D.11 Develop operational & performance metrics	D.12 Identify utility rebates	D.13 Develop commissioning plan
	D.19 Develop tenant engagement programs	D.20 Develop water conservation plan	D.21 Review predictive maintenance plan	D.22 Develop measurement & verification policy

\* Audit reports include recommendations for improvement

A.5 Benchmark building performance	A.6 Develop building performance goals (e.g., energy, IEQ, water)	A.7 Identify environmental requirements (e.g., temperature, lighting, ventilation)	A.8 Trend service calls	A.9 Trend utility usage and cost
B.5 Calibrate air distribution systems (e.g., economizers, VAV, air handlers)	B.6 Calibrate central cooling systems (e.g., temperature resets, flow, pressure)	B.7 Calibrate central heating systems (e.g., temperature resets, flow, pressure)	B.8 Calibrate evaporative cooling systems (e.g., cooling towers, filtration, free cooling)	B.9 Optimize pump performance
B.14 Optimize operating set points	B.15 Develop key performance indicators (e.g., reset schedule, KW/sq. ft., peak load)	B.16 Conduct regular building performance meetings		
C.5 Perform Energy Star® review	C.6 Perform green building certification review	C.7 Review building occupancy plan	C.8 Quantify greenhouse gas emissions	C.9 Perform waste audit (e.g., hazardous, landfill, recycling)
C.14 Review building occupant survey results	C.15 Review system alarm history	C.16 Test combustion equipment efficiencies	C.17 Perform water treatment audit	C.18 Determine need for energy consultant
D.5 Develop energy plan	D.6 Determine load shedding opportunities	D.7 Develop zero waste plan	D.8 Optimize SOPs	D.9 Update maintenance & repair plan
D.14 Develop building occupancy policy	D.15 Identify alternative energy opportunities	D.16 Develop zero net energy plan	D.17 Develop control system plan (e.g., enhanced data points, trends, data analysis)	D.18 Develop system integration plan
D.23 Develop proposals for management				

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DUTIES	TASKS			
<b>E. Implement Continuous Improvement</b>	E.1 Present facility improvement plan to management	E.2 Manage vendor contracts (e.g., RFP, proposals, awards)	E.3 Review engineering budget (e.g., operating, capital)	E.4 Perform routine inspections (e.g., equipment, systems, controls)
	E.10 Implement zero net energy plan	E.11 Implement system integration plan	E.12 Optimize control system (e.g., enhance data points, trends, data analysis)	E.13 Implement predictive maintenance plan
<b>F. Manage Building Systems</b>	F.1 Track utility costs & consumption	F.2 Evaluate energy savings	F.3 Track equipment performance	F.4 Track service calls
<b>G. Perform Administrative Tasks</b>	G.1 Review test equipment and tools	G.2 Manage operating budget	G.3 Prepare monthly reports for management (e.g., energy, labor, activity)	G.4 Manage building energy efficiency standards
	G.10 Assess vendor's high performance qualifications			
<b>H. Participate in Professional Development Activities</b>	H.1 Develop staff succession plan	H.2 Conduct staff evaluations	H.3 Conduct high performance job training	H.4 Facilitate problem solving meetings
	H.10 Participate in conferences and trade shows	H.11 Participate in code update training (e.g., energy efficiency, building codes, local ordinances)	H.12 Share best practices (e.g., peer-to-peer, online, conferences)	H.13 Obtain professional certifications (e.g., CXA, LEED, BOC)

E.5 Implement high performance energy plan	E.6 Implement load shedding measures	E.7 Implement zero waste plan	E.8 Implement commissioning plan	E.9 Adjust equipment settings per occupancy plan
E.14 Review measurement & verification plan				
F.5 Determine need for systems balance	F.6 Track maintenance and repairs	F.7 Track predictive maintenance	F.8 Review measurement & verification reports	F.9 Monitor staff performance (e.g., service calls, preventive maintenance, rounds)
G.5 Research new technology	G.6 Establish staff performance goals	G.7 Develop green procurement policy	G.8 Facilitate energy efficiency meetings (e.g., staff, management, vendors)	G.9 Develop staff training program
H.5 Identify staff professional development activities	H.6 Develop vendor shadowing program	H.7 Develop staff training on new equipment technologies	H.8 Create employee engagement programs	H.9 Participate in professional organizations
H.14 Participate in continuing education classes				

## General Knowledge and Skills

### Knowledge:

Root cause analysis  
Basic algebra  
Basic geometry  
Fluid dynamics  
Thermodynamics  
Mechanical systems  
Lighting systems  
Building construction  
Systems thinking  
HVAC cycle  
DDC controls  
Basic finance  
Real estate finance  
Insurance & liability  
Codes and standards  
Air & water balance  
Psychrometrics  
Plumbing systems  
Electrical systems  
Design intent  
Building loads  
Building science  
Engineering ethics  
Sustainability principles  
Environmental impact  
Available certifications

### **Acronyms**

VFD	Variable Frequency Drive
PPE	Personal Protective Equipment
LED	Light Emitting Diode
RFP	Request for Proposal
SOP	Standard Operating Procedure
BMS	Building Management System
PM	Preventive Maintenance
MEP	Mechanical Electrical Plumbing
IEQ	Indoor Environmental Quality
BAS	Building Automation System
DDC	Direct Digital Controls
CXA	Certified Commissioning Authority
LEED	Leadership in Energy & Environmental Design
BOC	Building Operator Certification

### Skills:

Communication  
Tool operation  
Report writing  
Blueprint reading  
System diagrams  
Single line diagrams  
Flow charting  
Troubleshooting  
Analytical  
Leadership  
Negotiation  
Prioritizing  
Selling  
Presentation  
Conflict resolution  
Mentoring  
Managerial  
Problem solving

### **Behaviors**

Team player  
Accountable  
Confident  
Multitasker  
Analytical  
Persistent  
Punctual  
Trainable  
Passionate  
Open minded  
Physically fit  
Innovative  
Knowledgeable  
Able to follow directions  
Inquisitive  
Precise  
Safety oriented  
Mechanically inclined  
Self starter  
Forward thinking  
Solution driven

## Tools, Equipment, Supplies and Materials

Light meter  
pH meter  
Tachometer  
Computer  
Calculator  
Basic hand tools  
Digital camera  
Infrared camera  
PPE  
Ladders  
Basic office supplies  
Megger  
Multimeter  
Cell phone  
Internet/Intranet  
Flash drives  
Flashlights  
Carbon dioxide meter  
Anemometer  
Manometer  
Power meter  
Temperature meter  
Flow hood  
Oxygen sensor  
Data logger  
Combustion analyzer  
Building automation system  
Lockout/tagout tags  
Man lifts  
Particulate counter  
Water quality testing equipment  
Software:  
\* HOBO  
\* Universal Translator  
\* Microsoft Office  
\* Microsoft Project  
\* DOE programs  
\* Visio  
\* Energy Plus  
Network access to:  
\* BAS  
\* Tenant interface  
\* PM program  
\* Work order program  
\* Energy dashboard  
\* Google Docs  
\* File sharing  
Vibration analysis  
Ultrasonic microphone  
Ultrasonic meter

## Future Trends and Concerns

Trend toward:  
\* zero net energy  
\* zero waste  
\* on site energy generation  
\* use of direct digital controls  
\* carbon footprint reduction  
\* lighting controls  
\* big data/Internet of things  
\* building certifications  
\* variable refrigerant flow  
\* water conservation  
\* increased occupancy density  
\* consolidating data centers  
\* sub metering  
\* electric vehicle charging stations  
\* onsite energy shortage  
\* micro grids  
\* utility demand response  
\* smart meters  
\* wireless systems  
\* carbon dioxide monitoring  
\* electronic data gathering  
\* integration of systems  
Proliferation of data centers  
Cloud data storage  
Workforce shortages  
LED lighting