Appendix

F.1 Acronym List

above finished floor (AFF)
acquired immune deficiency syndrome (AIDS)
air-handling unit (AHU)
Air Moving and Conditioning Association (AMCA)
alternating current (AC)
Ambulatory Care Research Facility (ACRF)
ampere interrupting capacity (AIC)
American Association for the Accreditation of Laboratory Animal Care (AAALAC)
American Association of State Highway and Transportation Officials (AASHTO)
American Hospital Association (AHA)
American Institute of Architects (AIA)
American National Standards Institute (ANSI)
American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
American Society of Mechanical Engineers (ASME)
American Society of Plumbing Engineers (ASPE)
American Society for Testing and Materials (ASTM)
American Water Works Association (AWWA)
American Welding Society (AWS)
animal-holding area (AHA)
animal-watering system (AWS)
Architect/Engineer (A/E)
Associated Air Balance Council (AABC)
Association of Edison Illuminating Companies (AEIC)
automatic temperature control (ATC)
automatic transfer switch (ATS)
average water gauge (AWG)

backflow prevention (BFP)
biological safety cabinet (BSC)
biosafety level (BL)
Building and Facilities (B&F)
Building Officials and Code Administrators, International (BOCA)
capital recovery factor (CRF)
carbon dioxide($CO_{2)}$
Centers for Disease Control and Prevention (CDC)
Certified Ballast Manufacturers (CBM)
Clinical Center Complex (CCC)
cold water (CW)
color rendering index (CRI)
common accounting number (CAN)
compressed gas (CG)
Compressed Gas Association (CGA)
computer-aided design and drafting (CADD)
concrete mansonry unit (CMU)
constant air volume (CAV)
construction quality management (CQM)
control power transformer (CPT)

dedicated ground riser (DGR)
dental treatment room (DTR)
deoxyribonucleic acid (DNA)
Department of Energy (DOE)
diagnostic and treatment (D&T)
diameter index safety system (DISS)
direct current (DC)
distribution duct system (DDS)
distributive digital control (DDC)
drain, waste, and vent (DWV)
dynamic insertion loss (DIL)

electrical metal conduit (EMC)
electrical metal tubing (EMT)
electromagnetic interference (EI)
electronic data processing (EDP)
Electronic Industries Association (EA)
Electronic Testing Laboratory (ETL)
equivalent linear measurement [of laboratory work space] (ELM)
ethylene oxide [sterilizer] (EtO)
ethylene propylene rubber (EPR)
exhaust fan (EF)
external manual operator (EMO)

Federal Communications Commission (FCC)
full-time employee (FTE)

General Services Administration (GSA)
grand fault interrupting (GFI)

halogen infrared (HIR)
hand-off-auto (HOA)
heating, ventilation, and air-conditioning (HVAC)
high-efficiency particulate air (HEPA)
hot water (HW)
hot water recirculating (HWR)

Illuminating Engineering Society of North America (IESNA)
indoor air quality (IAQ)
Inter Building Closet (IBC)
Institute of Electrical and Electronics Engineers (IEEE)
intensive care unit (ICU)
InterNational Electrical Testing Association (NETA)
International Electrotechnical Commission (IEC)

Joint Commission on the Accreditation of Healthcare Organizations (JCAHO)

laboratory air (LA)
laboratory vacuum (LV)
Lighting Protection Institute (LPI)
limit switch (LS)
local area network (LAN)

magnetic resonance imaging (MRI)
main circuit breaker (MCB)
main lugs only (MLO)
Maryland Department of Environment (MDE)
mass spectrometry (MS)
mechanical/electrical/plumbing (MEP)
medical air (MA)
medical gas (MG)
medical, surgical, and nursing (MS&N)
medical vacuum (MV)
Memorandum of Understanding (MOU)
mental health patient care unit (MHPCU)
metal oxide varistor (MOV)
metal halide (MH)
modular building controller (MBC)
motor control center (MCC)

National Electrical Code (NEC)
National Electrical Manufacturers Association (NEMA)
National Electrical Safety Code (NESC)
National Fire Codes (NFC)
National Fire Protection Association (NFPA)
National Institute of Occupational Safety and Health (NIOSH)
National Institutes of Health(NIH)
National Institute of Standards and Technology (NIST)
nitrous oxide (NO)
noise criteria (NC)
noise reduction coefficient (NRC)
nuclear magnetic resonance (NMR)

Occupational Safety and Health Act (OSHA)
Occupational Safety and Health Administration (OSHA)

paper-insulated, lead-covered (PILC)
patient care unit (PCU)
pediatric patient care unit (PPCU)
perceived air quality (PAQ)
personal computer (PC)
polytetra fluoroethylene (PTFE)
polyvinyl chloride (PVC)
positron emission tomography (PET)
post anestesia recovery (PAR)
Potomac Electric Power Company (PEPCO)
power factor (PF)
pressure-reducing valve (PRV)
Program of Requirements (POR)
programmable lighting control (PLC)
Public Health Service (PHS)
pulse-width modulation (PWM)

radio frequency interference (RFI)
ratio (R-value) (R)
relative humidity (RH)
remote terminal unit (RTU)
reverse osmosis (RO)
rigid galvanized steel (RGS)
room cavity ratio (RCR)
room criteria (RC)

Scientific Apparatus Makers Association (SAMA)
service entrance (SE)
Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
silicone-controlled rectifiers (SCR)
smoke (SM)
sound transmission class (STC)
stand-alone control unit (SCU)
standard dimension ration (SDR)

Telecommunications Industries Association (TIA)
terminal equipment controller (TEC)
testing and balancing (T & B)
thermal manual motor starter (TMMS)
total harmonic distortion (THD)
transient voltage surge suppression (TVSS)

Underwriters Laboratories (UL)
Uniform Federal Accessibility Standards (UFAS)
uniform present worth (UPW)
uninterruptible power supply (UPS)
unit directional flow (UDF)
unshielded twisted pair (UTP)

variable air volume (VAV)
variable-frequency speed drive (VFD)
variable-speed drive (VSD)
ventilation rate (VR)
vinyl composition tile (VCT)
volatile organic compound (VOC)
voltage-source inventer (VSI)

Washington Suburban Sanitary Commission (WSSC)
World Health Organization (WHO)

F.2 Units of Measure

A	ampere
cd	candela
cph	changes per hour
dB	decibels
°C	degrees Celsius
°K	degrees Kelvin
g	gram
Hz	hertz
kg	kilogram
kJ	kilojoule
kPa	kilopascal
kV	kilovolt
kVA	kilovoltampere
kW	kilowatt
kWh	kilowatt hour
L	liters
L/s	liters per second
LPM	liters per minute
LPW	lumens per watt
lx	lux
m	meter
m^2	square meter
mA	milliampere
MCM	thousand circular mils
mil	millimeter
MJ	megajoule
mL	milliliter
mm	millimeter
mmHg	millimeters of mercury
mRem	millirem
m/s	meters per second
nm^2	net square meter
Pa	pascal
%	percent
ppm	parts per million
rpm	revolutions per minute
s	second
V	volt
VA	voltampere
W	watt

F.3 Committees, Contributors, Founders

The following list of Ad Hoc committees met over a period of eight months in order to formulate, edit, and format this document. We thank them for their efforts and their continuing service to the National Institutes of Health.

F.3.1 Architectural - Ad Hoc Committee

Name

Charles E. Blumberg, FIIDA

Ricardo C. Herring, AIA

Herbert B. Jacobi

J.P. Khoshbin, RA

Frank M. Kutlak, RA

Kristy Long, RA

Rand M. Mortimer

Judith A. Quasney

Solange Rangel, RA

Donald A. Sebastian, RA

Gary Zackowitz, RA

Nonvoting

Rassa Davoodpour

Cyrena G. Simons

Dr. James F. Taylor

Dr. Alan L. Chedester

Dan Cushing AIA

Christopher Cowansage

Cory English

Barbara Myerchin

F.3.2 Structural - Ad Hoc Committee

Name

Athanasia Mantzouranis, PE

John Pavlides, PE

Shahriar Saleh, PE

Nonvoting

Rassa Davoodpour

Frank M. Kutlak, R.A.

Frank Lancaster

F.3.3 Mechanical - Ad Hoc Committee

Name

Joseph M. Bladen

Ben Buck

Byung Kim

James S. Lewis, PE

Johnny Madlangbayan

Dr. Farhad Memarzadeh

Rand M. Mortimer

Peter W. Sweeney

E. Torkashvan

Non Voting

Rassa Davoodpour

Frank M. Kutlak, RA

Duane S. Pinnix, PE

F.3.4 Electrical - Ad Hoc Committee

Name

David H. Epley, PE

John K. Hollingsworth

Thomas Ligis

Phillip Marcus

Leon F. Pheder, PE

William Strine

Nonvoting

Rassa Davoodpour

Frank M. Kutlak, RA

Wesson H. Miller, Jr., PE

F.3.5 Plumbing - Ad Hoc Committee

Name

Dave Berry

Joseph M. Bladen

Ben Buck

Frank R. Kelly

Byung Kim

Johnny Madlangbayan

Peter W. Sweeney

E. Torkashvan

Nonvoting

Rassa Davoodpour

Frank M. Kutlak, RA

Duane S. Pinnix, PE

F.3.6 Fire Protection - Ad Hoc Committee

Name

Christine M. Campbell

David H. Epley, PE

Louis Kepitch

Thomas Ligis

J. P. McCabe, PE

Albert Parrish

William Strine

Nonvoting

Rassa Davoodpour

Frank M. Kutlak, RA

Joseph G. Dafin, PE

Albert P. Free, PE, CSP

Jeffrey M. Bauer, PE,
CIH, CSP

F.3.7 Controls - Ad Hoc Committee

Name

Joseph M. Bladen

Martin D. Borenstein, PE

Ben Buck, PE

John Madlangbayan

Dr. Farhad Memarzadeh

Nga Nguyan

Peter W. Sweeney

E. Torkashvan

Nonvoting

Rassa Davoodpour

Frank M. Kutlak, RA

Duane S. Pinnix, PE

F.3.8 Environmental - Ad Hoc Committee

Name

Capt. Terry L. Christensen, PE

Alfred J. Ferruggiaro

Shawn Googins

Herbert B. Jacobi

Randolf Larsen

Mark F. Miller

Rand M. Mortimer

Edward A. Pfister

Nonvoting

Rassa Davoodpour

Frank M. Kutlak, RA

Albert P. Free, PD, CSP

Jeffrey M. Bauer, PE,
CIH, CSP
Michael S. Terpilak, CHP

John H. Keene, DR, PH
Biohaztec Associates, Inc.

F.3.9 Civil - Ad Hoc Committee

Name

James Carscadden, PE

Capt. Terry L. Christensen, PE

Mark F. Miller

Arvind Patel, PE

Daryl E. Paunil, PE

John Pavlides, PE

Shahriar Saleh, PE

Nonvoting

Rassa Davoodpour

Frank M. Kutlak, RA

Kenton J. Balenske, PE

Lynn M. Mueller, RLA

F.3.10 Standard Detail - Ad Hoc Committee

Name

Joseph M. Bladen

David H. Epley, PE

Herbert B. Jacobi

Thomas Ligis

Rand M. Mortimer

John Pavlides, PE

E. Torkashvan

Gary Zackowitz, RA

Nonvoting

Rassa Davoodpour

Frank M. Kutlak, RA

Dan Cushing, AIA

Duane S. Pinnix, PE

Wesson H. Miller, Jr., PE

Kenton J. Belanske, PE

F.3.11 A/E Checklist - Ad Hoc Committee

Name

Capt. Terry L. Christensen, PE

David H. Epley, PE

Ricardo C. Herring, AIA

Herbert B. Jacobi

J.P. Khoshbin, RA

Frank M. Kutlak, RA

Rand M. Mortimer

John Pavlides, PE

Nonvoting

Rassa Davoodpour

Dan Cushing, AIA

F.3.12 Style and Format - Ad Hoc Committee

Name

Ricardo C. Herring, AIA

J.P. Khoshbin, RA

Angela D. Watson

Gary Zackowitz

Nonvoting

Rassa Davoodpour

Dan Cushing, AIA

F.3.13 Contributors

Name

Charles C. Barrett

Frank A. Battistello

Nancy G. Boyd

Raymond Bowen

Clarence Bruce

Edward Burns

Harry S. Cepura

Mehryar Ebrahimi, P.E.

Paul Hawver

Erin L. Hoke

Paul Hudes

Herman M. Orrison

Justin Smith

Hillel Soclof

Roger Solomon

Karen D. Thomas

F.3.14 Founders

Name	
Terry Adsit	
Charles E. Blumberg, FIIDA	
Kenneth A. Brow, PE	
Davis H. Epley, PE	
Juanita M. Mildenberg, RA	
Jonas L. Morehart, PE	
Patricio Ochoa	
John Pavlides, PE	DES
Marshal White	DES
Ricardo C. Herring, AIA	


Office of Research Services