Resume for:
Ronald L. George, CIPE, CPD, President
Ron George Design & Consulting Services
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Profile:

Mr. George is president of a plumbing & mechanical design & consulting firm that specializes in plumbing, piping, fire protection and Air Conditioning system design. His firm also provides plumbing & mechanical code consulting services and plumbing product standard development and consulting services. He has over 30 years experience with plumbing & mechanical system design and he provides forensic investigation services for plumbing & mechanical system failures where he investigates mechanical systems failures that result in property damage, injury and death. He provides technical reports explaining the system or product deficiencies that led to failure. He also evaluates building mechanical systems and provides a report outlining the system conditions and code non-conformities for prospective buyers of large and complex buildings. He provides expert witness testimony in the form of depositions and courtroom testimony as required. His company also provides two dimensional and three dimensional computer aided design & drafting (CADD) services for all building types and Building Information Modeling (BIM) for building virtual 3D models of buildings and providing construction clearance coordination between trades before the building is constructed. Mr. George is very familiar with the Plumbing and Mechanical codes and standards and he sits on numerous plumbing code and plumbing product standard committees.
He has been involved with design and layout of plumbing & mechanical systems since 1978 for several major architectural/engineering and design/construct firms and since 2003 with his own firm. His clients include architectural firms, consulting engineering firms, contractors, attorneys and manufacturers.

He has experience designing plumbing & mechanical systems for all building types including; airports, stadiums, industrial manufacturing facilities, office buildings, commercial and retail buildings, hospitals, laboratories, prisons, jails, hotels, apartment buildings, military projects, high rise buildings and educational facilities. Some of his recent notable design experience includes:

- Detroit Lions new domed stadium (Ford Field, site of the 2006 Super Bowl),
- Detroit Metro Airport new midfield terminal (McNamara Terminal),
- University of Michigan - Life Sciences Lab Buildings
- University of Michigan - Rackham Hall Historic Building Renovations
- University of Michigan - Commons Building (Classrooms, Lecture Halls and Common Retail & Food Service spaces)
- University of Michigan - Undergraduate Science Classroom Building on Palmer Drive
- Michigan Technological University - Computer Science Building & Library addition, Houghton, MI
- New 9 story, Pontiac Osteopathic Hospital Addition - Operating rooms, Cafeteria & Bed tower
- St. Johns Hospital, Detroit, MRI addition and Emergency Room addition
- Oakwood Hospital Dearborn - E.R. addition, Cancer Center, Birthing Center and Utility system upgrades.
- The MGM Casino in Detroit
- The Motor City Casino Hotel Tower in Detroit
- 26 story- Book Cadillac Hotel & Condominium Renovation Project, Detroit, MI
- 23 story Fort Shelby Doubletree Hilton Hotel & Condos, Detroit, MI
- 8- Story, Woodward Ave. Lofts, condominium project, Ferndale, MI
- Petoskey Point – Hotel, Condo's, Convention Center, Theatre, Retail Mall, Petoskey, MI
- University of Michigan C. S. Mott Children's and Women's Hospital, Plumbing & Med Gas, Ann Arbor, MI
- St. Josephs Hospital, Critical Care tower Addn., Plumbing & Med Gas, Ann Arbor MI
- Beaumont Hospital, Royal Oak, MI and Troy, MI (Various Projects for Beaumont Services and Mech. Contr's)
- St. Josephs Hospital, Oakland County, Surgery Addition & Renovations, Plumbing & Med Gas, Pontiac, MI

Mr. George's responsibilities have included being the lead system designer responsible for plumbing and Fire protection system design on many of the projects which are listed bellow under: *Partial List of Project Plumbing & Fire Protection Design Experience*. He has also written construction specifications, performed cost estimates, and participated in value engineering and life cycle cost studies during the planning stages of many of the projects he has been involved in.
He has provided construction administration services that included: Construction inspection, Weekly field reports and reviewing mechanical equipment shop drawings for conformance with the specifications and contract documents. He has coordinated construction interferences other trades and construction interferences associated with substituted materials.

He has served numerous terms as an officer for the American Society of Plumbing Engineers local chapter and he has served as the Society's Vice President of Education. He has been writing a monthly column in *Plumbing Engineer Magazine* since 1993. He has also written plumbing design and code review feature articles for several other national engineering trade publications including: *PM Engineer Magazine, Consulting Specifying Engineer Magazine, Plumbing Standards Magazine* and several others.
In the year 2000 he was appointed by the International Code Council to serve on the International Plumbing Code Development Committee and in 2004, he was appointed to serve on the International Residential Plumbing & Mechanical Code Committee. He served as Chairman of the International Residential Plumbing & Mechanical Code Committee for four years. He also has served in the past as a member of the BOCA National Mechanical Code Interpretations Committee. He sits on the American Society of Mechanical Engineers A112 Plumbing Materials and Equipment main committee and he is a member of numerous ASME A112 plumbing products and materials standards task groups. He is a member of the American Society of Sanitary Engineering's (ASSE) main Product Standards Committee (PSC) and he serves on the ASSE Seal Control Board (SCB). He also serves on several ASSE plumbing product standard working groups. He regularly attends the model code hearings for the International Codes and the Uniform Codes. Mr. George is actively involved in Plumbing Code, Mechanical Code, Fuel Gas Code, Energy Code, Swimming Pool-Spa-Hot Tub Code and Fire Code development and he is involved plumbing product standard development with ASME, ASSE, ASTM, NFPA, ASPE and ISEA.

Mr. George is experienced in designing and investigation the following Plumbing and mechanical systems:
-Domestic Water & Process Water Distribution systems
-Backflow Prevention equipment and applications
-Domestic Hot Water Systems and equipment with an expertise in scald investigations.
-Heating and Chilled Water Systems
-Compressed Air systems: Medical, Laboratory, and Industrial
-Sanitary waste, Acid Waste and industrial Waste & Vent systems
-Storm Drainage systems (Conventional, Overflow & Siphonic)
-Fuel oil piping distribution systems & Equipment
-Gasoline & diesel storage, dispensing, piping & Equipment
-Fuel Gasses: Natural Gas, Propane, and Butane.
-Medical Gases: Oxygen, Nitrogen, Nitrous Oxide, Vacuum, Air, and Carbon Dioxide
-Lab Utilities & Gases: Helium, Hydrogen, Air, Vacuum, and Pure Water Distribution
-Steam & Condensate piping Systems
-Pure Water Distribution and re-circulation systems and materials.
- Heating Ventilation & Air Conditioning systems design, duct layout and sizing
-Plumbing and mechanical system failure analysis - Report writing, Forensic investigations & Litigation support.

Mr George provides Code and Standards consulting for and he is familiar with the following codes and standards:
ICC *- International Code Council:*
- ***IBC****, International Building code,*
- ***IMC****, International Mechanical code,*
- ***IPC****, International Plumbing code,*
- ***IFGC****, International Fuel Gas code,*
- ***IPMC****, International Property Maintenance code*
- ***IEC****, International Energy code.*

(Code and Standard Consulting Continued):

IAPMO *– International Association of Plumbing & Mechanical Officials, Uniform Codes:*

- ***UMC****, Uniform Mechanical Code*
- ***UPC****, Uniform Plumbing Code*
- ***USPHTSC****- Uniform Swimming Pool, Hot Tub & Spa Code.*
- ***USCC*** *– Uniform Solar Energy Code*

NFPA *- National Fire Protection Association:*

- *Fire Protection codes and Standards*
- *Medical Gas Standards*

ASSE *- American Society of Sanitary Engineering, Plumbing Product Standards*
ASME *- American Society of Mechanical Engineers, Plumbing Product Standards*
ASPE *- American Society of Plumbing Engineers, Plumbing System Design Standards*
CISPI *- Cast Iron Soil Pipe Institute, Piping material and installation standards*
ASHRAE *- American Society of Heating, Refrigeration and Air Conditioning Engineers Standards*
NSF *- National Sanitation Foundation Standards*
ADAAG *- Americans with Disabilities Act - Accessibility Guidelines, ICC/ANSI A117.1*
ISEA *-Int'l Safety Equipment Association ISEA/ANSI Z358.1 Emergency Fixture Standards*
PDI *- Plumbing and Drainage Institute – Material and Installation Standards*

Affiliations/Memberships:

Mr George is actively involved in the following organizations, committees and activities:

- ***International Code Council***, **(ICC)**
  - Former Chairman of the ***International Residential Plumbing & Mechanical Code Committee 2004-2009***.
  - Former member of the ***International Plumbing Code (IPC) Development Committee***
  - International Code Council Instructor for:
    - ***International Plumbing Code (IPC) seminars***
    - ***International Mechanical Code (IMC) seminars***
    - ***International Fuel Gas Code (IFGC) seminars***
    - ***International Residential Plumbing & Mechanical (IRC-PM) Code seminars***

- ***International Association of Plumbing & Mechanical Officials*** **(IAPMO)**
  - Member of the IAPMO "Standards Council"
    - The IAPMO Standards council oversees the ***Uniform Plumbing code, Uniform Mechanical Code, Uniform swimming Pool, Hot Tub & Spa Code*****,** and the ***Uniform Solar Energy Code.*** The committee also reviews all appeals to the code development process and they appoint members to the various code technical committees.
  - Member of the ***Uniform Plumbing Code*** "***Answers and Analysis Committee***"
    - This committee receives all requests for code interpretations and provides a written response to the petitioner. Throughout the year the committee provides answers to code questions and each year the committee meets to decide which questions are worth adding to the Code Interpretations Answers and Analysis book.

- ***Building Officials and Code Administrators*** **(BOCA)**
  - Former member Mechanical Code Interpretations Committee. This code organization no longer exists.

- ***American Society of Plumbing Engineers*** **(ASPE)**: Past President Eastern Michigan Chapter.
  - ASPE: Former Society Board Member, Vice President Education
  - ASPE: Member of the following Plumbing System Design Standard Committees:
  - Member, ASPE Venting design standard committee
  - Member, ASPE Water pipe sizing design standard committee
  - Member, ASPE "Temperature limits for Domestic Hot Water Systems" committee

-***National Fire Protection Association*** **(NFPA)**:
  - Member "Industrial committee"
  - Member "Health Care Facilities Committee".

Affiliations/Memberships (Continued):

-***Society of Fire Protection Engineers*** **(SFPE)**:
- Member Michigan Chapter.

- ***American Society of Mechanical Engineers*** **(ASME)** - Member of several plumbing product standard committees:
  - A112 Main Committee for all standards under ASME A112 plumbing product and material standards.
  - CSA/ ASME A112 North-American Harmonization Committee: For Canadian Standards harmonization.
  - A112.4.1, Relief Valve Drain, Member, Standard committee
  - A112.4.3, Water Closet Seal, Member, Standard committee
  - A112.4.7, Sub-metering systems, Member, Standard committee
  - A112.4.14, Manually operated 1/4 turn shut-off valves for plumbing systems, Member, Standard committee
  - A112.6.3, Floor Drains, Member, Standard committee
  - A112.6.4, Roof Drains, Member, Standard committee
  - A112.6.7, Floor Sinks, Member, Standard committee
  - A112.6.9, Siphonic Roof Drain Systems, Member, Standard committee
  - A112.14.3, Grease interceptors, Member, Standard committee
  - A112.14.4, Grease Removal Device, Member, Standard committee
  - A112.14.5, Oil interceptor, Member, Standard committee
  - A112.14.6: Biological Enzyme Grease Removal Device, Standard committee
  - A112.18.3 Backflow Device, Member, Standard committee
  - A112.18.6 Flexible Water Connector, Member, Standard committee
  - A112.18.8 Sanitary Waste Valves, Member, standard committee
  - A112.18.9, Protective covers for ADA Traps, member standard committee
  - A112.19.3 Vitreous China Plumbing Fixtures
  - A112.19.5 Water Closet Trim, Member, Standard committee
  - A112.20.1 Residential Fire Protection Installation Standard committee
  - A112.20.2 Medical Gas installation Standard committee
  - A112.20.3 Process Piping installation Standard committee

-***American Society of Sanitary Engineering*** **(ASSE)**:
  - Member and active with this Standards Development Organization.
  - Former *V.P. and current Director of the Michigan Chapter* ASSE
  - Member ASSE *Plumbing Product Standard Committee*
  - Member ASSE *Seal Control Board*
  - Member of the ASSE *Legionnaires Disease Research Committee*
  - Member of the ASSE *Plumbing Product Testing Laboratory Evaluation Committee*
  - Chairman of the ASSE *Plumbing Terminology Committee* responsible for updating the "*Plumbing Dictionary*"
  - Member of the ASSE *Plumbing Research Committee*
  - Member of the ASSE *Plumbing Technical Committee*
  - Member of the following ASSE plumbing product standard working groups:
    - ASSE 1010 Performance Requirements for Water Hammer Arrestors
    - ASSE 1016 Automatic Compensating Valves for Individual Showers and Tub/shower Combinations
    - ASSE 1017 Temperature Actuated Mixing Valves for Hot Water Distribution Systems
    - ASSE 1023 Performance Requirements for Hot Water Dispensers household Storage Type
    - ASSE 1070 Temperature Actuated mixing valves for point-of-use
    - ASSE 1071 Temperature Activated Mixing Valves for Emergency Fixtures
    - ASSE 1018 Trap Seal Primer Valves – Water Supplied
    - ASSE 1044 Trap Seal Primer Valves – Drainage Supplied
    - ASSE 1066 Individual Balancing In-line Valves for Individual Fixtures.
    - ASSE 1071 Temperature Actuated Mixing Valves for Emergency shower & Eyewash Applications
    - ASSE 1072 Trap Seal Protection Devices

In addition to the above committees, Mr George Participates in the following ASSE committees:

- ASSE Series 7000 Technical Committee (The ASSE technical committee that will oversee ASSE's Series 7000 certification program)
- ASSE alternate to Shannon Corcoran on the ASME A112 Plumbing Materials and Equipment Committee.

Mr George Participates in the following activities:

- Former Instructor - Oakland Community College, *Plumbing Design & Code Review* classes.
- Former Instructor - Lawrence Technological University, *Plumbing* & *Fire Protection* Classes
- Frequent Speaker at *ASPE, ASSE, SFPE, MBPA, ABPA*, *Mechanical Contractor* and *ICC* and *IAPMO* Inspector association meetings.
- Member Estral Beach, Michigan, Vol. Fire Department, **Firefighter/Medical Technician, former Fire Chief**. 1997 - present
- Former **Firefighter/Medical Technician**: Berlin Township, Michigan (Newport) Vol. Fire Department. 1996-2007
- Former **Firefighter/EMT, Captain,** Kennedale, TX Vol. Fire Department, 1980-1987
- Former Member, **Berlin Township, Water and Sewer Board of Directors**.
- Consultant to Berlin Township Water & Sewer Department.

Honors & Awards:

- **1993 ASPE Award of Merit,**
  Achieving goals as President of E. Mich. Chapter of the American Society of Plumbing Engineers
- **1994 ASPE Society Presidents Award** –
  For setting up and instructing Plumbing Design Courses at Oakland Community College.
- **1995 ASSE - L. Glenn Shields Award,** 1995,
  Michigan Chapter of ASSE Plumbing industry award for industry contributions.
- **1996 ASPE Society Directors Award** –
  For developing & instructing college courses on Advanced Plumbing Systems Design
- **2002 ASSE Michigan Chapter "Engineer of the Year" Award** –
  Received the "John E. Matthews - *Engineer of the Year Award*" from Michigan Chapter ASSE
- **2002 ASPE Service Award**
  - for serving as V.P. of Education for the American Society of Plumbing Engineers

Professional Work Experience:

The firms listed below are Architectural/Engineering firms for which I have been employed continuously since 1978.

President of Ron George Design & Consulting Services Monroe, Michigan
June 2003 – Present
Job duties included: Plumbing/Piping/Fire Protection & HVAC system design, plbg. & mech. code and standard consulting, Forensic Investigations for Litigation support, Technical Writing, Computer Aided Drafting (CAD) services.

SMITHGROUP INC. Architects, Engineers Detroit, MI
November, 1994 – June 2003 (9-1/2 years)
Job duties included: Plumbing/Piping/Fire Protection & assisted with HVAC Piping Systems Design for numerous Major Projects in the Detroit Metro Area and around the country. I provided construction administration on a few projects. I also performed forensic investigations for several attorneys in a litigation support role for plumbing systems failures that included scalding deaths and property damage. While at Smithgroup Inc., I wrote technical articles for several trade publications in my spare time and was trained on Autocad Relaese 14 and Release 2000.

SSOE ARCHITECTS, ENGINEERS, INC., Troy, MI
April 1992- November 1994
Job duties included: Plumbing/Piping/Fire Protection system for numerous building types. Design, & Training Seminars.

WOLF WINEMAN ENGINEERS, INC., Southfield, MI
December 1990 – April 1992
Job duties included: Plumbing/Piping/Fire Protection System Design, Construction inspection and administration.

EVERETT I. BROWN ARCHITECTS/ENGINEERS, INC., Indianapolis, IN
April 1990-December 1990
Job duties included: Plumbing/Piping/Fire Protection System Design, Construction inspection and administration.

UNITED CONSULTING ENGINEERS, Indianapolis, IN - contract position
February 1990-April 1990
Job duties included: Plumbing/Piping/Fire Protection System Design, Construction inspection and administration.

FLUOR DANIEL Engineers, Constructors, Greenville, SC - contract position
July 1989-February 1990
Job duties included: Managing the Plumbing/Piping/Fire Protection System Design for the Dupont Projects in the Delta Division, Construction inspection and administration. Cad Operation.

CRS SIRRINE Engineers, Constructors, Greenville, SC - contract position
November 1988-July 1989
Job duties included: Plumbing/Piping/Fire Protection System Design on an Intergraph CAD System.

PHILLIPS SWAGER ASSOCIATES Architects, Engineers, Peoria, IL - contract position
August 1987-November 1988
Job duties included: Plumbing/Piping/Fire Protection System Design on an Intergraph Microstation CAD System.

STONE & WEBSTER ENGINEERING CORPORATION, Engineers, constructors, Houston, TX - contract position
January 1987-August 1987
Job duties included: Preparing pipe support drawings in conformance with Nuclear Regulatory Commission Requirements for the Comanche Peak Nuclear Power Plant in Glenrose, Texas.

CARTER & BURGESS, INC. ENGINEERS-PLANNERS, Fort Worth, TX
July 1982-November 1986
Job duties included: Plumbing/Piping/Fire Protection System Design. During this time I was trained on the Intergraph Computer system for Computer Aided Design. (CAD)

LAWRENCE D. WHITE ASSOCIATES, ARCHITECTS/ENGINEERS, INC., Fort Worth, TX
February 1980-July 1982
Job duties included: Plumbing/Piping/Fire Protection System Design for Several Texas Prisons, The Fort Worth City/County Jail and numerous commercial projects.

LOVE, FRIBERG & ASSOCIATES, INC., Consulting Engineers, (presently Friberg, & Associates, Inc.), Fort Worth, TX
February 1978-February 1980
Job duties included: Plumbing System layout and drafting on numerous hospital, laboratories, universities, commercial and military projects under the direction of several plumbing & mechanical engineers.

Relevant Training/Education:

- Architecture/General studies University of Texas at Arlington, 1979 - 1980
- General Studies, Tarrant County College, Fort Worth, TX 1981 - 1984
- Fire Science Studies – Tarrant County College, Fort Worth, TX, 1980 - 1982
- Plumbing System Design Studies, Tarrant County College, Fort Worth, TX, 1980 - 1984
- Plumbing/Piping/Fire Protection Studies, Brookhaven College, Dallas, TX, 1985
- Plumbing/Fire Protection Design Seminar Series, DFW Chapter of A.S.P.E., 1979
- Heating Ventilation Air Conditioning (HVAC) Studies, Tarrant County College, Fort Worth, TX, 1982
- CAD Operator Training, "AutoCAD 14 & AutoCAD 2000" Schoolcraft College, Livonia, MI, 2000
- CADD Operator Training, "Intergraph Vax and Microstation" Intergraph Corporation, 1983
- Fire Sprinkler & Standpipe Systems, Tarrant County College, Fort Worth, TX, 1982
- Irrigation Systems Design, Weathermatic "College of Irrigation Knowledge", Dallas, TX, 1982
- Automatic Sprinkler Systems Plan Review Seminar sponsored by N.F.P.A., Chicago, IL, 1990
- Fire Sprinkler Systems Seminar, Viking Corp., Hastings, MI, 1997
- (3) Boiler/Water Heater Design Seminars, PVI Industries, Fort Worth, TX, 1978, 1980, 2000
- Boiler/Water heater Seminar - Sellers Corp., Lexington, KY, 1980
- Water Heater Seminar - Bradford-White Corp., Grand Rapids, MI 1997, 2001
- Kohler Mfg Fac., Kohler Wisconsin, Cast Iron fixture manufacturing processes seminar 2001
- Kohler Mfg Fac., Kohler Wisconsin, Vitreous China Manufacturing process seminar 2001
- Copper fin tube water heater / boiler Seminar – Lochinvar Corp., Nashville, TN, 1995, 2003
- Copper fin tube water heater / boiler seminar Weben Jarco Corp. – Dallas, TX, 1985
- Copper fin tube water heater / boiler Seminar - RBI Water Heaters, Ontario, Canada, 1998
- Pump Systems Design Seminar – Bell & Gossett 'Little Red School House', Chicago, IL 1995
- Chilled Water and Heating Hot Water Water-Hydronic System Seminar – Bell & Gossett 1985, 2000
- Steam & Condensate Piping Systems Seminar – Bell & Gossett, 1995, 2000
- Mixing Valve Seminar – Leonard Valve Co., 1995
- Mixing Valve Seminar – Symmons Valve Co. Boston, MA, 2003
- Mixing Valve Seminar – Lawler Valve, Ind., IN., 1998
- Mixing Valve seminar – Armstrong - Rada Valve Co. – Three Rivers, MI, 2003,
- Certification Program - Legionellae Control in Healthcare Facilities Seminar, 2001
- Legionellae Control in Plumbing & Mechanical Systems Seminar, Armstrong Industries, 2005
- PC Computer systems training, Greenville Tech. College, Greenville, SC, 1997
- Business Administration studies, Greenville Tech. College, Greenville, SC, 1997
- Uniform Plumbing Code Inspector Training, Lansing, MI, 1992
- BOCA Plumbing Code Training Seminar, Grand Rapids, MI, 1995
- BOCA Plumbing Code Training Seminar, Detroit, MI, 1991
- Plumbing Inspectors Courses, Keego Harbor, MI, 1992, 1993, 1995, 1996, 1998, 2000, 2002, 2004,
- Fire Investigator Training – International Association of Arson Investigators – Mich. Chapter – 2003
- Cast Iron Pipe Testing Class, CISPI Certified Testing Lab, (Hardness test, tensile test, Metallurgy) 2007
- Cast Iron Pipe Installation Class - Charlotte Pipe Training Facility, Charlotte, NC. Cast Irion Pipe Foundry Tour 2008
- Plastic Pipe Installation Class - Charlotte Pipe Training Facility, Charlotte, NC, Plastic Pipe Manufacturing Plant Tour 2008
- Charlotte Pipe & Foundry, College of Plumbing Knowledge, Charlotte, NC 2007
- Weekly Firefighter and Medical First Responder Continuing Education training through Berlin Township Volunteer Fire Department.
- Western Mich. Univ. – Cause & Origin of Water Heater & Appliance Fires – Fire Findings Laboratories, Benton Harbor, MI, 2005
- Attendance at monthly Amer. Soc. of Plumbing Engineers, technical meetings on various topics for continuing education to maintain CEUs for "Certification in Plumbing Design" , 1979 thru present, monthly technical seminar re-certification training 2 hours/month.
- Attendance at annual ASPE Educational Conventions & Symposiums to maintain CEUs for "Certification in Plumbing Design" 1980 thru present, Approx 12 hours of training per year.
- Attendance at annual meetings for numerous industry plumbing related groups: American Backflow Prevention Association, American Society of Sanitary Engineering, National Fire Prot. Assoc'n, Plumbing Inspectors Assoc. of Michigan, ICC, IAPMO, ASSE, ASME, ASTM and other industry meetings for codes and standards continuing education seminars.

Certifications:

- Certified in Plumbing Engineering (CIPE) – By Exam - American Society of Plumbing Engineers, 1983
- Certified in Plumbing Design – (CPD) 2000 American Society of Plumbing Engineers renewed with continuing education
- Licensed Irrigator, State of Texas 1982-1986
- Certified Fire Investigator, International Association of Arson Investigators, Michigan Chapter. 2003

Related interests:

- Former Instructor for: ASPE Plumbing Design Courses at Oakland Community College.
- Lecturer for: Environmental Systems class on plumbing & fire protection topics at Lawrence Technological University.
- Instructor for: Plumbing System Design and Code seminars for Michigan Chapters of ASPE and ASSE.
- Speaker at American Backflow Prevention Association's annual seminars
- Formerly a monthly columnist for the "***Designers Guide "*** column in "***Plumbing Engineer Magazine"***
- Currently the monthly columnist for the **"*Code Update"*** Column in "***Plumbing Engineer Magazine"***
- Speaker at University of Michigan Fire Prevention & Control Seminars.
- Trained as Firefighter 1, Firefighter 2, and Hazardous materials operations, through State of Michigan curriculum as a member of Berlin Township Volunteer Fire Department Trained in Emergency Medical Services including burn care and I maintain over the 24 hours minimum of medical training CEUs every 3 years for Berlin Township Vol. Fire Department and Estral Beach Volunteer Fire Department.
- Former Fire Chief Estral Beach Volunteer Fire Department currently an active member of the department.

Publications:

I am a monthly columnist and technical editor for "Plumbing Engineer Magazine", I served as a technical editor for "Plumbing Systems & Design Magazine" and I have written numerous articles for various plumbing industry magazines such as "Plumbing Systems & Design Magazine", "PM Engineer Magazine"; "Consulting Specifying Engineer Magazine"; "Plumbing Standards Magazine"; "Building Design & Construction Magazine" "Wholesaler Magazine" and "Facilities Maintenance Magazine". I have written over 200 articles published in these plumbing engineering related publications. The following is a partial list of books and published articles:

Date	Title of Book	Publisher
2009	Plumbing Dictionary – Seventh Edition	The American Society of Sanitary Engineering
2009	Energy & Water Conservation Guideline Book	The American Society of Sanitary Engineering
2007	2006 International Plumbing Code Study Companion	The International Code Council

Date	Title of Article	Title of the Publication
4/08-Pres.	Monthly Plumbing, Mechanical and Fuel Gas Code and Standard updates	Plumbing Engineer Magazine
3/08	Domestic Hot Water and Scald Prevention in the Codes	Plumbing Engineer Magazine
2/08	Emergency Fixtures and the Codes	Plumbing Engineer Magazine
1/08	Cast Iron pipe and the Standards	Plumbing Engineer Magazine
1/07 thru 12-07	(12) Monthly Proposed Code Change/ Code Update Columns.	Plumbing Engineer Magazine
12/06	Code Update – UPC Code Changes - 2003 to 2006 - Part 3	Plumbing Engineer Magazine
12/06	The History of Emergency Fixture Water Tempering Systems	Plumbing Engineer Magazine
11/06	Code Update – UPC Code Changes - 2003 to 2006 - Part 2	Plumbing Engineer Magazine
10/06	Code Update – UPC Code Changes - 2003 to 2006 - Part 1	Plumbing Engineer Magazine
09/06	Code Update – IPC Code Changes - 2003 to 2006 - Part 6	Plumbing Engineer Magazine
08/06	Code Update – IPC Code Changes - 2003 to 2006 - Part 5	Plumbing Engineer Magazine
07/06	Code Update – IPC Code Changes - 2003 to 2006 - Part 4	Plumbing Engineer Magazine
06/06	Code Update – IPC Code Changes - 2003 to 2006 - Part 3	Plumbing Engineer Magazine
05/06	Code Update – IPC Code Changes - 2003 to 2006 - Part 2	Plumbing Engineer Magazine
04/06	Code Update – IPC Code Changes - 2003 to 2006 - Part 1	Plumbing Engineer Magazine
03/06	Standard Update – Mixing Valve standard has trouble gaining support	Plumbing Engineer Magazine
02/06	Code Update – A report on the International Plumbing code Hearings	Plumbing Engineer Magazine
01/06	Code Update – One Code Progress – San Antonio	Plumbing Engineer Magazine
12/05	New Plumbing Product Standards being Developed	Plumbing Engineer Magazine
11/05	Standard Update – ASPE HW Design Standard Committee	Plumbing Engineer Magazine
10/05	Hurricane Katrina code issues for the rebuilding effort	Plumbing Engineer Magazine
09/05	Point – Counterpoint, Trap Primers vs Trap seal protection devices	Plumbing Engineer Magazine
09/05	One Plumbing Code and One Mechanical Code Are A Possibility!	Plumbing Engineer Magazine
08/05	ASSE Standards update	Plumbing Engineer Magazine
08/05	Trap Primers and the Code	Plumbing Engineer Magazine
07/05	Code Update – Update on ICC code adoptions and UPC code changes	Plumbing Engineer Magazine
06/05	Update on ASSE Standards	Plumbing Engineer Magazine
05/05	Code Update – Uniform Plumbing Code Hearings Denver, CO	Plumbing Engineer Magazine
04/05	Code Update – A report on the International Plumbing code Hearings	Plumbing Engineer Magazine
04/05	SNAFU with Canadian Standards at ICC Code Hearings	Consulting-Specifying Engineer Magazine
03/05	Code Update Column – Grease interceptor requirements in the codes	Plumbing Engineer Magazine
11/04	Commercial Kitchen Plumbing for Contractors	Reeves Journal
11/04	Grease Interceptors	PM Engineer Magazine
02/04	Commercial Kitchen Plumbing	PM Engineer Magazine
09/03	Specification Section Revisions	PM Engineer Magazine
06/03	Code Changes for Thermostatic Mixing Valves	PM Engineer Magazine
03/03	Sizing Water Heaters for Hotels/Motels	PM Engineer Magazine
08/02	Get Ready to Learn New Spec Section Numbers – Changes are proposed in the CSI format	Plumbing Engineer Magazine
07/02	Water Flow Testing - to Determine Design Pressures.	Plumbing Engineer Magazine
06/02	Swimming Pool Design considerations	Plumbing Engineer Magazine
05/02	Master Thermostatic Mixing Valve Sizing	Plumbing Engineer Magazine
05/02	2002 ASPE Education Report	Plumbing Engineer Magazine
04/02	Thermal Expansion in Hot Water Systems	Plumbing Engineer Magazine
03/02	Valve Types and their Applications	Plumbing Engineer Magazine
02/02	Food Waste Grinders and Grease Interceptors	Plumbing Engineer Magazine
01/02	The Industry has lost a Key Player – Tribute to Pat Higgins	Plumbing Engineer Magazine
01/02	Who's who in ASPE – List of ASPE Officers	Plumbing Engineer Magazine
01/02	Not Everything that Leaks is Broken – Relief Valves & Backflow Preventers	Plumbing Engineer Magazine
12/01	Shop Drawings and Product Submittals	Plumbing Engineer Magazine
11/01	Questions & Answers: Corrosion in Drains a Galvanic Installation	Plumbing Engineer Magazine
10/01	A Scalding Hot Topic – Domestic Hot Water System Temperatures	Plumbing Engineer Magazine
09/01	Water Properties and Treatment Methods	Plumbing Engineer Magazine

Date	Title of Article	Title of the Publication
08/01	Island Fixture Venting	Plumbing Engineer Magazine
07/01	Piping Materials	Plumbing Engineer Magazine
06/01	The History of Plumbing Part – 4 Modern Plumbing Enhances the American Way of Life.	Plumbing Engineer Magazine
06/01	Troubleshooting Pumps – Commons Pump Start-up Problems	Plumbing Engineer Magazine
05/01	The History of Plumbing Part – 3	Plumbing Engineer Magazine
05/01	Legionnaires' Disease and Plumbing Systems	Plumbing Engineer Magazine
04/01	The History of Plumbing Part – 2	Plumbing Engineer Magazine
Partial list of publications: (Cont.)		
04/01	Questions & Answers: Pump Check Valves, Pump Sizing, Roof Sumps, shower Pan Liners, PVC pipe	Plumbing Engineer Magazine
03/01	RLE Quiz over the Technical Proceedings of the 2000 ASPE Convention	Plumbing Engineer Magazine
03/01	Hot Water Temperature Maintenance and the Codes	Plumbing Engineer Magazine
03/01	The History of Plumbing Part – 1	Plumbing Engineer Magazine
02/01	Drainage System Venting	Plumbing Engineer Magazine
02/01	Education Update	Plumbing Engineer Magazine
01/01	Mechanical & Plumbing Design Checklist	Plumbing Engineer Magazine
12/00	The Last Question & Answer Forum of the Millenium	Plumbing Engineer Magazine
11/00	Piping Insulation Design Considerations	Plumbing Engineer Magazine
10/00	The First Building Code, The Hammurabbi Code	Wholesaler Magazine
10/00	Americans with Disabilities Act and Plumbing Systems	Consulting-Specifying Eng. Magazine
10/00	Pressure Balancing vs Thermostatic Mixing Valves	Plumbing Engineer Magazine
09/00	Q & A's – HW Return, Water Hammer, Booster Pump Sizing	Plumbing Engineer Magazine
08/00	Grey Water Systems	Plumbing Engineer Magazine
07/00	History of Venting	Plumbing Engineer Magazine
06/00	High Water Mark" (Commercial Irrigation Systems)	Consulting-Specifying Eng. Magazine
06/00	Questions & Answers – HW Return Systems	Plumbing Engineer Magazine
05/00	Copper Water Piping	Plumbing Engineer Magazine
03/00	Domestic Hot Water Recirculation Systems	Plumbing Engineer Magazine
02/00	Design Considerations for Low Flow Fixtures	Plumbing Engineer Magazine
01/00	Preparation of Plumbing Drawings	Plumbing Engineer Magazine
12/99	Contributions to the Information Pool	Plbg. Eng. Mag. (Q&A compilation)
11/99	Thermal Shock and Hot Water Storage Temperature	Plumbing Engineer Magazine
10/99	Sizing Domestic Cold Water Systems with Flushometer Valves	Plumbing Engineer Magazine
9/99	Domestic Hot Water Systems for Commercial Kitchens	Plumbing Engineer Magazine
8/99	Compressed Air Energy Savings	Plumbing Engineer Magazine
7/99	More on the Review of Schematic Design on Development Drawings	Plumbing Engineer Magazine
6/99	Reviewing Schematic Design on Development Drawings	Plumbing Engineer Magazine
5/99	Plumbing Fixtures	Plumbing Engineer Magazine
4/99	A Plumbing Library	Plumbing Engineer Magazine
3/99	Fuel Gas Systems	Plumbing Engineer Magazine
2/99	Construction Administration	Plumbing Engineer Magazine
1/99	Calculating Pressure Losses	Plumbing Engineer Magazine
12/98	Water Hammer Arresters	Plumbing Engineer Magazine
11/98	Storm Drainage Systems	Plumbing Engineer Magazine
11/98	The History of Codes	Plumbing Engineer Magazine
10/98	The "Wonder Years" the last 25 years of plumbing evolution	Plbg. Eng. Mag.25th Anniv. Issue
9/98	Irrigation Systems, Part 2	Plumbing Engineer Magazine
8/98	Irrigation Systems, Part 1	Plumbing Engineer Magazine
7/98	Web Site Helps Project Communications	Plumbing Engineer Magazine
6/98	Trust Your Instincts: Give Value Engineering a Chance	Plumbing Engineer Magazine
5/98	Softening the Hard Water Problem	Plumbing Engineer Magazine
4/98	A Septic System Overview	Plumbing Engineer Magazine
3/98	Heat Recovery Systems	Plumbing Engineer Magazine
2/98	Process Piping Layout and Design Recommendations, Part 2	Plumbing Engineer Magazine
1/98	Process Piping Layout and Design Recommendations, Part 1	Plumbing Engineer Magazine
12/97	Pressure Reducing Valve Stations	Plumbing Engineer Magazine
11/97	Controlling Water Hammer in Plumbing Systems	Plumbing Engineer Magazine
10/97	Organizing Your Plumbing Design System, Part 2	Plumbing Engineer Magazine
9/97	Organizing Your Plumbing Design System, Part 1	Plumbing Engineer Magazine
8/97	Pure Water Systems	Plumbing Engineer Magazine
7/97	Piping Accessories	Plumbing Engineer Magazine
6/97	Pipe Expansion and Contraction Design Considerations	Plumbing Engineer Magazine
5/97	Fire Sprinkler Design Considerations	Plumbing Engineer Magazine
4/97	Acoustics in Plumbing Design	Plumbing Engineer Magazine
3/97	The Internet: Making the World Smaller	Plumbing Engineer Magazine
2/97	Selecting Swimming Pool Water Heaters	Plumbing Engineer Magazine

Date	Title of Article	Title of the Publication
1/97	Acid Waste Systems	Plumbing Engineer Magazine
12/96	Fuel Oil Systems, Part 2	Plumbing Engineer Magazine
11/96	Fuel Oil Systems, Part 1	Plumbing Engineer Magazine
10/96	Specifying Fire Protection Systems Using Division 13	Plumbing Engineer Magazine
9/96	An Introduction to Compressors	Plumbing Engineer Magazine
8/96	Backflow Prevention for Irrigation Systems	Plumbing Engineer Magazine
7/96	Comments on the Specifics of Specifications	Plumbing Engineer Magazine

Partial list of publications: (Cont.)

6/96	Selection and Application of Pipe Hangers and Supports	Plumbing Engineer Magazine
5/96	Natural Gas Piping - Drip Legs & Sediment Traps	Plumbing Engineer Magazine
4/96	The History of Plumbing	Plumbing Standards Magazine
4/96	Plumbing Design for Detention Facilities	Plumbing Engineer Magazine
3/96	Estimating Water Demand, Part 2	Plumbing Engineer Magazine
2/96	Estimating Water Demand, Part 1	Plumbing Engineer Magazine
1/96	Determining Available Water Pressure for Hydraulic Calculations	Plumbing Engineer Magazine
12/95	Design Considerations for Backflow Preventers in Basements - Part 2	Plumbing Engineer Magazine
11/95	Design Considerations for Backflow Preventers in Basements – Part 1	Plumbing Engineer Magazine
10/95	Water Conservation in Commercial/Institutional Buildings	Plumbing Engineer Magazine
9/95	Sizing Domestic Hot Water Systems	Plumbing Engineer Magazine
8/95	Certification in Plumbing Engineering Exam Review No. 3	Plumbing Engineer Magazine
7/95	Design Considerations for Hospital Plumbing	Plumbing Engineer Magazine
6/95	Fire Sprinkler Systems and Backflow Prevention	Plumbing Engineer Magazine
5/95	Certification in Plumbing Engineering Exam Review Quiz No. 2	Plumbing Engineer Magazine
4/95	Thermal Expansion in Hot Water Systems	Plumbing Engineer Magazine
3/95	Certification in Plumbing Engineering Exam Review (No. 1)	Plumbing Engineer Magazine
2/95	Storm Drainage Systems	Plumbing Engineer Magazine
1/95	Hot Water Systems Quiz	Plumbing Engineer Magazine

Partial List of Project Plumbing & Fire Protection Design Experience for Ronald L. George:

Industrial Projects:

Caterpillar Corporation,
Building VV Addition, Peoria, Illinois.
Daimler / Chrysler Automotive Corporation,
New Headquarters Building 16 - Stories**,** Auburn Hills, Michigan.
Daimler / Chrysler Automotive Corporation,
Information Services Offices, Auburn Hills, Michigan.
Daimler / Chrysler Automotive Corporation,
Materials Lab, Auburn Hills, Michigan.
Daimler / Chrysler Automotive Corporation,
Building 18 Expansion, Auburn Hills, Michigan.
Daimler / Chrysler Corporation,
New Paint Shop, Newark, Delaware.
Daimler / Chrysler Corporation,
Power House & Air Compressor Plant, Dayton, Ohio.
Ford Motor Company,
Scientific Research Lab, Dearborn, Michigan.
General Motors Corporation
Vehicle Assembly Plant , Lake Orion, Michigan.
General Motors Corporation,
Vehicle Proving Grounds, Milford, Michigan.
General Electric Co.
Aircraft Engine Turbine Plant, Greenville, South Carolina.
Kodak Co.
Film Processing Facility, Rochester, New York.
Kimberly/Clark Paper Company,
Pulp and Paper Mill, Jenks, Oklahoma.

Governmental Projects:

National Institute for Standards & Technology NIST
Fuel oil system study. Forensic evaluation and failure analysis for the existing power plant fuel system.
National Institute for Standards & Technology NIST
Fuel Oil System design for the new power plant expansion.
Tarrant County Texas, City/County Jail and Courts Complex
8-Story Jail & Courts Building, Fort Worth, TX
Burnett Park Fountains,
Decorative Water Fountains, Fort Worth, TX.
Lake County Jail, County Jail and Criminal Justice Facility
Crown Point, Indiana.
Spencer County/Jail
Rockport, Indiana.
Noblesville Park & Recreation Department,
(2) Golf course irrigation systems with pump houses, Noblesville, IN.
Texas State Capital Building,
Renovation of Lt. Governor's Quarters, Austin, TX.
Texas State Capital Building,
Renovation of the State Senate Chambers, Austin, TX

Utility Projects:

Texas Utilities – Comanche Peak Nuclear Power Plant
Pipe Support Design & Engineering to NRC Requirements, Glen Rose, TX
Village Creek Wastewater Treatment Plant
Fort Worth, Texas
National Institute for Standards & Technology NIST
Fuel Oil System design for the New Power Plant Expansion

Utility Projects (cont.):

Michigan Bell Telephone Company,
24 - Fuel Oil Tank & Piping Projects for telephone switching centers. New emergency generators & double wall diesel fuel tanks with double wall fuel oil piping & leak detection and tank inventory monitoring systems.
-Detroit, MI, multiple locations
-Cadillac, MI
-Marquette, MI
-Lansing, MI
-Grand Rapids, MI
-Pontiac, MI
-Birmingham, MI
-Ann Arbor, MI
-Port Huron, MI
-Saginaw, MI
-Farmington Hills, MI
-Bloomfield Hills, MI
-Jackson, MI

Institutional – HealthCare Projects:

Oakwood Hospital and Medical Center,
Cancer Center, Labor & Delivery Addition & Utility Additions and Renovations, Dearborn, MI
Pontiac Osteopathic Hospital,
Master plan and Patient Tower Addition, Pontiac, MI
Detroit Medical Center,
Clinical Cancer Center, Detroit, MI
Detroit Medical Center,
Women's Center, Two new 9-Story Buildings with 3-story connector bridge, Detroit, MI
Detroit Medical Center,
Vascular Institute, 9 story building, Detroit, MI
St. John Hospital and Medical Center,
Emergency Room Renovation, Detroit, MI
St. John Hospital and Medical Center,
MRI Unit Addition, Detroit, MI
St, Josephs Hospital
Critical Care Tower Addition – Ann Arbor, MI
St, Josephs Hospital
Surgery Center Addition and Renovations – Pontiac, MI
Bethania Regional Healthcare Center,
Expansion and Renovation, Wichita Falls, TX
Harper Hospital
Cardiac Catheterization Lab. /Detroit Medical Center, Detroit, MI
Beaumont Hospital,
Anatomic Pathology Lab, Royal Oak, MI
Botsford Hospital
New Endoscopy Suites, Farmington Hills, MI
Botsford Hospital
New Emergency Room and Operating Room Addition, Laboratories, Operating Rooms and support areas,
Labor & Delivery rooms, Dietary Department, Commercial Kitchen & dining facilities, Central Sterile Supply and Rooftop Heliport.
Mount Clemens General Hospital
4- story - Heart Center, Mount Clemens, MI
Henry Ford Hospital
New hospital – Bloomfield Hills, MI
Oakwood Southshore Hospital
5-story addition – Trenton, MI
C.S. Mott Childrens & Womens Hospital at University of Michigan
New 523 Million Dollar Children's & Women's Hospital – Ann Arbor, MI

Educational Projects:

Carmel High School,
One million square foot addition to existing High School, Carmel, IN
Carmel High School,
5000 seat Football stadium/Athletic complex, Irrigation system, showers/lockers, food service & support facilities, Carmel, IN.
North Branch High School,
New High School, North Branch, MI
University of Michigan – Dearborn Campus,
College of Science & Letters, Dearborn, MI
University of Michigan – Anna Arbor Campus
Life Sciences Laboratory Building
University of Michigan – Ann Arbor Campus,
Rackham Hall Renovations
University of Michigan – Ann Arbor Campus,
Palmer Drive Parking Structure
University of Michigan – Ann Arbor Campus,
New Palmer Drive Chiller Plant
University of Michigan – Ann Arbor Campus,
Commons Building, 8 story, conference center & cafeteria
University of Michigan – Ann Arbor Campus,
Palmer Drive "L" Building, 5-Story, Laboratory Classroom Building
University of Michigan – Ann Arbor Campus,
Palmer Drive Plaza - Fountains, drains & snow melt system
Michigan State University
Agricultural Hall - Lansing, MI
Michigan State University
Shaw Hall - Dormitory Building, Lansing, MI
Michigan State University
Shaw Lane - Parking structure, Lansing, MI
Michigan Technological University
Environmental Science Building, Houghton, MI
Delta College
Project A - Industrial Arts Building renovations and addition, Saginaw, MI
Delta College
Project B - Swimming Pool, Physical Education, and Cafeteria Renovations and Additions, Saginaw, MI
Delta College
Fire Protection Master Plan, Saginaw, MI

Military Projects:

U. S. Navy, Bachelor Enlisted Quarters,
(9) – High Rise Apartment Buildings, Great Lakes Naval Training Center, IL
U. S. Navy, Naval Facilities Command NAVFAC-Chesapeake,
Ship Materials Technology Facility, Naval Surface Warfare Center, Bethesda, MD
U. S. Navy, Aircraft Maintenance Hanger,
Naval Air Station, Dallas, TX
U. S. Army, Aircraft Maintenance Hanger & Shops,
Robert Gray Army Airfield, Fort Hood, TX
U. S. Army, Barracks Rehabilitation,
Foot Hood, Fort Hood, TX
U. S. Air Force, Enlisted personnel Dining Facility,
Carswell AFB, Fort Worth, TX
U. S. Air Force, Enlisted Personnel Housing,
Carswell AFB, Fort Worth, TX
U. S. Army, Armored Vehicle Weapons Training Center.
Survey and Renovation of Mechanical Systems in 500 Barracks and Support Buildings, Fort Polk, LA
U. S. Army, Senior Non-Commissioned Officers Academy,
Fort Bliss, TX
U. S. Navy, Water Tower & Pump House Building,
400,000 gallon water tower to provide adequate water pressure for several new buildings,
Great Lakes Naval Training Center, IL

Commercial Projects:

Sky Chefs, Commercial Airlines Kitchen
Dallas/Fort Worth Airport, TX
Sky Chefs, Commercial Airlines Kitchen
Los Angeles International Airport, CA
Waller Creek Office Tower and Parking Garage,
12 Story Office/Parking Garage, Austin, TX
Allied Bank and Office Tower,
4 - story building, Port Arthur, TX
Federal Office Building,
4 - story building, Port Arthur, TX
Midland Plaza, Office Building,
6 – Story building, Midland, TX
Savings West Office Building,
7 – Story office building, Fort Worth, TX
Waller Creek Hotel and Restaurant,
12-story hotel & Restaurant building, Austin, TX
COBO Hall
Expansion & Renovations of Convention Center, Concessions & Restrooms, Detroit, MI
Cottonwood Village Apartments,
Dallas, TX
Federal Express Freight Facility,
Indianapolis, IN
Park Central Bowling Lanes,
Bowling Center, Fort Arthur, TX
Park Central Shopping Center,
Shopping Mall, Port Arthur, TX
Regency Park Condominiums,
2-story condos, Port Arthur, Tx
Wedgewood Station Post Office
Altamesa Boulevard, Fort Worth, TX
MGM Casino/Hotel
Detroit, MI
Book Cadillac Marriott Hotel/Apartments
Detroit, MI
YMCA Health Club, Detroit
Detroit, MI
YMCA Health Club, Milford
Milford, MI
Fort Shelby – Doubletree Hilton Hotel
23 Story Hotel & condo project, Detroit, MI

Retail Projects:

Meijer Stores Projects
Store #25 Addn., Okemos, MI; Store #30 Remodel, Jackson, MI; Store #51 Addn. & remodel, Findlay, OH
Store #117 Sylvania Twp., OH; Store #119 Kalamazoo, MI; Store #124 Fort Wayne, IN; Store #125 Fort Wayne, IN
Store #126 Mansfield, OH
Super K-Mart Stores
Terre Haute IN
Evansville, IN
Spartanburg, SC
Greenwood, CO
Mervyn's Department Store
Flint, MI

Institutional – Jail / Prison Projects:

Texas Department of Corrections, Cofield Unit
2500-man Prison, Huntsville, TX
Texas Department of Corrections, Ellis II Unit
2500-man Prison, Huntsville, TX

Institutional – Jail / Prison Projects (Continued):

Texas Department of Corrections, Furgeson Unit
Additions and renovations, Huntsville, TX
Texas Department of Corrections, Pack III Unit
2500-man Prison, Huntsville, TX
Ft. Worth/Tarrant County, City/County Jail
8-Story Building, Fort Worth, TX
Lake County Jail, County Jail and Criminal Justice Facility
Crown Point, IN
Spencer County Jail,
Rockport, IN

Laboratory Projects:

University of Michigan – Ann Arbor Campus
Life Sciences Laboratory Building
Daimler / Chrysler Corporation, Materials Lab,
Auburn Hills, MI
E.I. DuPont Co.,
Medical Products Research Laboratory, Chambers Works Plant, Deepwater, NJ
Ford Motor Company,
Scientific Research Lab, Dearborn, MI
University of Michigan - Dearborn,
Collage of Science & Letters, Dearborn, MI
Michigan State University - Agricultural Hall
Agriculture Science Labs - Lansing, MI
Michigan Technological University
Science Building, Houghton, MI
Harper Hospital
Cardiac Catheter Lab. /Harper Hospital Projects.
Beaumont Hospital,
Anatomic Pathology Lab, Royal Oak, MI
Vic Wertz, Clinical Cancer Research Center,
Wayne State University/Detroit Medical Center, Detroit, MI

Stadium/Assembly Building Projects:

New Major League Baseball Stadium, Detroit Tigers – Comerica Park
Detroit, MI
New National Football League Foot Ball Stadium, Detroit Lions – Ford Field
Detroit, MI
Renovations - Will Rogers Memorial Coliseum Renovations – Multi Use Arena
Fort Worth, TX
New Detroit Lions – Headquarters and Training Facility
Allen Park, MI

Airport Projects:

Dallas / Fort Worth International Airport
Terminal 3E HVAC Improvements and Admirals Club Addition
Terminal 2W Renovations
Terminal 3E Airside Expansion
Terminal 4E Section C Federal Inspection Facility
Terminal 2E-3E Apron Control Tower
Terminal 3E Section C Expansion
Terminal 3E A & B Lounge & Restroom additions
Cleveland Hopkins International Airport
New Concourse D and connector tunnel
Detroit/Wayne County Metropolitan Airport
New Midfield Terminal – Ed McNamara Terminal
Detroit/Wayne County Metropolitan Airport
Regional Commuter Terminal

Forensic Investigations/Plumbing & Mechanical System Investigation: 1998 - 2008

National Institute of Standards & Technology - Fuel oil System Failure
(Investigation & Report on recommended corrective actions)

Mr. George was asked to investigate a fuel system pump failure that baffled facility engineers and contractors. He provided an investigation, hydraulic analysis and report showing the cause of multiple fuel oil pump failures that led to their fuel oil system to shut-down during a changeover from natural gas to fuel oil during the winter peak months. The facility had several large boilers that operated on dual fuel burners and they receive a discounted fuel rate for switching to fuel oil during periods of peak demand on the natural gas system. The problem was found to be air that became trapped in a high point an oversized fuel oil suction piping header. The piping system design caused high velocity areas that caused foaming of the fuel oil and low velocity areas with oversized pipes that allowed a large air pocket to develop over a period of time and eventually the air was drawn into the fuel oil pump suction and it caused pump cavitation in the primary fuel oil pump. When the operator switched to the back-up pump it immediately suffered the same fate because the air pocket had already formed. The back-up pump was damaged within a few minutes. Mr George determined the cause of the problem and provided a report and drawings with recommended piping changes to solve the problem. The system has been working fine since then. - Gaithersburg, MD

Roof Collapse

Warehouse Building - Brownstown, MI. Mr. George was asked to investigate a roof collapse at a warehouse building where a roof had collapsed after a rain storm. After performing the sizing calculations, it appeared the engineer of the building used the wrong scale when he measured the roof areas to calculate roof drainages sizes. The engineer of record's defense was that yes he used the wrong scale but, controlled flow roof drainage systems are allowed and that type of system would allow water to pond on the roof and discharge at a lower flow rate to prevent flooding of nearby storm drains and streams. When asked if this was the design intent, and was the structural engineer involved in the process, it was found there was no communication with the structural engineer to plan on several feet of water being allowed to pond on the roof.

Fire Pump/Water Main Failures

Investigation of a fire protection system failure for a warehouse building near Detroit, MI.
A water main leak from an old fire main caused the water pressure to drop in the fire protection loop around a warehouse building. When the flow exceeded the capacity of the pressure maintenance pump or jockey pump, the main fire pump started and according to NFPA requirements it does not cycle off and it must be alarmed to a central alarm station. The warehouse facility had a contract with an alarm company to monitor the alarm and because of previous false alarms, the company was instructed not to call the fire department and they were instructed to call facility maintenance personnel. The alarm company called the maintenance person they were instructed to call and since he was away over the weekend, they left a message on the facility maintenance manager's phone after hours on Friday evening. The pump ran with very little flow over the next several hours and the resulting heat build-up caused the thermal relief valve on the pump casing to discharge a high volume of water in the below grade pump room. The discharge rate overwhelmed the sump pump and when the water level rose to the level of the pump controllers it shorted out and eventually the room was completely submerged in water. All pump and control related equipment and electrical switchgear was submerged and had to be replaced. The failure was the result of very old corroding fire main piping in the underground fire protection loop around the building. A recommendation was made to begin replacing the fire protection main to prevent future reoccurrences and a recommendation was made have the alarm company contact the fire department or a responsible person that acknowledges the problem and not to simply leave a message on an answering machine when there was an alarm in the future.

Scald Investigation

Davis vs. Saperstein Case - Detroit, MI. Child was scalded in bathtub. No anti-scald devices were present. Unlicensed maintenance personnel replaced the water heaters with new smaller water heaters and the resulting lack of hot water caused the unqualified main to increase the hot water delivery temperatures to compensate for the new undersized equipment. This led to the severe scalding of a young boy in a bathtub.

Scald Investigation

Elstone vs. Meadows Case - Westland, MI, Improper piping installation by a contractor caused a scalding incident that eventually led to the death of two people. This case was over two years old when Mr. George became involved and he solved the case within a few weeks. Six other experts missed several obvious clues that there were piping changes. The clues confirmed the anomalies that were described as occurring with the plumbing system. Circulating pumps were failing in very short periods of time and complaints of hot water system temperatures being too hot or too cold led Mr. George to look for clues that the hot water return piping, after the circulating pump, was installed wrong. The piping clues were there. That caused Mr. George to investigate further and find changes to the piping system were made under fraudulent pretenses to cover up the piping errors. The other experts on the case had been referencing an article in Plumbing Engineer Magazine that Mr. George wrote prior to the incident that addressed problems with maintaining the hot water temperature with an oversized thermostatic mixing valve. The attorney for the facility decided to contact Mr. George to ask a few questions and to get a second opinion. It turned out it was not an oversized mixing valve, because the mixing valve was re-circulated and piped properly upon Mr. George's inspection. The clues and subsequent investigation led to discovery that a contractor had improperly piped the Hot water system

during a renovation prior to the incident so that the mixing valve could not control the temperature when there was no usage in the system. The contractor realized the mistake after someone was scalded to death and the system was still experiencing significant temperature fluctuation problems so the contractor called the manufacturer's representative for the mixing valve to inquire about the situation. The mixing valve manufacturer's representative explained how the piping arrangement should be done to allow mixing when there is no flow in the system and to prevent scalding and thermal shock. The contractor realized that his piping arrangement was not done per the mixing valve manufacturers printed installation instructions and that the piping arrangement had led to the scalding injury and a subsequent death because of the improper piping arrangement. The contractor then tried to cover his tracks by contacting the facility and claiming the mixing valve was defective and they should hire him to shut down the hot water system overnight so he could replace the defective thermal element in the mixing valve. While the system was shut down the contractor did not replace the thermal element in the valve, he revised the hot water recirculation piping. This act constituted fraud when it was discovered the mixing valve still had original serial number on the thermal element or thermal motor and the HW circulating piping was revised. Mr. George discovered the re-circulating piping was revised after the scald incident because of the manufacturing dates on the revised piping. Other clues were: discolorations at specific solder joints where the new tie-ins were made and the revided piping had uniform pricing code stickers from a local hardware store where the date of the piping purchase could be traced to the revised piping and capped piping connections where the revisions were made. There were numerous clues that led Mr. George to investigate the dates on the revised piping and it showed the recirculation piping was manufactured and installed after the original scald incident. There was a very large settlement for this case and the family of the deceased made a donation to the University of Michigan Burn Center in memory of their father, Emil Melaniak, who tragically died as a result of scald burns he received from the improper piping arrangement. The family wanted to help prevent this from occurring again.. The University of Michigan Hospital Burn Center used the donation to create and help fund a website with information on scald burn prevention. Mr. George was subsequently hired by the University of Michigan to prepare a report with material and suggestions for scald burn prevention for the U of M Burn Center web site. Eventually Mr. George was hired by and consulted for the opposing counsel in subsequent scald cases.

Scald Investigation
Fu vs. Washington, Univ. – St. Louis, MO, A University Professor was scalded from an epileptic seizure that occurred because of exposure to a sudden temperature change in shower. Upon collapsing his toddler son tried to turn off the water and could only reach the cold water valve. No scald protection in the form of a master thermostatic mixing valve or an anti-scald valve, or any other means of scald protection was in place in the University Housing building tub/Shower Unit.

Combined Domestic Hot Water & Heating Water System Failure
The Grand Apartment Building - N. Bethesda, MD, improper piping caused/product failure. A design build contractor decided to combing separate domestic hot water and heating hot water system to save money on a high rise condominium building project. This created combined heating & domestic hot water system. There were numerous problems with materials, pipe sizing, code compliance, manufacturer's warranties and liability issues associated with this system. Mr. George prepared a report listing the many systems design problems, manufacturer warranty violations and code violations and liability issues along with recommendations for corrective action.

Water Hammer Investigation
A Contractor closing a quick operating fill valve on tanker truck caused a water hammer shock wave that travelled back through the water main and ruptured the water service piping at a nearby home. The resulting piping rupture caused significant water damage and foundation damage to the home. Mr. George provided an oral report of his opinions of the cause of the incident – California

Lack of Hot Water at a shower
Mr. George was asked to investigate why a homeowner could feel hot water at the water heater and at nearby fixtures and the homeowner could not get hot water at the master bathroom shower on the other end of his home. Upon investigation, it was discovered the homeowner had underground plumbing and because the home was located in Phoenix, Arizona, the homeowner felt he did not need piping insulation on the underground piping. Mr. George explained that without insulation the 1/2 inch copper water pipe that was in contact with almost 100 feet of sand/soil underground was loosing most of its heat to the ground and what he had was similar to a floor warming system. Mr. George recommended corrective actions.

Plumbing System Drainage Problems with a renovation project which installed low flow fixtures in an existing building.
Mr George was asked to investigate drainage problems with a 73-story high rise major hotel that was experiencing major drain blockages after a renovation project that installed low flow fixtures. The facility maintenance manger said prior to the renovation on a typical morning when the hotel was at maximum occupancy they would have one staff plumber working full time to unclog water closets. After the renovation project they found that the number of clogged toilet calls increased significantly to the point that they had to hire more plumbers to handle the increased volume of plugged toilets during maximum occupancy periods. Mr George was hired by the hotel chain to performed testing of the drainage system to determine if the problem was caused by the piping system or the pressure fluctuations within the stack of the high rise building. The investigation found the branch piping and system pressures were within acceptable limits in the codes. Mr. George found that some models of the old water closets (prior to the renovation project) were still in the basement along with some spare models of the new water

closets. Mr. George proposed to have testing done to compare the performance of the old water closets to the new water closets. He developed a testing protocol in accordance with ASME Standards to the have the fixtures tested through an independent testing laboratory. The testing showed the newer units met the ASME standard, but had poor flushing performance compared to the older model water closets. The hotel negotiated with the fixture manufacturer to have all of the fixtures replaced on a floor by floor basis. Major hotel in Detroit, MI

Plumbing System Investigation
Flooding was occurring in a lobby and several other areas of a new high-rise building complex for a computer software company corporate headquarters building. Mr. George's investigation revealed there were miscellaneous plumbing contractor sizing problems and there was a house trap prior to the storm drain connection to a combined sewer. Mr George gave a report recommending changing some pipe sizes and adding a vent to the inlet of the house trap to prevent the drain from air binding when the drain was operating at full flow during storm events. – Detroit, MI

Scald Investigation
Child Scalded, Stadium Apartments, Ann Arbor, MI, A University of Michigan student was living in an Apartment with her infant child. There was no air-conditioning in the apartment and on a hot summer day the child became agitated because of the heat and began crying. The mother went into the bathroom, placed the child in the bathroom lavatory and she began to run cool water over the baby and she began washing him with a wet washcloth to cool and sooth the infant. While sitting in the lavatory under the flow of water, the child reached over and grabbed the lavatory faucet handle and pulled it to the hot position causing extremely hot water to come out of the faucet causing severe burns over the childs lower torso. Mr George inspected the facility and found numerous code violations including: No door or lock on the water heater room where anyone in the building had access to all of the water heater controls, several water heaters were missing the thermostat control knob, one of the four water heaters was venting combustion products inside the laundry room of the building, and the water heaters were set to a temperature that allowed hot water temperatures that were measured by Mr. George as high as 167 degrees F in the apartment with no thermostatic controls at the water heater and no anti-scald valves at any fixtures in the apartments.

Scald Investigation
Williams vs Heatherwood Apartments, Inkster, MI. Child scalded in tub no anti-scald devices were installed.

Scald Investigation
Kathleen Merritt vs First Housing Corp. Disabled person scalded in a barrier-free tub/shower unit. There was an anti-scald shower valve in the apartment, but it was not set by the installing contractor. Mr. Georges investigation showed the oxidation on the maximum temperature limit stop set screw indicated the valve had never been set to limit the hot water temperature to a maximum of 120 degrees as required by code.

Scald Investigation
Genesan Muthusburamanian scald Case, Dearborn, MI Apartments, Adult male fainted in shower and he was scalded when he grabbed at the shower controls on the way down. No temperature controls or anti-scald valve in place.

Scald Investigation
Kings Lane Apartments, Burton, MI, Child scalded in bathtub. A combined heating hot water system and domestic hot water system coupled with undersized water heaters led to a shortage of hot water on cold winter mornings during peak heating season. The lack of hot water and building heat in the combined system caused maintenance personnel to increase the boiler temperatures and the water heater storage temperatures to compensate for the undersized heating equipment. The installation of the indirect water heaters also allowed the water heaters to exceed the set point on the thermostat because of a control wiring and piping error. This caused the hot water temperatures to become excessive when the building heating hot water demand was not there. A toddler was scalded while bathing when water approaching 170 degrees F entered the bathtub.

Scald Investigation
Hotel in Jacksonville Fla. Scald case. An adult male had an Epileptic seizure in shower. The seizure may have been triggered by thermal shock in the shower causing him to faint and grab the shower controls on the way down. There was an anti-scald valve installed in the shower, but the victim was scalded with anti-scald valve in place because it had not been set by the installing contractor or seasonally adjusted by building maintenance personnel as required by the manufacturer of the valve.

Water Leak Investigation – Thermal Expansion
An automotive manufacturing facility had recently updated the employee toilet facilities and soon after the renovation the building maintenance personnel noticed water on the floor near the water heater relief valve discharge pipe termination. The maintenance personnel blamed the leak on a faulty relief valve and asked the water heater manufacturer to replace the valve. After replacing the relief valve the discharge continued so Mr. George was asked to investigate he determined that the water heater and relief valve were working fine and that the system had a reduced pressure backflow preventer and there was no thermal expansion tank on the domestic hot water system as required by the plumbing code. The backflow preventer created a closed plumbing system where pressure would increase dramatically when the water heater burner cycled after each break. Mr

George found that the facilities assembly line would stop several times during the day to allow assembly line workers to have breaks and lunch periods. During each break there was a significant usage of hot water for hand washing during each break. The water heater experienced a significant draw of hot water from the tank which was replaced by incoming cold water. Upon resumption of the assembly line work there was no usage of hot water and the water heater burner came on heating up the 38 degree cold water to 140 degrees. The resulting thermal expansion of the cold water caused the pressure to build in the ho water system and the temperature and pressure (T&P) relief valve would discharge a small amount of water onto the floor. The Plumbing code required a maximum pressure of 80 pounds per square inch (PSI) in the plumbing system and it required a means of reliving thermal expansion. The relief valve was discharging at 150 PSI. The solution is to provide a thermal expansion tank sized to allow for thermal expansion to occur while keeping the system pressure below 80 PSI and to preventing the T&P relief valve from discharging. The solution was to add a properly sized thermal expansion tank to the cold water side of the water heater. Automotive Assembly Plant – Detroit, Michigan

Product Failure/ Thermal expansion Water Leak, Water Damage Investigation
Photo Processing Facility, Rockville, MD
Water Leak from a burst pipe/Water Damage – Mr. George was asked to investigate an incident where a water pipe burst and caused a significant financial loss from damages to a photo processing building and its contents. Mr. George investigated on behalf of a valve manufacturer who was the defendant as the insurance company was going after subrogation from the valve manufacturer because the pipe that burst was in the valve manufacturer's valve control cabinet. Mr George determined the water damage was because of the lack of a thermal expansion tank and water hammer arrestors in the system. The investigation revealed numerous plumbing system alterations that were made by an unlicensed facility maintenance worker that were not done in accordance with good engineering practice and not installed per the plumbing code. The similar piece of pipe was tested and found to burst at about 1,100 PSI. The report revealed that thermal expansion events had been occurring on a regular basis based on water stains and calcium build-up on the floor at each T&P relief valve. The relief valves had scaled over and become inoperable because of hard water in the facility. The pressure relief valves were no longer operational. A hurricane and associated storm system passed over the area causing power outages over a holiday weekend. Upon restoration of power, the water heaters experienced a significant thermal expansion event causing the pipe to burst. The case was dismissed at trial when it was pointed out the maximum allowable pressure in the plumbing system is 80 PSI and the material expert fore the insurance company could not give a technical reason for why he felt another pipe material should have been used in spite of his own testing showing a bust pressure significantly higher than 80 PSI.

Plumbing Product False Advertising Claim
Mr George was asked to give his opinion of a manufacturer's advertising claim after review of product and review of the performance of the product for a false advertising lawsuit of one manufacturer vs. another.

Furnace Explosion Investigation
Furnace Explosion and fire injured a worker. Mr George investigated a rotating air furnace in automobile insulation manufacturing facility in Ohio. Mr. George found that there was no preventative maintenance program in place and the maintenance was done on an emergency basis. According to maintenance records and depositions they would wait until something broke before attempting any repairs. This caused the maintenance people to hold up production and on one occasion a burner safety control was bypassed with a jumper wire in order to keep the facility on line. This eventually led to an explosion and fire that severely injured a worker. OSHA investigated and cited for manufacturer by-passing safety controls at an automotive Insulation Manufacturing facility in Ohio. Mr. George's report showed that the lack of routine maintenance allowed the combustion air inlet to become clogged with insulation debris from the manufacturing process and the safety switch was by-passed and allowed the continued burner ignition cycle. When the pressure sensor for the fan proving switch was by-passed it did not interrupt the combustion start-up sequence as it should have and the fuel gas solenoid continued operating as if nothing was wrong. Area factory workers noted small whiffs of fire and black smoke emitting from the top of the factory heating furnace on several occasions during ignition prior to the accident. This was because with the combustion air inlet was clogged up there was an extremely rich gas mixture in the combustion chamber. The rich flame caused the inspection port to become sooty from combustion that was too rich. When workers in the area called maintenance because of the smell of gas when it was too rich to burn. The maintenance worker sent to investigate the furnace was burned by the explosion and fire. He was thrown about 8 feet onto some nearby assembly line racks after he climbed up on the furnace and opened the inspection port to view the burner assembly. Opening the viewport door allowed air to the rich fuel gas mixture. The worker was airlifted to an area burn center.

Cross-Linked Polyethylene PEX Pipe Fitting failures
Investigation of a failure of PEX pipe fittings at a condominium complex in Oakland, County, Michigan.
Investigation revealed an inferior non-code cast brass fitting was used which caused numerous fitting failures throughout the complex. The fitting manufacturer agreed to pay for replacement fitting and the cost of all labor for repairs. The fittings appeared to be from a batch of bad fittings where there was apparently a metallurgical problem with that batch of fittings. Replacement fittings were forged brass and plastic fittings.

Gas exposure from an appliance pilot
Apartment Building New York, NY.

Nursing Home Patient - Base Board heater exposure burn
Nursing Home in Ohio.

Construction Payment Dispute
Architect/ Owner/ Contractor dispute over a construction delay, Detroit, MI

Scald Case
Nursing Home, San Mateo, CA

House Fire Investigation
Investigation into the possible cause of a house fire, Lake Charlevoix, MI

Construction Accident Investigation & Report
Investigation into a plumbing related construction accident, Chicago, IL

House Explosion & Fire
Investigation of a propane gas explosion & fire that resulted in one death & one serious injury to another, New Braunfels, TX

Nursing Home Hot Water System Investigation & Report
Macomb, MI

Scald Investigation
3 year old child scalded over 50 percent of his body in a bathtub without proper temperature controls. Apartment Building, Boston, MA

Steam Scald Case
A customer at a health club was severely scalded when he passed out in the steam room due to high temperature. Mr. George investigated an found that there was no temperature sensor or automatic temperature control valve serving the steam room. The only controls on the industrial heating boiler steam piping serving the steam room were the pressure controls on the discharge header for controlling the steam boiler burner and a manual shut-off valve.

Pipe Explosion/Injury Investigation
Investigation into a Plastic pipe explosion that severely injured a worker when the plastic pipe was filled with compressed air and it exploded. Beaumont, Texas.

Scald Investigation
Scald of an elderly tenant in a Seniors Apartment Building, Fort Worth, TX

Scald Investigation
Scald Death of an 8 year old girl in the State of Georgia - Capital Murder Case

Scald Investigation
Scald investigation of a teenage girl who suffered an epileptic seizure in a shower and was scalded. No- anti-scald valve installed on the tub/shower and no thermostatic mixing valve installed on the water heater. San Antonio, TX

Code Investigation/Product Evaluation
Investigation of a floor mounted water closet fixture to wall connection. for a manufacturer of a water closet. A fixture manufacturer developed a push-on type water closet connection to the drainage system. Mr. George provided a report covering the code equivalence for this type of joint.

Water Damage Investigation
Investigation and report on a sewage backup incident in the basement of a residence which was caused by a water utility contractor crushing a plastic building sewer line. The damage occurred while the contractor was working on repairs to a building water service pipe nearby. The resulting damage to the sewer caused significant sewage back-up into the home and subsequent mold damage and physical ailments to the occupants.