



## **STEVEN T. TAYLOR, P.E.**

### **PRINCIPAL**

Steve Taylor has 40 years of commercial and institutional HVAC system design experience, the last 12 with design/build contractors before starting Taylor Engineering in 1995.

Mr. Taylor is a Fellow of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) and one of very few to have received all of ASHRAE's top awards for technical achievement. From 1983 to 1997 and 2010 to present, he was/is a member of the committee responsible for ASHRAE Standard 90.1 "Energy Conservation in New Non-Residential Buildings," a standard that is the basis of energy conservation codes throughout the country. He chaired the Standard 90.1 HVAC Systems and Equipment subcommittee and was the principal author of the HVAC sections of Standard 90.1-1989 and 90.1-1999. Mr. Taylor served in a similar role with the California Energy Commission's Professional Advisory Group and was a principal author of the HVAC and Ventilation sections of California's current Title 24 Energy Standards.

Mr. Taylor is a past chair and eight-year member of the committee responsible for ASHRAE Standard 62 "Ventilation for Acceptable Indoor Air Quality," the basis of most State building codes. He is the past vice chair and five-year member of the Indoor Environmental Quality Technical Advisor Group developing IEQ requirements for the USGBC LEED Green Building Rating System.

Mr. Taylor is a nationally known building automation system expert. He is the author of an ASHRAE sponsored textbook on the Fundamentals of HVAC Control Systems and served as chair of ASHRAE's Control Theory & Application Technical Committee 1.4 and ASHRAE's Guideline Committee 13 Specifying Building Automation Systems. Recently he founded and is a member of ASHRAE's Guideline 36 High Performance Sequences of Operation for HVAC Systems.

Mr. Taylor has authored over 40 peer-reviewed ASHRAE Journal articles and technical papers and co-writes the monthly ASHRAE Journal Engineer's Notebook column.

With his unique combination of HVAC system design, control system design, energy conservation, indoor air quality, and commissioning expertise along with his practical, hands-on design/build experience, Mr. Taylor brings a unique perspective to any HVAC system project.

### **EDUCATION**

M.S. Mechanical Engineering,  
Stanford University, 1977  
B.S. Physics,  
Stanford University, 1976

### **REGISTRATIONS**

Mechanical Engineer,  
California, M-020819  
Georgia, 19452

### **AFFILIATIONS**

American Society of Heating,  
Refrigeration, and Air-  
Conditioning Engineers  
United States Green Building  
Council  
International Association of  
Plumbing and Mechanical  
Officials (IAPMO)  
CSU Mechanical Review  
Board

### **YEARS OF EXPERIENCE**

41 years total  
23 years with Taylor



## TEACHING EXPERIENCE

1989 – present University of California Extension, Berkeley, CA  
Instructor for “HVAC Air Distribution & Hydronic Systems Design”  
Instructor for “HVAC Control and Energy Management Systems”

## PROFESSIONAL ASSOCIATIONS

### American Society of Heating, Refrigerating, and Air- Conditioning Engineers (ASHRAE):

Associate member 1979 – 1989; member 1989 – 2003; Fellow 2003  
Standing Standards Project Committee 90.1 Energy Conservation; member 1983 – 1997; 2010 to present. Chairman HVAC Systems and Equipment Subcommittee, 1983 – 1991.  
Principal author of HVAC section to Standard 90.1-1989 and 1999, and all Users Manuals  
Standing Standards Project Committee 62.1 Ventilation for Acceptable Indoor Air Quality; member 1991 – 1999; chair 1995 – 1999. Coauthor of 62.1 User’s Manual  
Standing Standards Project Committee 55 Thermal Environmental Conditions for Human Occupancy; member 2003 – 2006  
Guideline 13, Specifying Building Automation Systems; chair 2003 – 2008  
Guideline 16, Selecting Outdoor, Return, and Relief Dampers for Air-Side Economizer Systems; chair 1999 – 2003  
Guideline 36, High Performance Sequences of Operation for HVAC Systems; member 2016 to present  
Golden Gate Chapter Code Committee; member 1988 – 1991, 1999 – 2005; chair 1989  
Golden Gate Chapter Board of Governors; member 1988 – 1991; treasurer 1989 – 1991  
Technical Committee 4.3 Ventilation Requirements and Infiltration; member 1996 – present, vice-chair 2001 – 2003; chair 2012 – 2016  
Technical Committee 1.4 Control Theory & Application; member 2000 – present; vice-chair 2006 – 2008; chair 2008 – 2010  
Research Advisory Panel; 2007 – 2010  
ASHRAE Distinguished Service Award, 2008  
ASHRAE Research Service Award, 2010  
ASHRAE Standards Achievement Award, 2012  
ASHRAE Exceptional Service Award, 2012  
ASHRAE Louise and Bill Holladay Award, 2016  
ASHRAE Andrew T. Boggs Award, 2017  
ASHRAE F. Paul Anderson Award (ASHRAE’s highest honor), 2018  
Code Interaction Subcommittee and Code Development Committee; 1999 – 2002, CDC chair 2005  
Standards Committee; 1999 – 2003  
ASHRAE Distinguished Lecturer; 1998 – 2003  
ASHRAE liaison to California Energy Commission Professional Advisory Group, 1983 – 1991

### International Association of Plumbing and Mechanical Officials (IAPMO):

Mechanical Technical Committee, member and ASHRAE liaison 2000 – 2016



United States Green Building Council (USGBC):

Indoor Environmental Quality Technical Advisor Group, LEED Green Building Rating System, member 2003 – 2009, vice chair 2004 – 2009

California State University (CSU)

Mechanical Review Board, member 2004 – present

## PUBLICATIONS

*4-Pipe VAV vs. Active Chilled Beams for Labs*, ASHRAE Journal, December 2018

*Making VAV Great Again*, ASHRAE Journal, August 2018

*A New Design Approach to Museum HVAC Design*, co-authored with David Heinzerling, ASHRAE Journal, August 2018

*Designing Mega-AHUs*, ASHRAE Journal, April 2018

*Doubling Down on Not Balancing Variable Flow Hydronic Systems*, ASHRAE Journal, December 2017

*Changeover Controls & Coils*, ASHRAE Journal, August 2017

*Automatic Fault Detection and Hierarchical Fault Suppression in RP-1455*, co-authored with Reece Kiriou, ASHRAE Transactions, June 2017

*BAS Control of VAV Labs*, ASHRAE Journal, April 2017

Fundamentals of Design and Control of Central Chilled-Water Plants, textbook for ASHRAE Self-Directed Learning course, 2017

*The Fundamentals of Expansion Tanks*, ASHRAE Journal, November 2016

*"Sweep" Parking Garage Exhaust Systems*, ASHRAE Journal, July 2016

*Making UFAD Systems Work*, ASHRAE Journal, March 2016

*Resetting Setpoints Using Trim & Respond Logic*, ASHRAE Journal, November 2015

*VAV Box Duct Design*, ASHRAE Journal, July 2015

*Return Air Systems*, ASHRAE Journal, March 2015

*Control Sequences & Controller Programming*, co-authored with Mark Hydeman & Brent Eubanks, ASHRAE Journal, March 2015

*Select & Control Economizer Dampers in VAV Systems*, ASHRAE Journal, November 2014

*Return Fans in VAV Systems*, ASHRAE Journal, October 2014

*How to Design & Control Waterside Economizers*, ASHRAE Journal, June 2014

*Restroom Exhaust Systems*, ASHRAE Journal, February 2014

*Tips to Reduce Chilled Water Plant Costs*, ASHRAE Journal, October 2013

*VAV Reheat Versus Active Chilled Beams & DOAS*, co-authored with Jeff Stein, ASHRAE Journal, May 2013

*Dual Maximum VAV Box Control Logic*, ASHRAE Journal, December 2012

*Optimizing Design & Control of Chilled Water Plants, Part 5 Optimized Control Sequences*, ASHRAE Journal, June 2012

*Optimizing Design & Control of Chilled Water Plants, Part 4 Chiller & Cooling Tower Selection*, ASHRAE Journal, March 2012

*Optimizing Design & Control of Chilled Water Plants, Part 3 Pipe Sizing and Optimizing  $\Delta T$* , ASHRAE Journal, December 2011



- Optimizing Design & Control of Chilled Water Plants, Part 2 Condenser Water System Design*, ASHRAE Journal, September 2011
- Optimizing Design & Control of Chilled Water Plants, Part 1 Chilled Water Distribution System Selection*, ASHRAE Journal, July 2011
- Economizer High Limit Controls and Why Enthalpy Economizers Don't Work*, ASHRAE Journal, December 2010 (Winner: Best Journal Article Award, 2010)
- Sizing Pipe using Life Cycle Costs*, ASHRAE Journal, October 2008
- VAV System Static Pressure Setpoint Reset*, ASHRAE Journal, June 2007
- Chilled Water Plant Retrofit – A Case Study*, ASHRAE Transactions, June 2006
- CO<sub>2</sub>-Based Demand Controlled Ventilation using Standard 62.1-2004*, ASHRAE Journal, May 2006
- LEED and Standard 62.1*, ASHRAE Journal, September 2005
- Sizing VAV Boxes*, ASHRAE Journal, March 2004
- Understanding Expansion Tanks*, ASHRAE Journal, March 2003
- Balancing Variable Flow Hydronic Systems*, ASHRAE Journal, October 2002
- Primary-Only vs. Primary-Secondary Variable Flow Systems*, ASHRAE Journal, February 2002
- Degrading Chilled Water Plant  $\Delta T$ : Causes and Mitigation*, ASHRAE Transaction, 2002 (Winner: Best Symposium Paper Award, 2002)
- Advanced Variable Air Volume System Design Guide, co-authored with Mark Hydeman and Jeff Stein, California Energy Commission publication number P500-03-082-A-11, October 2003.
- Comparing Economizer Relief Systems*, ASHRAE Journal, September 2000
- CoolTools™ Chilled Water Plant Design Guide, co-authored with Mark Hydeman, Paul DuPont and Tom Hartman, Energy Design Resources, November 1999
- Series Fan-powered Boxes: Their Impact on Indoor Air Quality and Comfort*, ASHRAE Journal, July 1996 (Winner: Best Journal Article Award, 1996)
- Acceptable Indoor Air Quality: The role of ventilation and determining ventilation rates*, proceedings of Frigair'96 (South Africa), March 1996
- Determining Ventilation Rates: Revisions to Standard 62*, ASHRAE Journal, February 1996
- Fundamentals of HVAC Controls, textbook for ASHRAE, 1996
- Standard 90.1 User's Manual, HVAC sections, ASHRAE, 1993, 1999, 2001
- Standard 62.1 User's Manual, Ventilation sections, ASHRAE, 2004, 2007, 2010
- HVAC Systems: Central versus Floor-by-Floor*, co-author with Robert G. Linford, Ph.D., Heating Piping & Air Conditioning magazine, July 1989
- ASHRAE Standard 90.1, HVAC Systems and Equipment*, ASHRAE Journal, February 1989

## REPRESENTATIVE PROJECTS

275 Brannan Street	San Francisco, CA, 50,000 ft <sup>2</sup> , LEED Gold
350 Bush Street	San Francisco, CA, 350,000 ft <sup>2</sup> , LEED Silver
475 Sansome Street	San Francisco, CA, 400,000 ft <sup>2</sup>
505 Brannan Street	San Francisco, CA, 300,000 ft <sup>2</sup> , LEED Platinum
505 Montgomery Street	San Francisco, CA, 300,000 ft <sup>2</sup>
55 Stockton Street	San Francisco, CA, 150,000 ft <sup>2</sup>
1100 Broadway	Oakland, CA, 300,000 ft <sup>2</sup> , LEED Gold



Alameda County Juvenile Facility	San Leandro, CA, 380,000 ft <sup>2</sup> , LEED Gold
Atlanta City Detention Center	Atlanta, GA, 470,000 ft <sup>2</sup>
Barclays Global Investment HQ	San Francisco, CA, 285,000 ft <sup>2</sup>
Bay Meadows Mixed Use Development	San Mateo, CA, 300,000 ft <sup>2</sup>
California Plaza	Walnut Creek, CA, 300,000 ft <sup>2</sup>
Capitol Area East End Complex	Sacramento, CA, 330,000 ft <sup>2</sup> , LEED Platinum
Castro Valley Library	Castro Valley, CA, 33,000 ft <sup>2</sup> , LEED Silver
Cathedral of Christ the Light	Oakland, CA, 220,000 ft <sup>2</sup>
Dolby HQ 1275 Market	San Francisco, CA, 310,000 ft <sup>2</sup> , LEED Gold
Dryers Grande Ice Cream HQ Bldg.	Oakland, CA, 60,000 ft <sup>2</sup>
Electronic Arts Phase II	Redwood City, CA, 330,000 ft <sup>2</sup>
Fairmont Hotel Remodel	San Francisco, CA, 600,000 ft <sup>2</sup>
Fairmont Hotel	San Jose, CA, 620 rooms
Fort Gordon Corps of Engineers	Fort Gordon, GA, 1,600,000 ft <sup>2</sup>
Helios Project	Berkeley, CA, 144,000 ft <sup>2</sup>
IBM Chiller Plant	San Jose, CA, 17,000 tons
Jack London Square Office Building	Oakland, CA, 180,000 ft <sup>2</sup> , LEED Certified
Jackson Rancheria Casino	Jackson, CA, 300,000 ft <sup>2</sup>
Juniper Networks IIA	Sunnyvale, CA, 310,000 ft <sup>2</sup> , LEED Gold
Lake Pointe Building 2	Charlotte, NC, 150,000 ft <sup>2</sup>
LLNL Terascale Facility	Livermore, CA, 230,000 ft <sup>2</sup>
nVIDIA Endeavor Building	Santa Clara, CA, 500,000 ft <sup>2</sup> , LEED Gold
nVIDIA Endeavor Phase II Building	Santa Clara, CA, 750,000 ft <sup>2</sup> , LEED Gold
Novato Administration Building	Novato, CA, 30,000 ft <sup>2</sup> , LEED Gold (equiv.)
Oceanwide Towers	San Francisco, CA, 2,100,000 ft <sup>2</sup> , LEED Platinum
Oracle Pleasanton Building 2	Pleasanton, CA, 180,000 ft <sup>2</sup> , LEED Silver
Palo Alto Medical Foundation Campus	Palo Alto, CA, 300,000 ft <sup>2</sup>
Pixar Phase II	Emeryville, CA, 110,000 ft <sup>2</sup>
Raychem HQ Office Building	Menlo Park, CA, 60,000 ft <sup>2</sup>
Ridgehaven "Green" Building	San Diego, CA, 73,000 ft <sup>2</sup>
Sacred Heart Preparatory Theater	Atherton, CA, 21,000 ft <sup>2</sup>
Santa Clara Valley Medical Center RSC	San Jose, CA, 110,000 ft <sup>2</sup> , LEED Silver
San Francisco Market Square	San Francisco, CA, 1,066,000 ft <sup>2</sup> , LEED Gold
San Francisco Museum of Modern Art	San Francisco, CA, 335,000 ft <sup>2</sup> , LEED Gold
St. Francis Medical Center	San Francisco, CA, 65,000 ft <sup>2</sup>
Sutter Square	Concord, CA, 200,000 ft <sup>2</sup>
Symantec Headquarters	Culver City, CA, 550,000 ft <sup>2</sup> , LEED Gold
The Gap HQ (250 Embarcadero)	San Francisco, CA, 540,000 ft <sup>2</sup>
UCSD Medical Education Center	San Diego, CA, 78,000 ft <sup>2</sup> , LEED Silver
UC Merced, Classroom/office	Merced, CA, 90,000 ft <sup>2</sup> , LEED Gold
UC Merced EMCS	Merced, CA, campus-wide
US Census Bureau HQ EMCS	Suitland, MD, 1,500,000 ft <sup>2</sup>
Vista (Berkeley Community) College	Berkeley, CA, 160,000 ft <sup>2</sup> , LEED Silver
Workday Development Center	Pleasanton, CA, 420,000 ft <sup>2</sup> , LEED Gold