



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

Steven Taylor is a registered mechanical engineer with a BS in Physics and an MS in Mechanical Engineering from Stanford University. He has over 30 years of commercial and institutional HVAC system design experience, the last 12 with design/build contractors until starting Taylor Engineering in 1995, a consulting firm specializing in energy efficient HVAC system design.

Mr. Taylor is a Fellow of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE). From 1983 to 1997, he was 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 in every state in 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 and on the team updating the Standards for 2005, 2008, and 2011.

Mr. Taylor is a past chair and eight year member of the committee developing ASHRAE Standard 62 "Ventilation for Acceptable Indoor Air Quality," widely considered the "bible" of IAQ and the basis of most state building codes. He served on the Certified Indoor Air Quality Professional Board for the Association of Energy Engineers, helping to develop a certification program for indoor air quality specialists. Mr. Taylor has spoken on IAQ and Standard 62 around the U.S. and in two foreign countries and was listed as No. 1 of the "Indoor Environment Power 50," Indoor Environment Review's 1997 list of the top 50 people in the indoor air quality field. He is the immediate 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 considered an authority on the design of energy efficient HVAC systems and building system simulation. Among his design projects are LEED certified office buildings and PG&E's ACT<sup>2</sup> ultra high efficiency demonstration projects. He has frequently lectured and written several papers on the subject and was one of the principal authors of a design guides for Energy Efficient Chilled Water Plants and Variable Air Volume Systems for PG&E.

Mr. Taylor is also an experienced control system designer. In addition to designing and programming the digital control systems for the large HVAC projects he designed and installed, Mr. Taylor has designed controls for large campuses such as the University of California at Merced, San Francisco State University, Sonoma State University, and the US Census Bureau Headquarters. He is the author of an ASHRAE sponsored manual on the Fundamentals of HVAC Control Systems, is chair of ASHRAE's Control Theory & Application Technical Committee 1.4, and is immediate past chair of ASHRAE's Guideline 13 Specifying Direct Digital Control Systems.

Most recently, Mr. Taylor has developed expertise in HVAC and control system commissioning. Among the projects for which he served as commissioning agent include ASHRAE's own headquarters building in Atlanta, the Ridgehaven Green Building project, a 16000 ton chiller plant in San Jose, and the UC Merced campus.

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.



# Taylor Engineering<sup>LLC</sup>

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

### Education

1976 - 1977 Stanford University, M.S. Mechanical Engineering  
1972 - 1976 Stanford University, B.S. Physics

### Registration

1982 – present State of California: Mechanical Engineer M-020819  
1991 – 1994 State of Georgia: Mechanical Engineer 19452

### Experience

1995 – present Taylor Engineering, Alameda, CA  
Principal. HVAC system and control system design; indoor air quality analysis; HVAC system commissioning; energy conservation and computerized energy analysis; energy and indoor air quality standards and codes.

1994 – 1995 Linford Co., Oakland, CA  
Director of Marketing

1991 – 1994 McKenney's, Inc., Atlanta, GA  
Chief Engineer Design/Build Department. Created department and led company's commercial, industrial, and institutional design/build effort.

1984 – 1991 Linford Co., Oakland CA  
Senior Design/Build Project Engineer/Manager. Responsible for sales and marketing of Design/Build projects. Designer and construction manager of HVAC and control systems for over a million square feet of commercial offices, retail stores, and hotels.

1981 – 1984 Charles & Braun, Consulting Engineers, San Francisco, CA  
Vice-president HVAC Design and Computer Services

1979 – 1981 Donald Bentley and Associates, Consulting Engineers, San Francisco, CA  
Director of Computer Services

1977 – 1979 Westinghouse Electric Corporation, Pittsburgh, PA  
Advanced Systems Technology Group Analytical Engineer/Programmer. Developed engineering software for the Commercial and Industrial Air Conditioning Division.

### Teaching Experience

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



## 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. Chairman HVAC Systems and Equipment Subcommittee, 1983 – 1991. Principal author of HVAC section to Standard 90.1-1989, Standard 90.1-1999, and 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 Direct Digital Control Systems; chair 2003 – present  
Guideline 16, Selecting Outdoor, Return, and Relief Dampers for Air-Side Economizer Systems; chair 1999 – 2003  
Golden Gate Chapter Energy Committee, member 1982 – 1983; chair 1984 – 1988  
Golden Gate Chapter Code Committee; member 1988 – 1991, 1999 – present; chair 1989  
Golden Gate Chapter Board of Governors; member 1988 – 1991; treasurer 1989 – 1991  
Technical Committee 4.3 Ventilation Requirements and Infiltration; corresponding member 1996 – 1998; voting member 1998 – present, vice-chair 2001 – 2003  
Technical Committee 1.4 Control Theory & Application; member 2000 – present; vice-chair 2006 – 2008; chair 2008 – present  
Research Advisory Panel; 2007 – present  
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 – present

### 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

*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, 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  
*Standard 62.1 User's Manual*, VRP sections, ASHRAE, 2005, 2007  
*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)  
*Comparing Economizer Relief Systems*, ASHRAE Journal, September 2000  
*Energy Efficient Chilled Water Plant Design & Performance Specification Guide*, PG&E, 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

DOE-2.1 California Compliance Supplement, co-author with Eley Associates, California Energy Commission, December 1990

*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**

475 Sansome Street	San Francisco, CA, 400,000 ft <sup>2</sup>
505 Montgomery Street	San Francisco, CA, 300,000 ft <sup>2</sup>
55 Stockton Street	San Francisco, CA, 150,000 ft <sup>2</sup>
601 California Street	Palo Alto, CA, 100,000 ft <sup>2</sup>
Alameda County Juvenile Facility	San Leandro, CA, 380,000 ft <sup>2</sup> , LEED NC 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 NC Gold
Castro Valley Library	Castro Valley, CA, 33,000 ft <sup>2</sup> , LEED NC Silver
Cathedral of Christ the Light	Oakland, CA, 220,000 ft <sup>2</sup>
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>
IBM Chiller Plant	San Jose, CA, 17,000 tons
Jack London Square	Oakland, CA, 180,000 ft <sup>2</sup> , LEED certified
Lake Pointe Building 2	Charlotte, NC, 150,000 ft <sup>2</sup>
Lanier Worldwide Offices	Atlanta, GA, 80,000 ft <sup>2</sup>
LLNL Terascale Facility	Livermore, CA, 230,000 ft <sup>2</sup>
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>
PG&E ACT <sup>2</sup>	Vallejo, CA, 25,000 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>
St. Francis Medical Center	San Francisco, CA, 65,000 ft <sup>2</sup>
Sutter Square	Concord, CA, 200,000 ft <sup>2</sup>
Symantec Culver City	Culver City, CA, 550,000 ft <sup>2</sup> , LEED NC Gold
The Gap HQ (250 Embarcadero)	San Francisco, CA, 540,000 ft <sup>2</sup>
The Towers on Capitol Mall	Sacramento, CA, 1,700,000 ft <sup>2</sup>
UCSD Medical Education Center	San Diego, CA, 78,000 ft <sup>2</sup>
UC Merced, Classroom/office	Merced, CA, 90,000 ft <sup>2</sup> , LEED NC Gold
UC Merced EMCS	Merced, CA, campus-wide
US Census Bureau HQ EMCS	Suitland, MD, 1,500,000 ft <sup>2</sup>
USF Law Library	San Francisco, CA, 60,000 ft <sup>2</sup>
Vista (Berkeley Community) College	Berkeley, CA, 160,000 ft <sup>2</sup> , LEED NC Silver