Benjamin Casey, PE, CPP, PSP, *DBIA, MBA

Principal

JURISDICTIONAL LICENSES

Professional Engineer (PE):

CA, DC, DE, GA, IL, LA, MD, MN, NJ, NY, PA, TX, VA… *add'l available upon request*

BOARD CERTIFICATIONS

ASIS International:
Physical Security Professional (PSP),
Certified Protection Professional (CPP)

Design-Build Institute of America:
A&E Professional *Associate (DBIA)

HIGHER EDUCATION

BS, Fire Protection Engineering,
University of Maryland, 2004

MBA, Management focus,
Tulane University, 2022

PROFESSIONAL AFFILIATIONS

(DBIA) The Design-Build Institute of America

(SAME) Society of American Military Engineers

NAIOP Commercial Real Estate Development Association

(APTA) American Public Transportation Association

(NFPA) National Fire Protection Association, Member

(ASIS) American Society for Industrial Security, Member

(SFPE) Society of Fire Protection Engineers, Professional Member

(SMPS) Society for Marketing Professional Services, Member

(ICC) International Code Council, Building Safety Professional Member

SECURITY CLEARANCES

Type/Status Available Upon Request

YEARS OF EXPERIENCE

Total with All Firms ~ 23

INTRODUCTION & BACKGROUND

Benjamin Casey is an executive leader who originally founded CODEX Engineering in 2011. Since that time, he has also accepted ownership stakes in multiple other large Architecture/Engineering (AE) firms; and as a shareholder he was tapped to develop new offices, departments, and practices during his tenure. With each executive undertaking, he always maintained focus on his primary firm's day-to-day operations and strategy. His technical background of core expertise developed prior to his most current multi-disciplinary AE firmwide principal oversight roles; is in fire protection, security, code, resiliency/risk, and AE+Construction (AEC) industry M&A or management consulting. Also, under prior AE firm positions, he was a Vice President overseeing all markets and service lines within the Southcentral Region of North America and global Practice Leader for the government and transit markets. Mr. Casey has an extensive background as a building engineering project/program manager overseeing multi-discipline design scopes, facility condition assessments, construction administration, and risk-based hazardous materials analysis. His areas of personal design and consulting expertise include building, fire, and life safety code analysis or performance-based design; fire protection systems design, from sprinkler and detection to special hazard systems with gaseous suppression and air-aspirating detection or video sensor analytics; construction equivalency/engineering judgements and site-wide strategic planning; safety systems testing. When it comes to his personal background in Security integration; he has extensive experience with intelligent/AI video surveillance, access control, and intrusion detection… plus associated threat and vulnerability assessments; mass notification and central monitoring center design including fiber and copper networking in addition to planning/implementing a holistic physical security posture for client assets. As far as project market sectors (verticals) are concerned, Benjamin's expertise ranges widely as he's engaged whenever complex risk-based engineered systems or unique solutions are needed – including everything from data centers and SCIFs, to labs and hospitals, to historic and cultural institutions, to new cutting-edge tech for industrial/manufacturing and petroleum/alternative energy plus supporting the resurgence of nuclear.

ARTICLES, AWARDS & COMMITTEES

Mr. Casey's latest achievement was receiving the highest Award of Excellence by the Society for Marketing Professional Services (SMPS) national organization for his development of a new "Resilience Planning & Practice Brochure" to anchor his efforts forming the new nationwide multi-disciplinary Resilience Practice for a large AE firm – the firm brought him in to complete the practice build-out; which he accomplished in under two years. Mr. Casey served on the technical committee developing the Standard on Aircraft Maintenance, NFPA 410, for the National Fire Protection Association which develops standards for safety of airports and all other types of facilities. He also served via The American Institute of Architects (AIA) Board selection on the Mechanical Engineering Review

Benjamin Casey's LinkedIn Profile

https://www.linkedin.com/in/benjamin-casey-77272a1

PROFESSIONAL HISTORY

05/2011 – Present
CODEX Engineering,
Principal, Founder

08/2022 – Present
Thibodeaux Consulting Group (TCG),
Principal, Co-Founder

09/2024 – 08/2025
Professional Loss Control (PLC),
Principal, Vice President of US Operations

01/2023 – 06/2024
Hammel, Green & Abrahamson (HGA),
Principal, Engineering
// Resilience Practice Leader

02/2016 - 01/2022
JENSEN HUGHES,
Vice President, Southcentral Region
// Practice Leader (Government // Transit)
// Office Director

12/2012 - 02/2016
AECOM,
Deputy Director of Business Development
// Department Manager

07/2005 - 05/2011
The Protection Engineering Group (PEG),
Engineering Project Manager

01/2005 - 07/2005
Life Safety Solutions Integrators (LSSI),
Low Voltage Systems Design-Builder

05/2004 - 08/2004
Edwards Systems Technology (EST),
Fire & Security Systems Design-Builder

05/2003 - 08/2003
Remington & Vernick Engineers (RVE),
MEP Systems Designer

Committee (MERC) updating MasterSpec's globally-adopted template fire protection specifications. He accepted the Gold Chapter Excellence Award two years in a row for his role as Vice President of the SFPE, Chesapeake Chapter, and was an active Board Member in the ASIS, National Capital Chapter. He published his first article entitled "Mass Notification Systems: Approaching Critical Mass" on the history, strategy, regulations, and future of emergency communications systems for higher-ed and federal facilities. As an early-adopter of video imaging detection technology, Mr. Casey presented his cutting-edge video image-based fire/smoke detection system design to the fire protection community along with the technology's inventors. He developed and organized a special seminar that included presentations and a tradeshow for the Association for Preservation Technology entitled "Fire Protection for Historic Buildings: Modern Technology Meets Historic Fabric". Along with the electrical contractor, Mr. Casey accepted a Craftsmanship Award from the Washington Building Congress as engineer in charge of the Inter-American Development Bank Headquarters Fire Alarm Replacement project. More recently, he achieved the highest "Award of Excellence" by SMPS National for a new long-form brochure booklet and marketing materials he created to anchor his efforts developing a new nationwide multi-discipline Resilience Practice for a large AE firm. Presently he hosts the Fire Protection Engineering Podcast he founded in 2024 – interviewing industry experts to give back to the building safety community within which he has spent a tireless career of service.

PROJECT EXPERIENCE

<>~<> B.Casey's Career-Spanning Major Past Project Roles <>~<>

Teleflex, Fire and Life Safety Risk/Hazard/Emergency Assessments, Five USA Sites in GA, CT, NH, MA, MS.
Engineering Principal-In-Charge and senior solutions analyst for unique/complex technical challenges at each site. The Teleflex manufacturing company facilities consist of buildings of varying size, function, and risk profile but all are involved in the manufacturing process, or warehousing/logistics hubs, and therefore must be evaluated as a complex working unit in order to determine hazards, risks, and mitigation options for a holistic set of fire and life safety recommendations. Greater focus and time was spent assessing the buildings which pose a greater risk of large-loss events or those that contain high-hazard substances and dangerous processes while others may were addressed with a brief walk-through along with digital image documentation and notes on existing as-built record documents, provided by the owner-client prior to arrival. The objective of my involvement was to analyze potential fire events and assess the current manufacturing designs against the latest fire protection codes and standards. Paying particular attention to the major process and storage hazards, including the history of fires at this or similar industrial manufacturing facilities, the goal of identifying the high-risk areas and recommending improvements to reduce fire frequency or potential fire consequences in those worst-case areas, was most effectively completed. In general, Teleflex was looking for a review of their processes and facilities to address the following three elements:

TECHNICAL TRAINING

SYSTEMS MANUFACTURERS INSTALLATION & PROGRAMMING

GE Infrastructure Security
Tyco Fire & Security
Honeywell Life Safety
Gorman-Rupp Patterson Fire Pumps
Notifier Fire Alarm & Mass Notification

LEGAL EXPERT & ACTING AUTHORITY HAVING JURISDICTION (AHJ)

DC, DCRA Third-Party Inspections Program, Fire Inspector
Maryland, PG County Fire and Life Safety Office Third-Party Inspection Program, Fire Protection Consultant
Maryland, Office of the State Fire Marshal, Event Crowd Manager
Virginia, Bureau of Capital Outlay Management (BCOM), Construction and Professional Services Manual (CPSM)
Nationwide AIA Disaster Assistance, Safety Assessment Program (SAP), Building Evaluator
Lawline Continuing Legal Education (CLE), The Art of Cross Examination

ENGINEERING DESIGN SOFTWARE

Autodesk, AutoCAD & Revit
Bently, MicroStation
SpecsIntact, DoD UFGS
MasterWorks, AIA MasterSpec

EGRESS, SMOKE, FIRE CFD MODELING & HYDRAULICS

CFD, Fire Dynamics Simulator (FDS)
CFAST
DETACT
Pathfinder
HydraCAD
HASS
THE Sprinkler Design

FACILITY ASSESSMENT, PLANNING, MANAGEMENT & COST ESTIMATING

VFA.facility
Microsoft Project
Apple Tap Forms
RSMeans

1. Identify any fire-related hazards;
2. Identify any associated noncompliance with state, federal and local applicable fire safety regulations and;
3. Provide a documented report of identified fire-hazards, non-compliant practices, and suggested mitigation measures / best practices to reduce risk. The goal was to confirm compliance or identify findings with current fire protection industry codes (adopted as law in the State/City/County) and appropriate standards-of-care/best-practice-guides, including but not limited to: Life Safety Code (state adopted edition with local Amendments); International Building Code (IBC) (state adopted edition with local Amendments); International Fire Code (IFC) (state adopted edition with local Amendments); National Fire Protection Association (NFPA) Standards applicable to present hazards; Any local County or City Ordinances, or if outside the United States, Country-specific codes; and FM Global Insurance (their commercial insurer) guidelines and requirements. [Estimated Assessment Scope Completion 2026. Estimated Assessment Fee $45,000].

Rosemount Certification Lab Performance-Based-Design of Deflagration Venting Alternatives, Eden Prairie, MN.
Engineering Principals-In-Charge of Explosion Prevention related engineering services which could result in a varying range of outcomes consisting of recommendations for a path forward to our client's multi-disciplinary project team; including basic prescriptive-design strategy guidance and Quality Control support… Or proceed to any number of advanced performance-based-design levels of effort. My subconsultant explosion/deflagration prevention engineering team proceeded with the following 4-step process:
1. Review of the deflagration venting preliminary analyses already completed by the client's internal fire protection team;
2. Determine and analyze all available options to design a code compliant facility (including guidance on NFPA 68/69 prescriptive standards on explosion prevention).
3. Conduct an Engineering Judgement analysis for Authority Having Jurisdiction (AHJ) approval to proceed with a performance-based-design Alternative Solution;
4. Provide further consultations, deliverables, surveys, or meetings with project stakeholders (either internal or external to the client's project multi-disciplinary AE team) that request information related to the Alternative Solution or any other deflagration/explosion prevention related guidance derived from the performance-based-design solution proposed to adequately protect the facility from deflagration/explosion hazards to an acceptable level of safety and industry standard-of-care. [Estimated Explosion Prevention Scope Completion 2026. Estimated Explosion Prevention Engineering Fee (all Steps) $40,000].

Nucleus RadioPharma Manufacturing Bldg 14B Tenant Improvements, Philadelphia, PA.
Engineering Principal-In-Charge of Nuclear Fire Protection (fire protection related to nuclear requirements only); scoped to facilitate a fire risk assessment for the prime client's multi-disciplinary project team for this Radiopharmaceutical company. Our subconsultant fire protection nuclear engineering staff conducted a workshop meeting with the client representatives including all affected client team disciplines along with the owner's representatives. During this workshop, we lead the group in a

visualization – walking through of fire scenarios and risk mitigation procedures for different areas of the facility. The group discussed our pre-workshop research in hazards/regulations, historical incidents/responses, and owner stakeholder needs/objectives. Post-workshop, we produced a tabularized report deliverable that includes recommendations based on the pre-workshop research coupled with workshop conclusions and project design documentation analysis against applicable codes, standards, and best practices for fire protection of nuclear facilities. [Estimated Nuclear Fire Protection Scope Completion 2026. Estimated Nuclear Fire Protection Engineering Fee $19,000].

JD Irving Tissue, Post Event Analysis & Fire Safety Risk Assessment, Macon, GE.
Principal Fire Protection Engineer providing the fire protection engineering strategy development and oversight of assessment and risk analysis services. The objective of our involvement was to analyze the two fire events that occurred at the tissue plant during the last week of November of 2024 and assess the current plant designs against the latest fire protection codes and standards. Particular attention was paid to the major process and storage hazards, and the history of fires at this plant to identify the high-risk areas and recommended improvements to reduce fire frequency or potential fire consequences. The goal was to confirm compliance or identify findings with current fire protection industry codes (applicable in the State of Georgia and Macon-Bibb County) and appropriate standards-of-care/best-practice-guides such as: NFPA 101, Life Safety Code, 2021 Edition; International Building Code (IBC), 2018 Edition (with Georgia Amendments); International Fire Code (IFC), 2018 Edition (with Georgia Amendments); Factory Mutual Loss Prevention Datasheets (FM) applicable to the tissue manufacturing process equipment and storage hazards, and National Fire Protection Association (NFPA) Standards applicable to the hazards. [Estimated Fire Protection Engineering Scope Completion 2025. Estimated Assessment & Associated Recommendation Implementation Fee $90,000].

FEMA, Hurricane Milton Emergency Response, Various Cities, FL.
Engineering Principal providing on-call emergency response consulting services (i.e., Resilience Planning and Consulting) to our client, a prime federal contract holder providing post-disaster services for this Hurricane Milton Emergency Response effort located in the State of Florida, and potentially surrounding areas, based on the hurricane's final track. My resilience planning portion of the scope of services involved completing a hurricane emergency response operations analysis; then implementing the recommendations of the analysis for all associated emergency response review and administration support services. These services were based on the requirements of the codes and standards adopted within the State of Florida and other emergency response best practices and guidelines. Also, a remote assessment of the proposed operations, planning, and administration documentation was provided along with support related to prioritization of activities post-event. These efforts were designed to assist the client in oversight of their hurricane response mobilization activities. [Estimated Emergency Response/Resilience Planning Scope Completion 2025. Estimated Resilience Planning Fee $10,000].

Various AEC Firms & Private Equity Investor Groups, USA & Europe.

AEC Industry Management Consultant responsible for services to private equity, investment brokerage, and large AEC corporations interested in Mergers and Acquisitions (M&A). Typical task-order-type projects included providing novel insight on trends, strategies, and forecasting using our proprietary data and experience. We provide an acquisition competitive edge involving our firm principals providing intuition-based guidance for varying topics that were developed over years of hands-on experience; including those related to our core services of safety, fire, security, and resilience. For each unique client consultation, I developed an overall picture to illustrate market dynamics and operational structures; then zoomed-in to target the firm's key performance indicators for a tailored financial analysis based on microeconomics concepts effecting the diverse sectors within the market areas in question. When covering macroeconomic trends based on my pragmatic industry experiences, I speculatively provided growth or loss viability due to perceived tailwinds or headwinds. To reiterate, these opinions of operational dynamics are requested to help the client develop a unique picture that can't be gleaned from internet sources or textbooks, including past examples of cultural in-house firm-specific shifts vs. industry-wide cultural dynamics. In the last phase of the consultations, we typically discussed strategic initiatives around forecasting and positioning for the greatest growth potential using our firm's own previously compiled internal and external research on horizontal services' trends, vertical market sectors' trends, and associated pros/cons for the future of each. The engagements typically concluded for a short period of days or even hours until contacted for post-interview follow-up and requests for additional clarifications on a specific topic or to cover something previously overlooked. A few longer-term clients requested continued periodic engagement for their due diligence procedures throughout the progressive final stages of investment/acquisition completion. [Management Consulting has been ongoing annually since 2023. Estimated Management Consulting Annual Fee for all combined contracts/tasks $18,000].

Versiti, Blood Research Institute Expansion, Milwaukee, WI.
Engineering Principal for Quality Control/Assurance and Lead Engineering Design Principal responsible for building code compliance for all A&E disciplines and leading the design of new fire protection and fire alarm systems. The scope of work for this project includes the addition of a new four-story laboratory and office building for Versiti's new blood research institute as well as renovations to their existing offices space on the first three floors of their adjacent office building. The fire protection scope of work includes the design of a new fire suppression system to cover the new building as well as outlining the new and demolition scope of work for the existing office spaces. The fire alarm scope of work included the addition of a new addressable fire alarm system in the new building as well as creating a new fire alarm design in the renovation. The deliverables in this project include specifications, drawings, narratives and all necessary reports for compliance with all building code requirements. Special hazards systems and detailed insurance-related chemical hazard criteria had to be adhered to throughout the design process and final construction documents. [Estimated Construction Completion Date 2025]

The Salvation Army, Adult Rehabilitation Center (TSA), Chicago, IL.
Engineering Principal for Quality Control/Assurance and Lead Engineering Design Principal overseeing building code compliance for all A&E

disciplines and fire protection engineering design (alarm and suppression). This project involved renovation of an existing three-story (plus basement) mixed occupancy, to provide for an addressable fire alarm system and wet sprinkler system to meet NFPA and the city of Chicago building code and fire code. Smoke alarms were provided in sleeping units. The system included connections to sprinkler system and HVAC equipment. An approved automatic sprinkler system is provided throughout the premises to comply with requirements of the city of Chicago's unique building codes. The fire protection design included installation of a new fire pump that will serve standpipes, wet sprinkler systems, and dry sprinkler systems within the building.

UC Davis Medical Center, ACC & Eyecare Center Fire Alarm Upgrade, Sacramento, CA.
Principal Engineer and Project Manager responsible for UCDH Ambulatory Care Center Fire Alarm System Upgrade – Project mainly consisted of Architecture and Engineering services related to code and signaling smoke zone upgrades encompassing the goal of a Fire Alarm System Upgrade at the ACC building on the UC Davis Health campus in Sacramento, California. The project's primary objective was upgrading the existing ACC building to an Emergency Voice / Alarm Communication fire alarm system for defend-in-place notification, as well as providing smoke compartmentation throughout the building and associated life safety, architecture, and mechanical upgrades to support that defend-in-place response. My team and I provided life safety / code consulting, fire alarm engineering, and site investigation work for the project.
[Estimated AE bridging-document design scope completion 2023].

US Customs and Border Protection (GSA), Grand Portage Land Port of Entry, Grand Portage, MN (Indian Reservation).
Senior Fire Protection Engineer responsible for developing the Fire Protection / Life Safety Scope of Work and Program Development for the Grand Portage LPOE project in Grand Portage, Minnesota. The project will provide a new land port facility to replace the existing facility on the United States side of the US / Canada border, totaling approximately 48,000 SF of new building area. The new facility will include a Main Port Building, Secondary Inspection and Hard Inspection space, Commercial Inspection Building, inbound/outbound inspection drive lanes, other inspection-related areas, work/office spaces for government personnel. The fire protection scope of work includes fire alarm system design, wet-pipe and dry-pipe fire sprinkler systems design, and life safety / code analysis in accordance with the GSA P100 Facilities Standard, the LPOE Design Standard, and UFC 3-600-01, as well as coordination of applicable criteria requirements with the GSA Regional Fire Protection Engineer as the AHJ. Due to limited site water supply infrastructure, the fire sprinkler system scope includes the design and installation of on-site water tanks and a fire pump system to provide the necessary sprinkler water flow and pressure.
[Estimated AE bridging-document scope completion 2023].

Mayo Clinic, Multi-Building Campus Fire Alarm Systems Replacement, Rochester, MN.
Senior Fire Protection Engineer responsible for overseeing the fire alarm designs within three separate high-rise buildings (base scope buildings: Baldwin, Stabile, and Guggenheim) with one add-alternate building to be

determined upon analysis of the final cost estimate versus the client 2022 fiscal year budget (add-alternate building: Hilton) on the Mayo Clinic Campus located in Rochester, Minnesota. Each of the existing fire alarm systems in the buildings was nearing their end-of-useful-life expectancy. The client commissioned our combined electrical and fire protection engineering team to produce updated fire alarm designs. We field surveyed the existing fire alarm systems in each of the buildings to assess compliance and additional analysis was done to determine required quantities of initiation (detection and modules) and notification appliances (voice evac type) for the new systems. Mayo Clinic's Fire Alarm Design Guide was utilized along with compliance with the requirements of the Minnesota Building Code and referenced fire alarm system standards including NFPA 72 and NFPA 70. [Estimated AE design scope completion 2023].

Allina Health, Abbott Northwestern Hospital Surgical and Critical Care Pavilion plus Skyway, Minneapolis, MN.
Senior Fire Protection Engineer responsible for leading fire protection engineering design (alarm and suppression, as typical) and providing fire, building, and life safety code consulting to the rest of the AE team. The Hospital needed to expand their campus to serve the growing demand for private beds and procedures. The project involved adding 192 new beds, 30 new operating rooms, and almost 500,000 SF on a tight urban site constrained on three sides by existing structures and streets. To have this project be ready for the future of healthcare, the AE team established a new patient room prototype. At the direction of hospital leadership, the patient room and unit plan use the DIRTT prefabricated wall system, which is the first planned inpatient use of the product in the State. During the programming and master planning periods, our AE team tested scenarios of a single and a two-level interventional platform/Prep/Recovery to understand which one performed better against the project evaluation criteria. This industrial engineering effort quantified the efficiencies of each plan and determined a design direction which made the most sense for the client. We then took these concepts and refined the Master Plan by integrating infrastructure, structure, and connections to the campus (including a large Skyway or pedestrian walkway) for distribution of staff, material, site circulation, along with complex construction phasing. This Master Plan was then turned into the deliverable for a Basis of Design document which accurately described the scope, level of quality, level of performance, and design intent so a reliable cost and schedule could be determined and presented to the Board for funding approval. Throughout the process, a Construction Manager (CM owner's rep) worked collaboratively with our AE team to develop a continually updated schedule and cost model to use moving forward in design and construction. The CM and AE teams collaborated closely on cost, schedule, constructability, phasing, and site logistics for extremely reliable project progress estimates. [Estimated construction completion 2025. Estimated construction cost $605M].

Quantinuum, Special Hazard Fire Protection System Retrofit, Brooklyn Park, MN.
Senior Fire Protection Engineer responsible for leading design development of the VESDA air-aspirating detection and associated fire alarm system interface; with single-interlock preaction, gaseous NOVEC 1230, and Early-

Suppression-Fast Response (ESFR) fire suppression systems integrated design for a new multi-laboratory (multiple clean rooms) build-out for this technology research tenant client within an existing commercial building. The project encompassed around 77,000 cubic feet of the overall building, designed in three-dimensions via Revit throughout the process (2D PDF plots were not useful) due to the nature of the fire protection gaseous system design requirements. The client desired that the clean rooms be protected with the least risk of exposing the elements within the room to water or smoke/fire, but without increasing the risk of loss of the overall building if a major fire were to occur, which necessitated the special hazard fire protection system design and my specialized expertise and personally created design calculation tools. We provided design direction for the engineering team on clean agent product selection according to project needs and building characteristics; and consulted on fire suppression design to accommodate the retrofit and re-routing of ESFR coverage of the existing warehouse area adjacent to the new tenant space. In addition, we provided coordination efforts with local specialty fire suppression contractors to validate our design calculations and basis of design documentation for the exact proprietary clean agent system to be procured and ensured that the existing fire alarm system would properly communicate and function within the complex special hazard fire protection system's sequence of operations. We also had to analyze the proprietary fire alarm releasing panels and associated special hazard detection, notification, and control equipment to provide a design strategy for the existing building-wide fire alarm system tie-ins to the NOVEC 1230, preaction, and VESDA sub-systems. [Estimated AE design scope completion 2023].

Kaiser Permanente, Regional Laboratory Buildings 914 & 934 Renovations, Richmond, CA.
Senior Fire Protection Engineer responsible for evaluating the types and quantities of hazardous materials proposed for the newly renovated Richmond CA Regional Laboratory Buildings 914 (FF&E retrofit and partial renovation) and 934 (full renovation with use change); and subsequently for compliance with the California Building Code (CBC) and associated/adopted hazardous materials building standards. The chemical quantities were provided by the client, then we validated the classifications and summarized the quantities in tables matching the physical and health hazardous maximum allowable quantity requirements tables of the CBC. The analysis included the buildings being protected throughout with automatic sprinklers (designed as Extra Hazard Group 2, where appropriate around open chemical use) and chemicals were designed to be stored in approved safety cabinets and/or exhausted enclosures. We utilized the Control Area concept of the code to design 1-hour fire barriers and meet all other control area requirements; but allow the buildings to remain as Business-type Group B Occupancies and eliminate highly restrictive, costly, and unanticipated requirements of Hazardous Group H Occupancies. Special consideration was given to maximum allowable quantities of flammable liquids in open use versus closed-systems (after open laboratory use, chemicals were transported into waste storage via closed system processing). Lastly, because the hazardous material quantities in adjacent tenant building areas were unknown, it was recommended that the existing 1-hour fire partitions separating those areas of the building be upgraded to 1-hour fire barriers for the Laboratory use areas to remain separate. [Estimated AE scope completion 2022. Estimated Hazmat Analysis & Code Report fee $16,000].

Minnesota Army National Guard, Rosemount Armory Renovation, Rosemount, MN.
Senior Fire Protection Engineer responsible for leading fire protection engineering design (including construction administration in later phases) plus building, fire, and life safety code consulting. This AE project consisted of a complete architecture and MEP design provided for the State of Minnesota's renovation project at the Rosemount Army National Guard Armory. Our fire protection scope consisted of life safety, fire suppression, and fire alarm code compliance analysis for approximately 99,000 sq ft of renovated space. The existing armory building was analyzed per Department of Defense Building Codes, such us UFC 1-200-1, UFC 3-600-01, and UFC 4-010-01 and the state construction codes. Renovation levels were analyzed according to the square footage of the work area with total cost and potential code compliance issues noted with regard to fire separation and other life safety requirements. [Estimated AE design scope completion 2023].

University of California – San Francisco, Kalmanovitz Library Study, San Francisco, CA.
Senior Fire Protection Engineer responsible for leading the fire protection engineering strategy, including life safety code, portions of the study. This AE project consisted of a program validation study examining the renovation of the 200,000 sq ft Kalmanovitz Library for the University of California, San Francisco. The intent of the study was to determine the overall feasibility of renovating the library to accommodate the client's new needs of the existing spaces. Our fire protection scope involved preliminary review of existing systems and spaces and performing occupant load calculations to determine code compliance requirements related to life safety, fire suppression, and fire alarm. Study demonstrated an increase in occupant load which necessitated the potential addition of new stairwell to comply with egress requirements. [Estimated AE scope completion 2023].

City of Woodbury, Woodbury Central Park Complex Renovation, Woodbury, MN.
Senior Fire Protection Engineer responsible for leading fire protection engineering design (FPE typical design scope includes alarm and suppression) and providing fire, building, and life safety code consulting to the rest of the AE team. The City of Woodbury and Washington County are working with the AE team to provide consulting and design services and construction administration for the remodel of Central Park, the R.H. Stafford Library, and spaces occupied by Independent School District 833. In addition to facility upgrades that will reduce energy consumption additional enhancements include: Enhance welcoming environment of general gathering for all users; increase multi-purpose space capacity for increasing need to host larger events, meetings, and public programs for youth, teens, and seniors; more space for art-rotating art displays; expand and enhance space for Great Rivers Adult Education Consortium-English language and life skills; update accessibility/ADA throughout the facility, safety, and security, increase wayfinding, add gender neutral restrooms. Tasks included basis-of-design/program development, technical consulting, multi-discipline coordination, construction document development, project management, and construction administration. Total project consisted of renovation of an existing facility with a project area of over 58 thousand

square feet plus site elements. [Estimated construction completion 2025. Estimated construction cost $22.6M].

Fannie Mae Northern Virginia Office Complex, Technical Security Systems Design and Consulting Services, Reston, VA.
Security Principal-In-Charge working with the owner and architect to develop a technical security basis of design. The resulting basis of design was then used to develop building-wide video surveillance and access control system designs. Coordination with other design disciplines was essential for project success. Construction drawings and specifications were developed to illustrate technical security system details in a format suitable for bid solicitation. Tasks included report development, technical consulting, multi-discipline coordination, construction document development, project management. Total project consisted of two high rise towers containing an area of over one million square feet plus site elements. [Estimated design completion 2019].

BriovaRX Food & Drug Fulfillment, Fire Protection System Basis of Design and CA Services, Newark, NJ, San Antonio, TX, and Orlando, FL.
Project Manager responsible for developing fire protection basis of design, specifications and conducting a life safety review for multiple pharmaceutical warehouses containing high-piled storage. The purpose of the Basis of Design was to provide an alternative fire protection strategy to circumvent having to install a fire-pump at each facility. [03/2018 - present. Scope value $41,000.]

Boston Public Libraries – Rare Books Department Renovation, Boston, MA. Principal oversight responsible for evaluating need and producing intrusion detection, access control, surveillance system construction drawings for a high security, public facing department within the Boston Public Library. Design included public, staff, and vault level protection at different regions of the space. Project also included assessment of policies and procedures, and recommendations to provide more effective security. [Estimated completion 2018]

S9 Architecture, District Wharf Building 2, Washington DC. Project Principal responsible for QA/QC oversight of code and accessibility consulting for a new 20,000 sf mixed-use waterfront facility in Washington, DC. [Scope value $12,000, Projected Completion 2018]

FM Global, Security and Mass Notification Assessments, Singapore & Toronto, Canada. Security and fire protection lead engineer and project manager involved in the development of a security master plan and mass notification systems assessment and operational strategy. For use in a master plan for FM Global's worldwide facilities, a security assessment of the facility was conducted that addressed security management issues as well as physical and technical security elements. This assessment was used as the first building block in forming a security strategy to meet the goal of comprehensively identifying and mitigating the organization's vulnerabilities and risks. [Completion: 2018 Fire & Security Fee: $30,000]

U.S. Embassy Compound Renovation and Housing Repairs, Moscow, Russia. Project Manager for Technical Security Systems (TSS) design and

physical security consulting portion of the overall safety contract which included fire protection design and life safety code consulting. My role also involved QA/QC review and international site survey. Our team developed solutions for a compound-wide architecture and mechanical systems renovation by providing designs for the Technical Security Systems (e.g. access control, intrusion detection, CCTV) as defined by the OBO design guides. Our comprehensive safety services team supported the Architecture project team members on fire protection and security criteria standards compliance through document reviews and consultation with parallel team disciplines. [2017 – 2019 Design Period]

Global Security Assessment – Security Standards Development & Global Security Operations Center Feasibility Study, QVC Group, Westchester, PA. Security principal-in-charge including QA/QC review and oversight providing Technical Security consulting services for three security initiatives simultaneously; 1) Assessment and recommendations for security systems at global QVC facilities, 2) Develop the QVC Global Security Standards Guide, and 3) Develop the QVC Global Security Operations Center concept by providing a Feasibility Study. Tasks included coordination of internal and external resources to meet project goals, Company-wide security technology evaluation, hardware & software recommendations, and formal report development. [10/2017 – 02/2018]

Lowe Real Estate, 2415 Eisenhower Avenue Emergency Planning, Alexandria, VA. Developed and provided QA/QC review and oversight for the fire safety and emergency evacuation plan required by the Virginia State Fire Prevention Code, Section 404, for the 2415 Eisenhower Avenue mixed-use office building. The building is a high rise and is leased mainly to the National Science Foundation. The first level consists of several retail spaces and the office area's entry. The second and third levels involved a cafeteria, large conference center, and a range of smaller conference rooms, adding to the complexity of the emergency plan. Coordinated plans with the Occupant Evacuation Plan produced by the National Science Foundation location administrators. [08/2017 – present].

Quality Inn, Tysons, VA. Project principal-in-charge involving QA/QC review and oversight for the creation of life safety plan layouts and occupant load calculations for the Quality Inn, formerly Comfort Inn, in Tysons, Virginia. Directed junior staff in developing the fire safety and evacuation plan for assembly areas in the hotel, in compliance with the Fairfax County requirements [06/2017 – 08/2017].

Fallon Federal Building DOT Renovation, Baltimore MD. Project Manager responsible for code consulting, fire alarm, and fire suppression design scope for a partial building renovation at the Fallon Federal Building. Project involved survey of existing building systems including fire pump, multiple fire pump zones, and distributed transponder panels in a high-rise building. Project involved reuse of existing systems as feasible, and demolition where necessary for a GSA operated facility. [Completion 2017]

Fallon Federal Building Multiple Agency Relocation Project, Baltimore MD. Project Manager responsible for code consulting, fire alarm, and fire suppression design scope for a second partial building renovation at the Fallon Federal Building. Project involved work on multiple floors and

required phased construction. Project required working closely with GSA personnel to assure quality and timely completion. Project involved reuse of existing systems as feasible, and demolition where necessary. [Completion 2017]

Hoffman Federal Building US Marshal's Service Renovation. Project Manager responsible for code consulting, fire alarm, and fire suppression design scope for a partial building renovation at the Hoffman Federal Building. Project involved modification of incoming water supply, expanding the existing sprinkler system, and upgrading the fire alarm system in a GSA operated facility. [Completion 2017]

Fallon Federal Building Fallon Veteran's Benefits Administration, Baltimore MD. Project Manager responsible for code consulting, fire alarm, and fire suppression design scope for a partial building renovation at the Fallon Federal Building. Project involved documentation and reuse of existing systems as feasible, and demolition where necessary. [Completion 2018]

Library of Congress Fire Alarm and Sprinkler System Design, Washington, DC. Project Manager responsible for the fire alarm and sprinkler system design plus life safety code review of the Performing Arts Reading Room in the Library of Congress Building in Washington, DC. The design was based on the existing conditions and specialized media functions of the space, while providing a new addressable fire alarm system and new automatic sprinkler system layout for the renovation and architectural reorganization. [March 2017 – present].

Rotonda Condominium Association, Rotonda Condominium Garage Fire Suppression Upgrade, Tysons, VA. Principal-In-Charge responsible for Quality Control review and oversight of fire suppression design for 5, 2-story garages in Tyson's VA. Systems were both wet and dry pipe. Provided Construction period services, including creation of an RFP package, [Scope value $71,000, Projected Completion 2018]

Wharf Phase 2, Multi-Level Parking Garage & Ground Floor, Washington DC. Principal-In-Charge for security & AV Systems Consulting & Design portion of this multi-discipline project. New Security & AV Systems for the Wharf Phase 2, multi-level Parking Garage were required to be interoperable with existing Security & AV systems from Phase 1. Assessment of existing Phase 1 systems was completed prior to Phase 2 design. Phase 2 Security & AV systems included Video Surveillance, Access Control, Emergency Communication, PA System, Digital Signage and Background Music. [04/2017-present].

Trump International Hotel, Old Post Office Renovation, Washington, DC. Project engineer for large hotel renovation project for the Trump organization. Building occupancy was changed from Post Office to Hotel space for this GSA owned building. Our scope consisted of fire alarm, fire suppression and smoke control system commissioning services. [03/2016-03/2017].

Terry Sanford Federal Courthouse Security Upgrades and Military Entrance Process Renovation, Raleigh, NC. Principal-In-Charge for

various renovation projects at the Terry Sanford Federal Building in Raleigh, North Carolina. Renovations include the addition of an indoor parking space, separated corridors for federal judges, new elevators for judge and US Marshal Service (USMS) use. Designed sprinkler and fire alarm renovations in accordance with PBS-P100 and latest editions of the applicable NFPA codes and standards [02/2017-present].

HUD Fire-Life Safety Analysis of 7th and 8th Floors of Weaver Building, Washington, DC. Principal-In-Charge for the life safety analysis of renovations to the 7th and 8th floors of the United States Department of Housing and Urban Development (HUD) headquarters in southwest DC at the historic Weaver Building. Surveyed approximately 200,000 square feet of floor space for current usage and developed comprehensive life safety analysis and future planning for the total renovation of the interior of the building. [09/2016 – 11/2016]

Lexington High School Security Assessment, Lexington, MA. Principal-In-Charge overseeing the assessment of existing technical and procedural security at a high school in MA. Provided recommendations for security improvements based on PASS guidelines and negotiated feasibility with numerous stakeholders to find a workable solution. [Complete: 8/2017]

Hastings School Security Consulting, Lexington, MA. Principal-In-Charge overseeing third party security consulting for a new elementary school design in MA. Providing CPTED and technical security consulting based on PASS Guidelines. [Complete 2018]

Cabot School Security Consulting, Newton, MA. Principal-In-Charge overseeing third party security consulting for a new elementary school design in MA. Providing CPTED and technical security consulting based on PASS Guidelines. [Complete 2018]

National Museum for the American Indian, Facilities Master Plan, Washington, District of Columbia. Principal-in-Charge and QA/QC oversight for the firm's Chicago and Arlington offices combined security team to provide technical security services for the Facilities Master Plan for the Museum on the National Mall and the Cultural Resource Center. This project is a part of the task order issued from the 2014 IDIQ AE Master Planning & Multidisciplinary Solicitation for the Smithsonian Institution. The first phase of the project involved assessment of current system conditions at the two facilities, and presentation to Smithsonian stakeholders. Currently in Phase II of this project, we are developing a report which identifies and provides remediation options over a 20 year framework for facility deficiencies or changes that were discussed in Phase I. Legacy firms incorporated into my firm developed the initial security designs for these facilities more than a decade ago, and staff knowledge of the initial design has been instrumental. [Complete 2017, Security Fee: $114,000]

Quality Inn, Tysons, VA. Principal-In-Charge for the creation of life safety plan layouts and occupant load calculations for the Quality Inn, formerly Comfort Inn, in Tysons, Virginia. Directed junior staff in developing the fire safety and evacuation plan for assembly areas in the hotel, in compliance with the Fairfax County requirements [06/2017 – present].

Veterans Affairs Boston Healthcare System, Physical Security/ Emergency Management Existing Conditions Study, Various Locations, MA. Principal-In-Charge responsible for the generation of a facilities assessment report of site physical and technical security systems at 3 major VA hospital campuses in the Boston, MA region. Assessments based on review of site survey, conditions described by stakeholders, and ongoing upgrade drawings provided. This info was reviewed against the VA Physical Security Design Manual, and industry best practices, to identify deficiencies and recommend remediation. [Complete: 2017, Security Fee: $75k]

Veterans Affairs Hospital Security Concept – UMass Medical School, Worcester, MA. Principal-In-Charge for the physical security component of a concept design for the U.S. Veterans Affairs (VA) federal agency as part of a large, multidisciplinary team. Concept was a 4-story, 232,000 net square foot medical facility. Provided consultation on physical security features including standoff distance, blast analysis, and site access planning. Concept was submitted to the VA for consideration for construction and lease. [2016 Design Completion, $45,000 Security Fee]

6700 Rockledge Drive, GSA Solicitation For Offers, Fire Protection and Life Safety Evaluation, Bethesda, Maryland. Project Manager for fire protection and life safety assessment and cost estimating services performed in order to produce a report for a General Services Administration (GSA) Solicitation For Offer (SFO), using associated GSA standards including PBS-P100 and form 12000. The final report contained applicable information to offer a bid for the government to lease space in the building Transwestern manages. Also, a separate but associated cost estimate was provided for each identified deficiency in order for Transwestern to budget for future repairs. [Assessment Completion 2016; Fire Protection Fee: $4,000]

6700 Rockledge Drive GSA Solicitation For Offers, Security Evaluation, Bethesda, Maryland. Project Manager for physical and technical security assessment and cost estimating services performed to produce a report for a General Services Administration (GSA) Solicitation For Offer (SFO), using associated GSA standards including PBS-P10. The final report contained applicable information to offer a bid for the government to lease space in the building Transwestern manages. Also, a separate but associated cost estimate was provided for each identified deficiency in order for Transwestern to budget for future repairs. [Assessment Completion 2016; Security Fee: $3,750]

Pentagon Federal Bank, Tysons Overlook, Security Systems Design, Tysons, Virginia. Project Manager and lead designer responsible for the design of physical security systems for the fit out of several floors in a newly obtained high rise. Floors were corporate and commercial banking services, and included the design of intrusion detection, access control, and CCTV, and included design for panic buttons for bank teller windows. [2016 design completion, $12,524 security design fee]

Pentagon Federal Bank, Chantilly Facility, Security Systems Design, Chantilly, Virginia. Project Security Consultant, design strategy development, and QA/QC reviewer responsible for the redesign of physical

security systems for an existing datacenter and office in Chantilly Virginia. Design included addition of new intrusion detection, access control, and CCTV components to an existing system infrastructure. [Design Completion: 2016; Security Fee: $5,053]

Centurion Investments, Turnpike Distribution Center Water Supply Analysis, New Galilee, Pennsylvania. Project strategy development, QA/QC reviewer, and site assessment lead for this project to assist the new property owner with analyzing and addressing water supply issues for existing warehouse facility. Facility was protected by ESFR sprinkler system and was not receiving enough water flow or pressure for required activation duration. Evaluated existing reports from previous owner and worked with local water authority to determine available solutions to supply issue. [2016 - ongoing]

INTEC Group On-Call Consulting, Code Review of Occupancy for Lockheed Martin, Rockville, Maryland. Project Manager for task order for on-call assistance for INTEC Group, Inc. to assist with a life safety code review of the occupancy changes to a Lockheed Martin office building located in the City of Rockville. Assisted in the calculation of the occupant load and assessed the exit capacity. Identified potential areas of non-compliance. [Design Completion: 2016; Life Safety Code Consulting Fee: $1,000]

INTEC Group On-Call Consulting, 2400 Research Boulevard Sprinkler Whitebox, Rockville, Maryland. Project Manager for task order for on-call assistance for INTEC Group, Inc. to assist in determining the code implications for demolishing all interior partitions on the sprinkler system. Met with Authority having Jurisdiction (AHJ) for the City of Rockville and developed a performance-based methodology for identifying the capacity of the sprinkler system and allowing for minimal alterations of the sprinkler system, which was originally designed as a pipe schedule system. [Design Completion 2016; Fire Protection Code Consulting Fee: $4,000]

INTEC Group On-Call Consulting, Office Occupancy Load Factors for Lockheed Martin, Rockville, Maryland. Project Manager for task order for on-call assistance for INTEC Group, Inc. to assist with interpretation and negotiation of new 2015 Life Safety Code requirements with the Authorities having Jurisdiction (AHJ's) in the City of Rockville. Obtained code interpretation from the National Fire Protection Association (NFPA) regarding the high-density office areas referenced in the occupant load factor table of NFPA 101. Met with Rockville AHJ and determined the application of the code for various INTEC Group projects including the Lockheed Martin office on 700 King Farm Drive. [Design Completion: 2016; Fire Protection Code Consulting Fee: $2,000]

ACECO Office Renovation, INTEC Group Inc., Silver Spring, Maryland. Assisted engineering team to develop a fire-life safety and MEP engineering report for proposed renovations of the existing ACECO Headquarters Office in Silver Spring, Maryland. [Design Completion: 2016; Assessment Fee: $4,500]

Arlington County Public Schools, Architecture and Engineering Services IDIQ Award, Arlington, Virginia. Project Manager for life safety

code consulting, fire alarm, fire suppression, and security design and consulting services for five-year term contract for on-call services for the Arlington County Public Schools district. [2016, $25,500]

Smithsonian Institution Arts and Industries Building, Life Safety Performance-Based Analysis, Washington, District of Columbia. Project fire protection engineer and VP for project strategy and scope development supporting the performance-based alternatives analysis project to facilitate a performance-based alternative through disaster modeling using the Life Safety Code alternatives process in order to generate the baseline needs to open the building back up after years of closure and prescriptive code violations.

UMass Medical School, Veterans Affairs Medical Office Building Concept, Worcester, Massachusetts Project QA/QC and security strategy development for the physical security component of a concept design for a new facility called “the Virginia”. Concept was a 4-story, 232,000 net square foot medical facility. Provided consultation on physical security features including standoff distance, blast analysis, and site access planning. Concept was submitted to the owner’s representatives for consideration for construction and lease. [Design Completion: 2016, Security Fee: $45,000]

Various Commercial Developers, Various Services, Washington, District of Columbia. Project manager and consulting engineer providing on-call fire protection engineering services as part of a large AE design team for small individual tasks for commercial developer clients with quick turnaround. Tasks generally involved assessment and redesign of fire alarm and suppression systems for renovations of existing office spaces throughout the DC metropolitan region. Designs were coordinated with other disciplines working concurrently using REVIT. [Designs Completion: 2013; Average Design Fee per task for all disciplines $20,000]

Washington Metropolitan Area Transit Authority, Fire Protection Support, in and around the Washington, District of Columbia Region including Maryland and Virginia. Project manager and consulting engineer assisting with support of multiple fire suppression projects at various WMATA facilities, including expansion of existing sprinkler systems and assessments of life safety and suppression systems in rail as well as support facilities. [Ongoing involvement in Design & Construction ended: 2015]

Prince William County, Administration Building, Woodbridge, Virginia. System designer responsible for the shop-drawing level submittal package including full installation details and wiring layouts for the completely new digital, addressable, fire alarm systems throughout the entire building. The building consisted of a three-level structure including a basement, which housed the offices of county government officials and their staff. Role during employment with a fire alarm, security, IT & telecom design-build integrator creating a shop-drawing level design package for installation.

University of Virginia, Historic Chapel Fire Protection, Charlottesville, Virginia. Design engineer assisting in design of the new fire detection and alarm system for the historic chapel on the UVA Lawn & Range. The design package was created with all applicable specifications for prime consulting

work including electrical specifications. The drawings were brought to the shop drawing level to be used as construction documents by the in-house university contractors. Care was taken in specifying products and methods that would ensure that the historical architectural aspects of the chapel would remain intact. [Design Completion: 2006; Construction Completion: 2007; Fire Protection Design Fee: $14,974]

Ernst & Young, Electronic Security Systems, US Nationwide, Various Locations. Project engineer and designer responsible for the design of electronic security systems for 20 offices nationwide. Systems design included design of closed-circuit television, electronic entry control, intrusion detection, and communication systems. All access control panels and related control equipment were manufactured by Software House (Tyco Fire & Security). [Design Completion: 2008; Construction Completion: 2009; Average Design Fee per Location: $5,000]

United Therapeutics, Laboratory Expansion Phase II, Silver Spring, Maryland. Design engineer assisting with the fire alarm system design of the new high-rise addition to a pharmaceutical production laboratory. Project included the integration of the previously constructed low-rise Phase I building system to the new Phase II system. [Fire Protection Design Fee: $116,000]

Inter-American Development Bank, Headquarters Building Fire Alarm System Replacement, Washington, District of Columbia. Fire protection engineer responsible for the design of the replacement fire alarm system for the 1,000,000-square-foot high-rise office building. Project included the integration of the new fire alarm system with the existing electronic security system and building automation system. The existing security system's functionality had to be maintained without compromising the life safety code requirements of the fire alarm system design. The building contains a 12-story central atrium which requires fire alarm system coverage. It also contains a smoke management system that operates by building automation system control of the fans and air handlers as well as pneumatic damper controls. The smoke management operational sequence was incorporated into the new fire alarm system and smoke management control panel for fire department use. Provided co-management of construction period services and extensive witnessing of testing and on-the-spot engineering guidance for design and code-related issues.

Joe Ragan's Coffee, Fire Investigation, Springfield, Virginia. Provided forensic investigative services regarding a fire that occurred in a retail storage warehousing facility.

Boeing Corporation, Computer Facility Data Center, Sacramento, California. Project manager and design engineer responsible for the new data center fire protection system design of fire alarm and detection systems and wet-pipe sprinkler system, both integrated with the existing building-wide systems and new supplemental components. Designed to UFC and local guidelines, including seismic requirements.

Kennedy Center, Fire Alarm Upgrades, Washington, District of Columbia. Design engineer assisting in the layout of the upgrade to the existing fire alarm system in the Eisenhower Theater. Careful attention was

paid to maintaining lines of sight, architectural aesthetics, and system infrastructure that caused the least disruption and contributed to the long-term goal of theatre preservation. Acting as both a vast assembly space and a solemn shrine to JFK, the facility was upgraded with the overall objective of facilitating the timeliest and efficient public occupant evacuation during a potential fire or security-related event. [Fire Protection Design Fee: $91,468]

Baltimore Museum of Art, Security and Fire Alarm Master Plan, Baltimore, Maryland. Security designer involved in the development of a security master plan and fire detection and alarm system master plan. The project scope also included the preparation of construction design and bid documents for replacement of the access control system only as the first phase. In development of the master plan, a security assessment of the facility was conducted that addressed security management issues via the implementation of a needs assessment. This assessment was used as the first building block in forming a security strategy to meet the goal of comprehensively identifying and mitigating the museum's observed vulnerabilities and risks. [Design Completion: 2008; Construction Completion: 2010; Fire & Security Fee: $18,124]

Raytheon, Surveillance Radar Program, Taiwan. Project engineer assisting in the design of a sprinkler system and fire alarm system for nine new buildings at a radar monitoring facility. The technical building was to be designed according to military standards and includes a radar facility, generator building, and water treatment facility. The non-technical building was to be designed according to local Taiwan codes and includes a dining hall, warehouse, security building, and three dormitories. All systems were designed for site-wide integration between buildings and the main monitoring location. [Fire Protection Design Fee: $130,119]

Universal Ballet Academy, Fire Alarm System Replacement, Washington, District of Columbia. Fire protection engineer responsible for preparing DC permit drawings to replace the fire alarm system using specific donated Siemens equipment for the ballet studio, school, and residence hall. [Design Fee: $12,900]

Washington Gas, Operations Center, Springfield, Virginia. System designer responsible for complete design-build, from concept narrative to phased design drawing and specification submittals and the finalized shop-drawing level submittal package, including full installation details and wiring layouts for the fire alarm system upgrade at the utility company's primary industrial operations facility. Project included the installation of a new fire alarm control panel and associated head-end equipment to replace the existing FACP. The new FACP was designed to accommodate the addition of new devices for the new warehouse area and new office areas, as well as to accommodate monitoring and control of the existing-to-remain fire alarm zoned devices that provided coverage for the existing warehouse area. Elevator system interface and control, as well as HVAC system fire alarm system controls, were transitioned from the old system to the new and, where lacking, additional fire alarm equipment was provided to bring the system up to the latest fire alarm code requirements. Alternate detection methodologies were also considered, including UV and IR flame detection and beam detection technologies. The building consisted of a 2-story structure containing an existing warehouse, administrative offices, and an

energy generation plant. The build-out included a new 2-story warehouse area and an office area on the second floor.

Smithsonian Institution National Zoological Park, Smoke Management Study, Washington, District of Columbia. Served as a project fire protection specialist responsible for a smoke management baseline study at eight buildings at the National Zoo including the Great Ape House, Lion Tiger Building, Panda House, Bird House, Kid's Barn, Small Mammal House, Reptile House, and Think Tank. This project was a result of a new standard for Fire and Life Safety in Animal Housing Facilities, as part of the National Fire Protection Association (NFPA) 150, published in 2007 that the Smithsonian Institution has adopted for the National Zoo. This standard requires certain animal housing facilities to have a smoke control system. The baseline portion of this project included fire modeling several design fire scenarios in the various buildings to establish baseline conditions. Results of the fire modeling were summarized and presented in a focus workshop with Smithsonian and National Zoo representatives to determine performance criteria and other parameters that would then be used to perform fire modeling for developing smoke management criteria in each building.

Smithsonian Institution, National Museum of Natural History, Washington, District of Columbia. Project engineer and designer responsible for the design of the electronic security systems for the Smithsonian Central Halls 27 through 30 and the Butterfly House facility renovation projects. Projects included the design and layout of the electronic security systems, consisting of electronic entry controls, panic, closed circuit television, intrusion detection systems, and supportive communications infrastructure to integrate into the existing electronic security system. The design featured a door interlock system for the interactive Butterfly House exhibit. [Design Completion: 2009; Construction Completion: 2011]

Kohl's Department Store, Fire Alarm Replacement, Salisbury, Maryland. System designer responsible for the shop-drawing level submittal package including full installation details and wiring layouts for the completely new fire alarm systems throughout the entire mercantile-type occupancy. The fire alarm system coverage area consisted of a 2-floor retail department store for the display and sale of merchandise, plus a stock processing and storage area on the second floor.

George Washington University, Ames Hall Renovation, Washington, District of Columbia. Project engineer participating in the initial project renovation, fire protection systems design, and implementation of Autodesk Revit MEP 3D Building Information Modeling design software for fire protection systems, including full building-wide sprinkler system with standpipe, fire pump, and fire alarm notification and detection system. Revit symbols (families) and design methodology had to be planned and created beyond the default Revit families for fire protection included with the Autodesk MEP software suite as part of this early adoption of Revit MEP for fire protection systems design.

Montgomery College, Science East and Science West Buildings, Rockville, Maryland. Project manager and design engineer responsible for building and life safety code consulting, sprinkler system design, fire alarm

system design, and construction period services for the new Rockville Campus buildings. The Science East building is the original base building onto which a new addition (science center) was added as an earlier project. The separation of the renovation and addition projects had to be stringently assessed for fire protection systems' integration as well as building and life safety code issues involving multi-year design and construction phasing.

George Mason University, Student Union Building, Fairfax, Virginia. Project manager and consulting engineer responsible for building code, fire protection, and life safety consulting services as well as electronic security systems design for the renovation of the existing campus Student Union Building and new addition. Consulting services consisted of providing project consulting and review by evaluating document conformance to the requirements of the 2004 Virginia Construction and Professional Services Manual, 2006 Virginia Uniform Statewide Building Code with referenced codes (2006 IBC) and standards, and George Mason University design standards related to the automatic sprinkler, fire alarm, and atrium smoke control systems as well as review of the life safety/building code analysis and general consulting/direction. Project management of office staff involved full electronic security system design and associated construction administration services. [Design Completion: 2008; Construction Completion: 2010]

Christopher Newport University, Chilled Water Central Utility Plant, Newport News, Virginia. Project manager and design engineer responsible for the fire alarm system design for the new central utility plant adjacent to the newly renovated and integrated 4-story science building. The project included the design of a completely new fire alarm system for this industrial-type utility structure. [Design Completion: 2011; Construction Completion: 2012]

Christopher Newport University, Science Building, Newport News, Virginia. Project engineer responsible for fire alarm system design for the renovation of the existing campus science building and adjacent Gosnold Hall to be integrated into a new, larger 4-story science building. The project included the design of a completely new fire alarm system integrated with all other new building systems. [Design Completion: 2007; Construction Completion estimated: 2009]

Montgomery College, Laboratory Renovation, Germantown, Maryland. Project manager and design engineer responsible for the design of the fire alarm and automatic sprinkler systems as well as code consulting services for the renovated laboratory space. The renovation changed the use of the space from a computer to a chemistry laboratory. All of the existing equipment in the ceiling was demolished and replaced, including the ceiling grid, and the code compliance of the system was assessed.

Montgomery Bell Academy, Sprinkler Discharge Investigation, Nashville, Tennessee. Provided forensic investigative services for an alleged non-fire discharge of a sprinkler in an attic.

Catholic University, Residence Phase II, Washington, District of Columbia. Project manager and design engineer responsible for the fire alarm and sprinkler system design and code consulting for the new

130,000-square-foot residential building. The building, a 7-story concrete structure, contains 400 beds in suite-style units without kitchens.

Washington and Lee University, Newcomb Hall, Lexington, Virginia. Project engineer responsible for the design of the fire alarm system for the renovation of the historic Newcomb Hall academic building in the Colonnade at the university. [Design Completion: 2006; Construction Completion: 2008]

University of Mary Washington, Monroe Hall, Fredericksburg, Virginia. Project manager and design engineer responsible for electronic security, fire alarm, sprinkler, and code consulting for building renovation. The building currently houses a lecture hall, classrooms, and faculty offices and is one of the oldest buildings on the university campus. [Design Completion: 2007; Construction Completion: 2009; Fire & Security Design Fee: $48,977]

Lord Fairfax Community College, Corron Center, Middletown, Virginia. Design engineer responsible for code consulting and sprinkler design for the new 25,800-square-foot multipurpose training center. Project included a flow test to determine the existing water supply information as well as construction period consulting. [Design Completion: 2005; Construction Completion: 2007; Fire Protection Design Fee: $8,000]

Montgomery College, New Science Center, Rockville, Maryland. Project manager and design engineer responsible for the building and life safety code consulting, hazardous materials analysis, sprinkler system design, fire alarm system design, and construction period services for the new center. Project involved compiling hazardous materials permitting documentation as well as working closely with the city's code officials and fire marshal to achieve the desired architectural vision and integration of the new facility with the existing science buildings on campus. The project also included an electronic security master plan and design. Multiple flow tests were conducted to determine the existing water supply information, and a computational fluid dynamics model of the atrium and surrounding spaces was created to determine the required smoke-exhaust capability and size of the mechanical equipment serving the atrium. A survey was conducted of the existing Science East building to determine its active and passive fire protection systems' adequacy to meet the current code requirements. Building included a 4-story atrium, greenhouse, observatory, and four floors of educational laboratory space. [Fire & Security Design Fee: $134,370]

Georgetown University, Security Guide Specifications, Washington, District of Columbia. Co-developer of security guide specifications for the procurement, installation, configuration, and testing of electronic security systems used by Georgetown University. The guide specifications corrected long-term effects of previous security infrastructure that was not correctly specified, improperly installed, or inappropriately integrated. [Design Completion: 2007; Construction Completion: N/A; Security Fee: $16,330]

Georgetown University, McDonough Business School, Washington, District of Columbia. Security designer of the Georgetown McDonough School of Business. System design consisted of electronic entry controls, emergency call stations, and closed-circuit television systems. The entire system was fully integrated and linked into the Department of Public Safety's control center. [Security Design Fee: $24,407]

Virginia Commonwealth University, Franklin Terrace Renovations, Richmond, Virginia. Fire protection engineer responsible for the fire alarm design in the renovation of an existing building with a single exit. Project included demolition fire alarm drawings and new fire alarm system design. [Design Completion: 2006; Construction Completion: 2008; Fire Protection Design Fee: $62,150]

Georgetown University Department of Public Safety, Communications Center, Washington, District of Columbia. Participated in the design and construction period services of the new communications center on the Georgetown University main campus. Design consisted of the development of new security management systems, a touch screen radio dispatch system, integrated closed circuit television, integration of emergency communications systems, time synchronization systems, and intelligent camera systems. The new center featured two mirrored dispatcher stations with supervisors, an administrator, and police and guard force operations areas. The overall system was fully integrated with a security management system providing automated CCTV call-up on all alarm events. All systems contained in the center were time synchronized with atomic time synchronization equipment. [Design Completion: 2005; Construction Completion: 2007; Security Design Fee: $60,000]

American University, School of International Service, Washington, District of Columbia. Fire protection engineer responsible for the fire alarm design for 142,557 square Feet of new non-separated mixed-use higher-educational space with a below-grade parking garage, a 4-story atrium, and an extension connecting to the Bender Library. [Fire Protection Design Fee: $104,800]

Tidewater Community College, New Portsmouth Campus, Portsmouth, Virginia. Fire protection engineer responsible for the fire alarm system design for four new buildings on the new Portsmouth Campus. Buildings included a main administration building with a multi-purpose room, classrooms, and a library, two classroom buildings comprised of the School of Nursing, Industrial Arts, Science and Math, and a maintenance/physical plant building. All systems were designed for site-wide integration between buildings and main control/monitoring locations. [Fire Protection Design Fee: $153,050]

Georgetown University, Campus-wide Electronic Security System Architecture Upgrade, Washington, District of Columbia. Project engineer and designer responsible for the specifications of the electronic security system for the campus-wide renovation project. Project included the design and layout of electronic security systems main control architecture consisting of electronic entry controls, fiber optic connection equipment, closed circuit television control hardware, intrusion detection systems panels, and supportive communications infrastructure for monitoring and interconnection of all campus building security systems.

Fairfax County Public Schools, Fairfax High School Security and Fire Alarm Replacement, Fairfax, Virginia. System designer responsible for the shop-drawing level submittal package including full installation details and wiring layouts for the integrated fire alarm, access control, intrusion

detection, and closed-circuit television systems. Project included the integration of the new fire alarm system with the electronic security system while incorporating LAN networking and intercommunication equipment and other mechanical and electrical systems control interfacing equipment into the complete design package.

Fairfax County Public Schools, West Fairfax Elementary School Security and Fire Alarm Replacement, Fairfax, Virginia. System designer responsible for a shop-drawing level submittal package including full installation details and wiring layouts for the integrated fire alarm, access control, intrusion detection, and closed-circuit television systems. Project included the integration of the new fire alarm system into the electronic security system while incorporating LAN networking and intercommunication equipment into the design. Special attention was given to providing equipment that was protected from inadvertent damage or vandalism while maintaining the required level of safety within the building for an education-type occupancy containing young children who would need evacuation assistance by adults.

Fairfax County Public Schools, Stone Middle School Fire Alarm Replacement, Centreville, Virginia. System designer responsible for the shop-drawing level submittal package including full installation details and wiring layouts for the completely new digital, addressable, fire alarm systems throughout the entire building. The building required compliance with all restrictive educational type occupancy fire alarm code requirements with special attention paid to specific amendments of the national and statewide codes, as adopted by the county.

National Aeronautics and Space Administration, Langley Research Center - Measurement Sciences Laboratory, Hampton, Virginia. QA/QC technical reviewer responsible for reviewing the design of fire suppression and alarm systems and provided life safety code consulting for a $75 million, approximately 125,000-square-foot 5-story laboratory building. The design included multiple clean room laboratories, flammable liquid storage and use areas, FM-200 clean agent suppression systems, a high intensity radiated fields (HIRF) laboratory, and preaction suppression systems. [Design Completion: 2014]

Advanced BioScience Laboratories, Lower-Level Laboratory Expansion III, Rockville, Maryland. Project manager and consulting engineer responsible for a performance-based smoke management/control analysis for compliance with NFPA 150 Fire and Life Safety in Animal Housing Facilities expansion, located within about half of the first story of a 3-story building. Services included review of construction documents provided by the MEP engineer related to fuel load (fire load) within each space, laboratory staff operational procedures, volume of rooms, type of fire suppression system per contractor submittal documents, and location of exhaust and supply mechanical HVAC system components serving each space. A smoke control analysis baseline was then determined by evaluating the level of compliance with the requirements and methods within the applicable codes and standards for the HVAC system. The performance-based analysis was then provided to evaluate the specific conditions of the laboratory spaces using DETACT sprinkler activation and fire growth analysis software, occupant egress calculations (to attain the

required safe egress time), and computation fluid dynamics modeling using Fire Dynamics Simulator software to determine the available safe egress time.

National Lutheran Communities & Services, National Lutheran Home Nursing and Intermediate Care Facility, Rockville, Maryland. Project manager and consulting engineer responsible for providing building, fire, and life-safety code consulting services and strategic planning and commissioning services for the phased renovation of an elderly healthcare facility. Project design team roles included commissioning from preliminary design through construction period acceptance testing and design team management as required per the Rockville city code fire protection engineering design evaluation protocol.

University of Virginia, Medical Center Fire Alarm System Replacement, Charlottesville, Virginia. Design engineer assisting in the concept study to replace the fire alarm system in a 1,200,000-square-foot area of the hospital. The project consisted of a study and documentation of the existing system architecture and the proposal of a new system architecture. The system contains zoned smoke control including damper control and door closer control as well as voice communications. The report had to take into account the phasing of renovations occurring over the next few years and the variety of different fire alarm systems present, which had been incorporated over previous renovation cycles. The report and findings documentation also contained a projected cost estimate for construction. [Design Completion: 2009; Construction Completion: 2011; Design Fee: $53,820]

Kuwait National Petroleum Company, Oil Refinery Pier Inspection, Al-Shuaiba Industrial Area, Kuwait. Project manager and consulting engineer generating an assessment report of existing fire protection features of an oil refinery and pier in the Arabian Gulf as part of a larger multi-discipline contract. Report included descriptions of existing conditions, assessment of adequacy of existing diking, standoff distances, and fire protection systems, recommended upgrades beyond code requirements, and cost estimates for budgetary use by the client. Fire protection scope included systems covering areas of the facility involving operations building protection, large storage tank protection, and ship docking protection. [Design Completion: 2013; Total Fee for all disciplines $912,072]

Prince George's County Department of Parks and Recreation, Southern Regional Technology and Recreation Complex, Fort Washington, Maryland. Project manager responsible for code consulting for a new community/recreation center.

Commonwealth of Virginia, James Monroe Museum, Fredericksburg, Virginia. Project engineer assisting in the design of the fire alarm and security system for this historic structure. The structure resides on the University of Mary Washington campus and uses the university's campus standards, which mandate a fully integrated fire alarm and security system. This single multi-functional system was controlled by a single digital control panel as the master fire/security head-end unit. This integrated system arrangement was carefully specified and designed to maintain compliance with all fire protection code requirements that are often at odds with multi-

use integrated systems. This strict code compliance was maintained without reducing the adequacy of the high-level security coverage required for a historic landmark museum.

Prince George's County Department of Parks and Recreation, Hillcrest Heights Community Center, Temple Hill, Maryland. Project manager responsible for construction period management of the design issues associated with the fire alarm and automatic sprinkler design and consulting services for an expansion of the center. [Fire Protection Design Fee: $30,720]

Washington Metropolitan Area Transit Authority, New Carrollton Metrorail Station Parking Garage, New Carrollton, Maryland. System designer responsible for the shop-drawing level submittal package, which included full installation details above and beyond the basic floor plans, riser diagram, and standard details, such as product data sheets and quantity/cost of materials, primary power and secondary battery power and quantity/size calculations, end-of-line voltage (voltage drop) calculations, installation wiring diagrams and mounting diagrams, floor plan wiring and equipment layouts, for the integrated fire alarm, access control, and closed circuit television systems. Project included the integration of the new fire alarm system with the electronic security system.

Washington Metropolitan Area Transit Authority, Fire Protection Staff Augmentation based in WMATA Headquarters, Washington, District of Columbia. Consulting engineer assisting with on-call and on-site fire protection support. Provided project planning and design services for various facilities including major office installations, underground transit stations, industrial maintenance facilities, and storage warehouses. Task orders included third-party reviews, designs for wet and dry water-based suppression systems, FM-200 and halon 1301 systems, and individual fire alarm installations as well as fire alarm network revisions. Responsibilities also included revisions of Washington Metropolitan Area Transit Authority (WMATA) standards and design guides, construction administration, and fire/life safety facilities assessment reports. [Ongoing involvement in Design & Construction ended: 2015; Fire Protection Total Fee for all tasks averaged $500,000 annually, 2012-2015]

US Army, Fort Knox High School, Fort Knox, Kentucky. Project engineer and designer responsible for the design of electronic security systems for the Fort Knox High School renovation project. The project included the design and layout of electronic security systems consisting of electronic entry controls, panic control, closed circuit television, intrusion detection systems, and supportive communications infrastructure for monitoring the security systems from the Fort Knox Police Station, located several miles away.

Architect of the Capitol, Supreme Court of the United States, Washington, District of Columbia. System designer responsible for assisting in creation of the shop-drawing level submittal package, including full installation details and wiring layouts for the replacement fire alarm system throughout the main building including the basement. The submittal contained the devices for both the main building phase and the previously completed annex phase, so that a complete system submittal was provided

for final documentation record in addition to complete operations and controls details. The system was provided with eight channels of digital audio and live voice paging capability along with multiple annunciators at the fire control room and security command center. The system was designed and programmed to provide the AHJ-approved pre-signal feature functionality. This process requires that security personnel be notified at the security command center, verify the fire is present and determine if the building requires evacuation, then security personnel manually initiate building notification appliances for general evacuation. Separate control for the new and existing fire alarm control panels was designed to prevent any reset loops or inadvertent activation of the general alarm on either panel. The system was also designed to meet specific survivability requirements and complex circuit routing.

Architect of the Capitol, House of Representatives Office Buildings Central Reporting System, Washington, District of Columbia. Project engineer and construction administration period manager responsible for designing the fiber optic connection between fire alarm control panels within each building to report to a main and secondary location to be monitored by the Capital Police and maintenance personnel in the Longworth Building. The project included the integration of three different manufacturers' control panels and a full conduit and wiring layout for shop drawing level design. Also managed federal government multi-year indefinite delivery indefinite quantity contract, which included this project task order. [Fire Protection Design Fee: $119,660]

General Services Administration Regional Office Building, US Department of Homeland Security Suites, Washington, District of Columbia. Project engineer responsible for strategic planning and guidance for the design of the fire protection systems to be provided as part of the renovation of the 5th floor suite spaces. The project covered approximately 12,000 square Feet, of which 750 square Feet were planned to be used as a data center containing an FM-200 type gaseous fire suppression and detection system as part of the Phase-2 portion of the project. The fire protection systems throughout the spaces were designed to meet GSA standards. Systems included a wet-pipe automatic sprinkler system, fire alarm notification and detection components, and the supplemental gaseous suppression system. Other associated data center fire protection system features included interface of the existing building fire alarm system with the FM-200 fire detection, gaseous agent release, and release notification sub-systems; electrical emergency power systems; mechanical HVAC systems; and architectural/structural features to ensure the desired level of fire protection mitigated identified risks.

Architect of the Capitol, House of Representatives Longworth Office Building, Washington, District of Columbia. Project manager and design engineer responsible for designing the complete replacement fire alarm system. The project included a design-build project incorporating device, wiring, and conduit installation means; methods detailing; and specific manufacturer product selection and recommendations. Also managed a federal government multi-year indefinite delivery indefinite quantity contract that included this task order. [Fire Protection Design Fee: $150,010]

US Department of State, Riga Embassy, Riga, Latvia. Project engineer assisted on code consulting on the design of a new American embassy. Among general building and fire code evaluations, the project included an evaluation of the impact of vertical openings on egress.

US Department of State, Jeddah Embassy, Jeddah, Saudi Arabia. Project engineer for code consulting on the design of a new American embassy. The project included code reviews of the consular general residence and the staff housing building within the compound.

Architect of the Capitol, Hart and Dirksen Senate Office Buildings, Washington, District of Columbia. Project manager and consulting engineer responsible for construction period consulting services for shop drawing level issues associated with a fire alarm system retrofit throughout the buildings. Consulting services included amplifier sizing and voice calculations, cabling and listing requirements, duct detection installation requirements, electrical code issues and panel placement, shop drawing level submittal review comment response assistance, and fire alarm testing planning.

Classified Client, Bluespec Security and Access Control Systems, Classified International Location. Project manager and consulting engineer for this sensitive compartmented information facility (SCIF) based project involving the design of physical security and access control systems for a building on a high-security compound, in a classified overseas location. The 3-story building featured three custom-defined security levels programmed to meet client needs consisting of a co-habitant area, a high-security area, and a value level security SCIF area. Design objects involving security sub-system components were different for each security level, while each was still part of the same integrated system. [Design Completion: 2013]

Longwood University, Greenwood Library & Chichester Science Center Fire Shutter Study, Farmville, Virginia. Project Manager supporting a fire protection engineering analysis of the fire shutter systems in two facilities on campus. Code analysis provided justification for retention or elimination of certain features during an ongoing facility upgrade. [Completed 2012]

Broadfalls Apartments, Fire Alarm Replacement, Falls Church, Virginia. Project Manager involved in the design review of a fire detection and alarm system for a mixed occupancy building in Falls Church, Virginia. This 4-story apartment building featured residential occupancies on all floors, with mercantile and assembly operations on the ground level. [Design Completion: 2011; Construction Completion: 2011]

Woodrow Wilson High School, Security Commissioning, Washington, District of Columbia. Project Manager involved in the planning and execution of the security commissioning plan for a system incorporating access control systems, CCTV, and intrusion detection systems. The school was able to remain open during the process, as commissioning of this 4-story building took place after-hours to minimize impact. The commissioning was executed as an objective 3rd party and required collaboration with two

other parties involved with the systems' design, equipment supply, and installation/programming. [Security Commissioning Completion: 2011]

US Department of Veterans Affairs, Kansas City Virginia Medical Center - Emergency Room Expansion, Kansas City, Missouri. Project engineer for approximately 40,000-square-foot, $10 million hospital addition and renovation including life safety, fire alarm, and fire suppression. Design included mixed occupancies of institutional and business. [Design Completion: 2013; Construction Completion: 2014]

US Department of State, Bureau of Overseas Buildings Operations, Diplomatic Transit Facility, Sana'a, Yemen. Project engineer assisting a large team of consultants in development of a building assessment report of a 270,000-square-foot former hotel turned dormitory for DoS employees stationed in Yemen. The existing structure was built and previously renovated under various foreign building codes and was in varying levels of disrepair due to the unstable political climate in the region. Our team provided master planning and design for fire protection and electronic security support for site modifications under a contract that included funding targeted at major civil, electrical, telecommunications, and physical security repairs and upgrades. [Design Completion: 2014; Construction Completion: N/A (project construction phase on hold due to civil unrest); Total Fee for all disciplines: $2.2 million]

US Coast Guard Telecommunications and Information Systems Command, Basewide Fire Alarm Upgrade, Alexandria, Virginia. Project manager and consulting engineer for this fire alarm systems replacement for 10 buildings and retrofit for 16 buildings for radio fire alarm reporting to the proprietary monitoring station, with construction budget of $500,000. Integrated the existing public-address system as a mass notification system. Developed survey report and fire alarm designs, researched products, and supervised intern. [Design Completion: 2013]

Washington Metropolitan Area Transit Authority, Jackson Graham Building Assessment, Washington, District of Columbia. Fire protection on-call consultant and project engineer for the building assessment. Project involves an analysis of the existing fire suppression, fire alarm, and life safety systems in the building to determine deficiencies and recommendations to comply with current building code and National Fire Protection Association requirements for a high-rise building. The building is 427,770 square Feet, 3 stories below grade and 8 stories above grade. A multidisciplinary report is being prepared by fire protection, mechanical, and electrical engineers outlining the required upgrades to the existing systems to meet current codes. These upgrades will become future task orders for WMATA contracting. [Design Completion: 2014; Fire Protection Fee: $67,000]

US Army Corps of Engineers, Fort Sam Houston - Building 128 Renovation and Upgrade, San Antonio, Texas. Project manager and consulting engineer for a renovation and upgrade project for a 2-story building at Fort Sam Houston, which is to be retrofitted with a new sprinkler system and fire alarm/mass notification system. Designed and coordinated the new sprinkler system with other disciplines, designing the fire alarm system and providing code consulting to the design team. Also produced

the sprinkler and fire alarm specifications for the project using SpecsIntact. Project required knowledge of Unified Facilities Criteria, National Fire Protection Association codes, International Building Code, and International Fire Consultants. Drawings were prepared using AutoCAD software. Total square footage is 16,432 with a total construction cost of $5,500,000.

Classified Client, Fire Pump Replacement, Classified Location. Project engineer overseeing A-E services for this classified federal contract. The AE team provided design services to upgrade the fire pump installations at three buildings. The buildings included a 9-story, 517,000-square-foot building, a 10-story, 939,100-square-foot building and a 1-story, 1,275-square-foot building. This task included architecture, civil, mechanical, electrical, and fire protection services. The project Fee was $258,800. The total construction cost was estimated at $1.8 million. [Design Completion: 2013]

MPO, AE Services IDIQ Contract, Classified Location. Project manager and consulting engineer providing planning and design oversight of the fire protection engineering department staff. Task orders involve basewide fire pump and fire suppression design services, fire alarm system upgrades, and life safety consulting services. Participated in multiple planning discussions with contracting officer's technical representatives involving long-term fire protection and life safety upgrades and basewide improvement strategies. [Design Completion involvement ended: 2015]

Washington Metropolitan Area Transit Authority, Communications Term Contract, in and around the District of Columbia Region including Maryland and Virginia. Project manager for a service yards' fire alarm systems upgrade. Project tasks included Carmen Turner headquarters building and four service yards with campus networking, emergency voice notification, and monitoring of wet-pipe, pre-action, and FM-200 suppression systems. Tasks included cost estimation, project scheduling, and fire alarm system design. Coordinated with authorities having jurisdiction including Maryland, Virginia, DC, and WMATA. [Ongoing involvement in Design & Construction ended: 2015; Fire Protection Total Fee for all tasks averaged $500,000 annually, 2012-2015]

Metropolitan Washington Airports Authority, Washington Dulles International Airport - Automated People Mover, Dulles, Virginia. Project engineer responsible for third-party observation/witnessing and associated report creation for stair pressurization testing in the newly constructed automated people mover subway station area.

Metropolitan Washington Airports Authority, Ronald Reagan Washington National Airport – Emergency Medical Services Facility, Washington, District of Columbia. Project engineer and designer responsible for the design of the electronic security systems for the new Aircraft Rescue and Fire-Fighting Facility (ARFFF) which included fire and EMS response services. Project included the design and layout of the electronic security systems consisting of intrusion detection, access control, closed circuit television, and supportive fiber optics communications infrastructure to integrate into the existing electronic security system control center.

US Army, Camp Stanley Ammunition Surveillance Building Relocation, Camp Stanley, Texas. Project QA/QC specialist for fire protection and life safety for Camp Stanley Storage Facility Ammunition Surveillance Building relocation project. Project scope included hydrant flow testing and design of site fire protection water service including pre-packaged fire pump. [Design Completion: 2012]

Classified Client, Colosseum Sites A & B, Classified International Location. Project manager and consulting engineer encompassing the design of physical/electronic security systems for new high-security SCIF enclosed compounds, in a classified overseas location. One of the two sites involved strategic planning and design of physical security, access control, and intrusion detection, including a microwave fence intrusion detection system supplementing K-12 rated vehicle gates and compound-wide CCTV systems. The other site security design involved the strategic planning and design of physical security, access control, and CCTV systems for a single SCIF space within an existing facility in a separate location. The design involved assessment of unique SCIF requirements, development of system specifications, security related on-call consulting, written guidance to the rest of the design team, and incorporation of state-of-the-art components per federal standards. [Design Completion: 2013]

US General Services Administration, Fire Protection Systems Testing, Washington, District of Columbia. Project manager and consulting engineer responsible for providing fire protection consulting services and overseeing system testing on multiple task orders including management of an indefinite delivery indefinite quantity contract. Task orders included witnessing fire protection pre-acceptance and final acceptance testing, providing defects and omissions reports, and supplementing these with engineering recommendations and follow-up analyses. Buildings under task orders included Eisenhower Executive Office Building, White House remote delivery site, and JW Powell federal office building.

US General Services Administration, Consolidated Survey, Washington, District of Columbia. Project supervisor surveying fire alarm, fire protection, life safety, electrical systems, and general code compliance in over 10,000,000 square Feet of secured GSA-owned buildings. Occupancies included business, laboratory, assembly, and storage. Data from surveys was developed into a report for each building, delivered to GSA representatives to inform them of the conditions of their assets and the priority of improvements.

World Bank, Solicitation for Offers - Fire Protection and Life Safety Assessment, Washington, District of Columbia. Fire protection engineer responsible for performing an SFO fire protection and life safety facility assessment survey and preparing the accompanying SFO reports, in accordance with the requirement of the US General Services Administration, for the property located at the H Building. The property is a 12-story building of approximately 498,000 square Feet.

US General Services Administration, Fire Protection Systems Assessment in Multiple Buildings, Washington, District of Columbia. Evaluated condition and code compliance of fire alarm and suppression equipment; developed proprietary data logging system for efficient survey

note use; developed exhaustive reports of findings, concluding with service recommendations and priorities and a meeting with stakeholders for debriefing; and entered BER report data into GSA's IRIS and VFA software.

US Federal Reserve Board, New York Avenue Building, Washington, District of Columbia. Project engineer and co-manager responsible for providing fire protection design and consulting services including sprinkler and fire alarm system retrofit fast-track designs for the first, second, sixth, and P1 floors of the New York Avenue Building, totaling around 40,000 square Feet of secure office space.

US Department of Homeland Security, National Operations Center, Washington, District of Columbia. Project engineer assisting with strategic planning and development of fire alarm and mass notification system infrastructure design with consideration of state-of-the-art systems involving mass notification, high-security standards, and the latest national/federal requirements. The overall in-house portion of the project's scope consisted of code consulting and retrofit designs of the sprinkler and fire alarm/mass notification systems for the 3-story below grade 420,000-square-foot operations center on the St. Elizabeth campus.

US Army, Tobyhanna Army Depot Buildings 1A, 4, 11, 17, 20, and 72, Tobyhanna, Pennsylvania. Project manager and design engineer responsible for the retrofit of complete building-wide integrated fire alarm, mass notification, and central radio reporting systems into five separate buildings, including the fire department monitoring/reporting location on the base. For building 20, only central monitoring/reporting was retrofitted. The total gross area covered by the systems designed for these buildings is around 945,000 square Feet. This project was a design-build contract, and design management was provided through shop-drawing level documentation and consulting through the construction period. Also, a sprinkler and standpipe systems evaluation report was provided as an initial assessment to use as a basis for US Army Corps contracting of future fire suppression related renovations within the referenced buildings and through the entire base. The sprinkler and standpipe systems evaluation included site-wide water supply flow testing as well as individual building surveys (Buildings 1A, 4, 11, 17, and 72) and a findings/code-evaluation report including ROM cost estimates and preliminary hydraulic calculations. Also managed a federal government multi-year indefinite delivery indefinite quantity contract that included this task order.

Social Security Administration, Security West Building Data Center, Baltimore, Maryland. Project manager and design engineer responsible for designing fire detection and alarm upgrades and FM-200 systems for three rooms containing essential electronic equipment for a building on the Social Security Administration (SSA) campus.

US Internal Revenue Service, Data Center, Detroit, Michigan. Project engineer and designer responsible for designing the new pre-action sprinkler system valve, trim, and control system as well as fire alarm detection and alarm system upgrades for four data center floors of the IRS operations facility (high-rise building) near Detroit. The design required interface with, and upgrades to, the existing building-wide fire alarm system

as well as a survey of the renovation of the current construction project to replace the existing sprinkler system layout on those floors.

US Department of Education, Door Replacement, Washington, District of Columbia. Life safety and security consultant for a drawing review of an exterior/interior door replacement at a federal building. About 65 doors and door hardware were replaced including electronic access control and intrusion detection devices with delayed egress hardware. [Fire & Security Fee: $3,000]

US Environmental Protection Agency, Fire Protection Renovation, Research Triangle Park, North Carolina. Design reviewer responsible for reviewing the 15% design submission. Submission included documentation on the replacement of the fire alarm system and corrections to fire pump code deficiencies. [Fire Protection Design Fee: $1,350]

Military Adjudication Activities Co-Location Facility, Fort Meade, Maryland. Project manager and design engineer responsible for creation of the Fire Protection and Life Safety portion of the parametric design report as well as developing the schematic design level sprinkler, fire alarm, and mass notification systems. The report was created using the base standards and applicable codes to determine the design requirements that future design documentation would be based on. A flow test indicating the existing water supply was conducted, and preliminary hydraulic calculations were also provided as part of the task scope. [Fire & Life Safety Design Fee: $32,226]

US General Services Administration, E. Barrett Prettyman Courthouse, Washington, District of Columbia. Project manager responsible for construction period management of the bidding/construction period design issues associated with the SCIF renovations to the courthouse facility. Specific requirements and design methodology had to be implemented to provide the required SCIF high-security areas with fire alarm and sprinkler systems for life safety. [Fire Protection Fee: $25,000]

US General Services Administration, Federal Office Building 10A Suite 825/812, Washington, District of Columbia. Project manager and design engineer responsible for creating a sprinkler system alteration design package in coordination with suite renovation plans created by the entire design team. The alterations to the sprinkler system also had to be coordinated with the existing-to-remain building-wide sprinkler system in its present condition, while meeting new renovated suite layouts and GSA requirements.

US Army Reserve, Army Reserve Facilities Fire Protection, Various Locations, New York. Project engineer and designer assisting in the survey and design of fire alarm systems for six Army Reserve sites. Design included the upgrade of the fire alarm systems for storage and repair buildings at each site. System design included full fire alarm system designs for peripheral buildings as well as control panel upgrade and integration with the main command center.

US Federal Emergency Management Agency, Department of Homeland Security Headquarters, Washington, District of Columbia. Project

engineer and designer responsible for the design of the electronic security systems for the headquarters building. Project included the design and layout of the electronic security systems consisting of electronic entry controls, panic, closed circuit television, intrusion detection systems, sensitive compartmented information facilities (SCIF), and control/communications infrastructure for monitoring of the security systems.

Classified Client, Various Classified Security Projects, Various Overseas Locations. Project engineer/project manager responsible for the design of a state-of-the-art closed circuit television system, access control system, and intrusion detection system within SCIFs and site-wide areas. The systems operated in extreme conditions and were interconnected with other electronic security subsystems to provide intrusion and object tracking functionality for large-scale military operations. Highly sensitive area camera coverage was designed to use intelligent video analytics to analyze specific movement characteristics within remote areas of the facilities. Many of the challenges included the use of various data transmission systems, including fiber optics, and the systems had to maintain uninterrupted operation on non-conventional power sources.

US Army Corps of Engineers, CSSG Headquarters Feasibility Study & Fire Protection Water Supply System Improvements, Laurel, Maryland. Project engineer developing a detailed report of existing water supply conditions at a 200,000-square-foot facility and corrections to remedy deficiencies in the water supply and identifying correction options at several levels of cost. Developed a life safety deficiencies report for future building renewal work. Developed design documents for a $1.9 million site water supply improvement project, including two new fire pumps, new mains, and sprinkler replacement. [Design Completion: 2013; Total Fee for Fire Protection and Civil Engineering: $280,660]

California Department of Corrections and Rehabilitation, Fire Alarm and Security Intrusion Budget Package, Various Locations, California. Lead fire protection engineer for a fire protection and life safety study to determine the present status of the fire protection systems along with integrated security intrusion systems (including personal alarm) and provide recommendations for remediation and improvement of institution-wide and program-wide fire protection deficiencies. Various existing correctional institutions throughout the state, as well as CDCR standards and design guides, were surveyed and assessed by a large team of fire protection engineers, including myself who also acted as technical project manager and electronic security consultant addressing the inter-related security intrusion systems. This project included assessment of multiple sites, cost estimation with phasing of recommendations, and site-wide networking schematic design involving many different forms of side-wide networking technology from wireless radio to underground single-mode fiber, all during a fast-paced project schedule. [Fee: $500,000]

Private Developer PI, Culpeper 6th Floor Basement Renovation, McLean, Virginia. Fire protection engineer providing consulting to the project team under a classified federal contract. The project consisted of design services for renovation of an existing 12,000-square-foot floor of an existing building to include new conference rooms and office areas. The project team provided coordinated architecture, electrical, mechanical, and

fire protection services with the goal of integrating new design layouts into existing building systems while focusing on cost saving options to reduce the total construction cost. [Fee $65,247]

New Jersey Institute of Technology, Event and Recreation Center Phases I and II, Newark, New Jersey. Quality Assurance / Quality Control and strategic planning for fire protection design of fire alarm and fire suppression systems for a new arena and wellness center on the NJIT campus. [08/2015-03/2016]

Eisenhower Memorial Commission, National Dwight D. Eisenhower Memorial, Washington, District of Columbia. Quality Assurance / Quality Control and strategic planning for fire protection and life safety design for the memorial in Washington DC. [2016]

Washington Metropolitan Area Transit Authority, Metrobus Facilities, in and around the District of Columbia Region including Maryland and Virginia. Fire Protection Engineer and Quality Assurance / Quality Control reviewer responsible for oversight of the on-site assessment of fire suppression, alarm, and life safety systems present at each of WMATA's six (6) bus depots throughout the DC region. Results were submitted as part of a multi-discipline assessment report and accompanied by remediation recommendations and cost estimates. [Design Completion: 2015; Total Fee for all disciplines: $150,000]

US Army Corps of Engineers, AE Services for Real Property 2010-2015: East Campus Building 2 Design, Fort Meade, Maryland. Quality Assurance / Quality Control and fire protection and security design strategy development for this high security design project. [Design Completion: 2015]

US General Services Administration - Mid-Atlantic Region 3, Social Security Administration NTI Switch Room Feasibility Study, Woodlawn, Maryland. Quality Assurance / Quality Control and fire protection strategy development for this high value feasibility study project. [Design Completion: 2015]

California Department of Corrections and Rehabilitation, Health Care Facility Improvement Program, Various Locations, California. Quality Assurance / Quality Control and fire protection plus security intrusion detection strategy development for this correctional healthcare project including third-party submittal review and on-call consulting services. [Design Completion: 2015]

Warner Bros. Entertainment Inc., Theme Park Stage C Concept Design Refinement/Validation and Stage D Schematic De, Abu Dhabi, United Arab Emirates. Quality Assurance / Quality Control and fire protection design strategy development for this large entertainment facility design project. [Design Completion: 2015]

US Department of Veterans Affairs, Veterans Health Administration, Northport Veterans Affairs Medical Center - Combined Heat and Power System, Northport, New York. Quality Assurance / Quality Control and fire protection engineering strategy development for this addition of gas turbine energy generation for an existing boiler plant. The Project included code

analysis and design for fire alarm, fire suppression and life safety systems. [Design Completion: 2016]

US Coast Guard - Civil Engineering Unit Cleveland, Tingle Hall Berthing Fire Protection Assessment, New Smyrna Beach, Florida. Fire protection engineering discipline lead providing strategic planning/scoping and quality control oversight of this fire protection engineering task order under a Coast Guard Nationwide AE IDIQ contract located at the Coast Guard base on the Ponce de Leon inlet. The project consisted of fire resistance ratings, fire suppression system assessment and testing within an existing wood framed residential board and care facility known as Tingle Hall. Results and recommendations from the assessment along with an associated construction cost estimate defined a design scope consisting of full demolition of an existing NFPA 13R residential sprinkler system and retrofit of a new NFPA 13 compliant commercial system. Construction administration services were provided including contractor shop drawing review. [Fire Protection Fee: $28,433]

University of South Carolina, Williams-Brice Stadium Egress Evaluation, Columbia, South Carolina. Fire protection engineering team leader responsible for updates to life safety egress calculations following the gating and grounds (approximately one acre in size) renovation of the USC football stadium. Fire protection specialist that worked closely with the multidiscipline/multi-firm joint venture team to develop a life safety design for the approval of the authority having jurisdiction. The life safety design was to prove that planned renovation did not reduce egress capacity for a worst-case stadium evacuation scenario and complied with all applicable codes. [Fee $19,000]

Syngenta, Various Projects, Various USA Locations Nationwide. Fire Protection Program Manager, Quality Assurance / Quality Control and fire protection strategy development for various project assessment and design services over numerous Syngenta high-hazard facilities throughout the United States provided by fire protection engineers dedicated to Syngenta requests or conducted myself as fire protection engineer of record, as needed. [Design Completion: 2016]

Syngenta, Crop Protection Plant Warehouse, Omaha, Nebraska. Fire protection engineer for crop protection plant warehouse specific task under a term contract multi-task agreement. The existing warehouse is in Omaha, Nebraska and tasks entailed preparation of a fire protection engineering assessment and report detailing the client's 115,000-square-foot warehouse compliance status with respect to the applicable NFPA, ICC, and other codes adopted by the local jurisdiction. The project was to provide observations, chemical analysis, and recommendations for fire protection of the chemical storage warehouse. This included meetings and negotiations with the local authority having jurisdiction and property insurance provider for approval of a fire protection strategy for protecting persons and property from a fire fueled by a new chemical product developed by Syngenta. [$30,000]

National Aeronautics and Space Administration, Langley Research Center, Measurement Systems Laboratory, Hampton, Virginia. Fire protection, fire alarm, and life safety engineer for the new Measurement

Systems Laboratory (MSL) contracted under the US General Services Administration, Mid-Atlantic Region 3, Langley New Town Program contract. The 175,000-square-foot, $80 million MSL is the third phase in the multi-year new town plan and will serve as the campus primary research and development facility; accommodating the advanced sensing and optical measurement, electromagnetics, electronics, remote sensing flight systems, flight software systems, and laser remote sensing branches of NASA's research and engineering directorates.

Stony Brook University Hospital, Medical & Research Translation Building & New Bed Tower, Albany, New York. Fire protection QA/QC reviewer and life safety support for a $300 million estimated construction cost, 500,000-square-foot addition to a hospital. Special consideration was taken for non-separated mixed use of assembly, institutional (ambulatory and non-ambulatory care), business (general business, inpatient care, and laboratory use), and storage occupancies. Design included multiple open stairs between different occupancies, fire walls, smoke zones, horizontal exits, and special locks. [Design Completion: 2016; Construction Completion: Estimated 2018]

US Naval Facilities Engineering Command Mid-Atlantic - Norfolk, UFC 1-200-01 DoD Building Code Update, Roanoke, Virginia. Quality Assurance / Quality Control and fire protection strategy development for this design criteria re-write project. [Design Completion: 2015]

US General Services Administration, Philadelphia Courts and Law Enforcement Agencies 2010-2015 - Altmeyer Building W, Baltimore, Maryland. Quality Assurance / Quality Control and fire protection design strategy development for this courts facility design project. [Design Completion: 2015]

GE Technology Finance, Site Monitoring and Operations, Cambridge, Ontario. Quality Assurance / Quality Control and fire protection design strategy development for this industrial facility design project. [Design Completion: 2015]

Atlanta Department of Aviation, Asset Management and Sustainability On-Call Services 2012-2017: Technical Campus, Atlanta, Georgia. Quality Assurance / Quality Control and strategic fire protection engineering scoping services for this assessment project. Storage and maintenance facility assessment and testing administration to determine fire alarm system and fire suppression system operability and code compliance. [2015 Project Assessment Completion]

Echo Pier Restoration, Kwajalein Atoll, Marshall Islands. Quality Assurance / Quality Control and fire protection design strategy development for this marine facility design project under a US Army Corps of Engineers IDIQ Contract. [Design Completion: 2015]

Confidential Petroleum Company, Liquefied Natural Gas Retail Truck Fueling Station Renovation, Houston, Texas. Quality Assurance / Quality Control and fire protection design strategy development for this oil and gas facility design project. [Design Completion: 2016]

Classified Client, Sensitive Compartmented Information Facility, Fort Smith, Arkansas. Quality Assurance / Quality Control and fire protection and security design strategy development for this high security SCIF project under a US National Guard Bureau, AE IDIQ contract. [Design Completion: 2016]

Washington Metropolitan Area Transit Authority, Tunnel Ventilation Standard Operating Procedure Review and Master Planning, in and around the District of Columbia Region including Maryland and Virginia. Fire protection engineering manager and on-site liaison for large study reviewing system wide tunnel ventilation procedures. Scope included reviewing prior conclusions, interviewing stakeholders, modeling existing conditions, providing recommendations to client representatives, and overseeing integration of new revisions. [Design Completion: 2016; Total Fee for all disciplines including tunnel specialists: $450,000]

Downtown Partnership of Baltimore Inc., Penn Station - State of Good Repair Improvement Program, Baltimore, Maryland. Fire protection engineering discipline leader providing project scoping, oversight, and review on a multidisciplinary team conducting a 4-phase SOGR assessment of historic 82,770-square-foot Penn Station at the request of Amtrak. The project consisted of a facility survey and assessment to document deficiencies, generate a construction cost estimate, and provide recommendations to facility stakeholders highlighting areas of facility improvement. Project findings were planned to be used as a basis for the issuance of a separate remediation design contract. [Fee $359,727]

US Department of Justice, Federal Bureau of Investigation, Building Renovation, Quantico, Virginia. Fire protection engineering discipline leader for this multidiscipline, multi-building, renovation project at the FBI complex. The fire protection engineering scope consisted of an extensive life safety survey to identify code compliance issues; the results of which were compiled into an assessment report. The assessment report was then used as the basis for bridging documents level designs that the fire protection members of the project team created for the purpose of future FBI-generated scopes of work for upgrade projects within six 42-year-old buildings, totaling over 200,000 square Feet, on the FBI Academy campus. Work included upgrades to the fire alarm and life safety systems; plus upgrades to, and additions of, sprinkler systems where required throughout the facilities. This project task order was awarded under the FBI Worldwide Federal On-site APE Services contract. [Construction estimated $6.8 million]

US General Services Administration, Courthouse Complex, Building Evaluation Report, Erie, Pennsylvania. Fire protection engineer responsible for assessing the condition and code compliance of fire alarm and fire suppression equipment as part of a multidiscipline team providing comprehensive building evaluation report assessment services. Developed a detailed report of findings and recommendations with associated budgetary construction cost estimates, further fire protection service recommendations, and future capital improvement project prioritization. Assisted in entering report data into GSA facilities capital planning and management software, VFA. [Fee $109,250]

US Department of Justice, Federal Bureau of Investigation, Building 4 Renovation, Quantico, Virginia. Fire protection engineer responsible for reviewing contractor-generated design documents and attending design meetings as a representative of the Planning and Design Unit at the FBI Academy. Provided Feedback on the fire suppression, fire alarm, and life safety design aspects involving renovation of an auditorium building. This project task order was awarded under the FBI Worldwide Federal On-site APE Services contract. [Fee $117,879]

US General Services Administration - Mid-Atlantic Region 3, Social Security Administration Delegated Buildings Level 4 Building Evaluation Report, Baltimore, Maryland. Fire protection engineer responsible for assessing condition and code compliance of fire alarm and fire suppression equipment as part of a multidiscipline team providing close to $1 million in building evaluation report assessment services covering 2.7 million square Feet. Developed detailed reports of findings and recommendations with associated budgetary construction cost estimates, further fire protection service recommendations, and future capital improvement project prioritization. Assisted in entering report data into GSA facilities capital planning and management software, VFA.

US Department of State - Bureau of Overseas Building Operations - Middle East, Kabul Master Plan, Kabul, Afghanistan. Project engineer responsible for providing fire protection and life safety design along with integrated physical/electronic security upgrades for this task under the 5-year IDIQ contract for design services for expansion of the US Embassy. The project's final deliverable consisted of a standard US Department of State design-build RFP that includes a schematic level design along with other contractual documents for OBO use in contracting, planning, and procuring a design-build contractor to complete the project. Improvements include a 300-desk office building addition; two multi-story, secure housing units with 420 apartments; two new parking facilities, perimeter wall and compound access control components; and associated infrastructure improvements. [Fee $168,162]

Utah Department of Corrections, Gunnison Prison - Central Utah Correctional Facility, Gunnison, Utah. Fire protection engineer and fire modeling team leader for the code and design update of a new building for the 4-wing building, with a $1.1 million design, that houses inmates and includes day room facilities and support offices. Fire protection scope includes updates to fire suppression construction documents to comply with the latest state/local codes, life safety consulting services to in-house architects, and Computational Fluid Dynamics fire modeling services for a new performance-based smoke management system design. Performance-based smoke control analysis took egress, passive fire protection assemblies, and active fire protection system components of the building into consideration with the goal of a more streamlined system design that would reduce the size of the mechanical smoke control equipment and associated construction cost.

US Air Force Center for Engineering and the Environment, Visiting Quarters 882 Repair, Little Rock AFB, Arkansas. Fire protection discipline leader and consulting engineer for this renovation of 24,000-square-foot airmen's visitors' quarters (construction value of $4.26 million) at

Little Rock Air Force Base. Developed construction documents for fire suppression, including wet and dry pipe systems, and fire alarm, including mass notification. Completed hydraulic calculations and detailed design layouts for the sprinkler systems, along with complete shop-drawing level design documents, including voltage drop and battery calculations, for the fire alarm systems. This project was awarded under the 4P A-E08 AE Services 2008-2015 contract. [Design Completion: 2014; Total Fee for all disciplines: $459,700]

US Department of Health and Human Services National Institutes of Health, Chilled Water Capacity Expansion – Planning and Design Services, Bethesda, Maryland. Project engineer involved in fire protection strategic planning, design guidance/consulting, and quality control of the fire suppression, fire alarm, and life safety design for multiple new pump house buildings and associated underground water utilities on the NIH Bethesda campus. The project also included the design of a 6-story parking garage. The fire protection design included protection of storage/industrial occupancies and water modeling to achieve fire flows for existing buildings elsewhere on campus; in addition to fire suppression and fire alarm (detection, emergency communication, mass notification) systems design. Special attention was given to the demolition of an existing utility plant including a requirement to maintain existing fire alarm utilities going through the building. [Design Completion: 2016; Total Fee: $4.84 million & Total estimated construction cost: $73 million]

US Air Force Civil Engineer Center, Dorm 768 Repair and Reconfiguration, Little Rock AFB, Arkansas. Fire protection discipline leader and consulting engineer for this renovation of 24,000-square-foot airmen's dorm (construction value of $4.45 million) at Little Rock Air Force Base. Developed construction documents for fire suppression, including wet and dry pipe systems, and fire alarm, including mass notification. Completed hydraulic calculations and detailed design layouts for the sprinkler systems, along with complete shop-drawing level design documents, including voltage drop and battery calculations, for the fire alarm systems. This project was awarded under the 4P A-E08 AE Services 2008-2015 contract. [Design Completion: 2014; Total Fee for all disciplines: $410,100]

BP Products North America Inc, Health/Safety/Security/Environment (HSSE) Team Assessments and Third-Party Audits, Various Locations throughout North and South America. Fire protection and security assessor working in an audit team with safety, health, and environment consultants along with BP product, shipping and rail experts. The fire protection and security portion of the audit consisted of assessing terminals for fire protection and prevention compliance with National Fire Protection Association, American Petroleum Institute, and BP fire and security company standards. Also, emergency response and process safety management features relating to fire protection and security were evaluated. The contract involved numerous visits to various crude oil, fuel oil, and gasoline storage/transfer terminals throughout the Americas over multiple years. [Total Fee including Fire, Security and SHE: $175,000/year]

US Office of the Director of National Intelligence, Fire Pump Replacement Design, Fort Meade, Maryland. Project fire protection engineer overseeing architecture and multi-discipline engineering services

for this classified federal contract driven by a fire protection services scope. The AE team provided design and construction administration services to upgrade the fire pump installations of three existing buildings. The buildings included a 9-story, 517,000-square-foot building, a 10-story 939,100-square-foot building, and a 1-story, 1,275-square-foot building. This task included architecture, civil, mechanical, electrical, and fire protection services under the General Facilities Engineering IDIQ Contract. [Total Fee: $258,800; Total estimated construction cost: $1.8 million]

General Electric Measurement and Controls, Rubber Mixing and Manufacturing Facility, Humble, Texas. Fire protection discipline leader and consulting fire protection engineer for a new rubber processing facility. Responsibilities included design of the sprinkler system and fire alarm system. Due to the anticipated size of the facility (50,865 square Feet), extensive code consulting was involved to ensure that International Building Code and International Fire Consultants building criteria were met. The primary underwriter of the facility is FM Global, which required that the project be designed per FM Global's restrictive design criteria to mitigate fire risk. [Design Completion: 2014; Total estimated construction cost: $40 million; Total Fee for all disciplines: $1.13 million]

US Coast Guard - Civil Engineering North Carolina Branch, TISCOM Basewide Fire Alarm, Alexandria, Virginia. Project manager and consulting engineer for this fire alarm systems replacement for 10 buildings and retrofit for 16 buildings for radio fire alarm reporting to the proprietary monitoring station, with construction budget of $500,000. Integration of existing public address system as a mass notification system. Developed survey report and fire alarm designs, researched proprietary fire alarm products, and supervised interns/junior staff. [Total Fee: $97,000]

Valspar Corporation, Fire Protection Worldwide On-Call Consulting, Various Worldwide Locations. Global project manager and consulting engineer for this time and materials contract to provide on-call support for various fire protection/life safety related projects at Valspar global coating facilities. Support includes fire suppression/alarm design review/consulting, life-safety/building code analysis, hazardous chemical protection/storage analysis, fire protection systems installation recommendations, and related construction guidance. This fire protection on-call contract contained an estimated Fee of $60,000/year ending in 2015 with anticipated three-year term extensions mirroring those provided over the previous 20-year period of related safety, health, and environment consulting services under a master services agreement.

US Army Corps of Engineers Middle East, Fire Protection Design Review, Kabul, Afghanistan. Fire protection project engineer providing fire protection design support services to the project general contractor and fire protection sub-contractor. Reviewed fire protection operation and maintenance manuals for wet pipe, dry pipe, and preaction sprinkler systems. Developed acceptance testing plans including schedules and equipment lists.

US Army Corps of Engineers Middle East, Fire Protection Design Support Services, Various Locations. Fire protection project engineer providing fire protection design support services to the project general

contractor and fire protection sub-contractor. Reviewed fire protection operation and maintenance manuals for wet pipe, dry pipe, and preaction sprinkler systems for multiple US defense department sites in the Middle East. Developed acceptance testing plans including schedules and equipment lists. [Total Fee: $129,800]

US Air Force Civil Engineer Center, Building 128 Renovations, Fort Sam Houston, Texas. Fire protection consulting engineer and discipline leader responsible for a renovation and upgrade project of an existing 2-story building at Fort Sam Houston near San Antonio, for the US Air Force Civil Engineering Center. The building is to be retrofitted with a new sprinkler system and fire alarm/mass notification system. Responsibilities included hydrant flow testing, designing and coordinating the new sprinkler system with other disciplines, designing the fire alarm system and providing code consulting to the design team. Also produced the sprinkler and fire alarm specifications for the project using SpecsIntact. Project required knowledge of Unified Facilities Criteria, NFPA codes, IBC, and IFC. Drawings were prepared using AutoCAD software. Total square footage is 16,432. [Design Completion: 2014; Total Construction Cost estimate: $5.5MM; Total Fee for all disciplines: $254,400]

US Naval Facilities Engineering Command Mid-Atlantic, Marine Corps University Research Center Addition and Academic Instruction Facility, Marine Corps Base, Quantico, Virginia. Fire suppression, alarm, and life safety design oversight, review, and strategy development for Marine Corps University Building P541 and P632 building multi-discipline design project. Project building features include a 43,000 square-foot record archives storage facility, a 1,000-seat auditorium with stage, a 100,000 square-foot classroom building, an 80,000 square-foot open parking garage, and upgrade of Gray Research Center fire alarm system. Duties included fire alarm and mass notification system design, sprinkler system design, building code consultation, and life safety code consultation. Coordination with AHJs including Quantico Fire and Emergency Services, NAVFAC Washington, and National Archives and Records Administration (NARA). [Design Completion: 2014; Total Fee for all disciplines: $5,573,949]

City of Dickinson, Southwest Pipeline Project - New Dickinson Water Treatment Plant, Dickinson, North Dakota. Fire protection discipline leader and QA/QC reviewer responsible for oversight and preparation of the fire suppression design for a raw water treatment plant. Design challenges included protection of high hazard occupancy including high quantities of hydrogen peroxide, hydrochloric acid, and other hazardous liquids used in the water treatment process. Site included multiple buildings. [Fee: $85,000]

Riyadh Development Authority, Riyadh Metro System, Riyadh, Saudi Arabia. Fire protection QA/QC and fire protection design strategy development for fire alarm and fire suppression design for four underground metro stations in the new Riyadh Metro system including support and consulting to the project architect related to the life safety analysis. The project deliverables included multiple integrated Revit models, specifications, calculations, basis-of-design reports, and a detailed level of design necessary to generate a bill of material and quantity take-offs under Riyadh Metro Prime Contract #2. [Overall estimated construction cost: $20 billion]

US Department of State - Bureau of Overseas Buildings Operations, Chief of Mission Residence and Garden Historic Structures/Landscape & Disaster Preparedness Report, Paris, France. Fire protection discipline leader and project engineer responsible for assessing this historic US ambassador's residence in Paris, France. Developed the fire protection and life safety portion of a survey report, cost estimate of recommendation options, and risk-based fire protection analysis; a compilation of survey notes were used to generate a presentation that combined the joint venture lead architectural firm and our multi-discipline engineering team members recommendations to the US Department of State stakeholders. Fire protection scope included assessing the existing level of fire protection inside and outside the building and developing a performance-based, holistic, fire protection strategy for protection of the building and its occupants without damaging or degrading the historic fabric of the facility. Special attention was made to risk-based/cost/benefit aspects of fire protection and prioritization for implementation of recommendations were generated based on the greatest amount of fire protection, property protection via physical security compliance and associated passive protection strategy against attack by arsonist, and life safety for the least impact to the aesthetics and diplomatic function of the facility. [Total project Fee: $700,000]

Xerox, Environmental, Health, and Safety National Fire Protection Association Reviews, Various USA Locations. Lead fire protection engineer responsible for managing a team of fire protection engineers reviewing standardized survey and as-built information and generating an NFPA 101 life safety and fire protection facilities evaluation for multiple Xerox leased facilities worldwide. Time from task issue to review delivery was typically 48 hours or less, and generally multiple sites were assigned concurrently. [Fire protection Fee $20,000 per year]

US Department of Justice, Federal Bureau of Investigation, Life Safety Upgrades, Quantico, Virginia. Quality Assurance / Quality Control and fire protection design strategy development for this life safety assessment and upgrade design project. This project task order was awarded under the FBI Worldwide Federal On-site APE Services contract. [Design Completion: 2015]

California Department of Corrections and Rehabilitation, Ironwood State Prison, Blythe, California. Lead fire protection engineer for a fire protection and life safety study to determine the present status of the fire protection and security intrusion detection (including personal alarm) systems and provide recommendations for remediation and improvement of institution-wide and program-wide fire protection deficiencies. This project included a cursory assessment and strategy development for budgeting and scheduling future design phase services. [Fee for initial planning phase: $10,000; Design Completion: 2016]

US Department of State, Embassy Tactical Operations Center Expansion, Kabul, Afghanistan. Quality Assurance / Quality Control and fire protection design strategy development for this operations center design project. [Design Completion: 2015]

US National Reconnaissance Office, MS&O Basic Ordering Agreement 2008-2016 - Destiny Design, Springfield, Virginia. Quality Assurance / Quality Control for fire protection on this high security facility design IDIQ contract task orders. Classified scope. [Design Completion: 2016]

Broward County, Broward County Courthouse, Fort Lauderdale, Florida. Quality Assurance / Quality Control oversight for this project consisting of design review and systems recommendations for design of a new fire suppression system for an existing high-rise courthouse. Design features included a fire pump and tamper-proof components located in holding cells. [Design Completion: 2013]

US Army Corps of Engineers Middle East, Contrack International, 270 Bahrain Phase III, Various Locations throughout Bahrain. Fire protection project engineer providing fire protection design support services to the project general contractor and fire protection sub-contractor. Reviewed fire protection operation and maintenance manuals for wet pipe, dry pipe, and preaction sprinkler systems. Developed acceptance testing plans including schedules and equipment lists.

US Department of State - Bureau of Overseas Buildings Operations, Camp Eggers - Security Force Relocation, Kabul, Afghanistan. Quality Assurance / Quality Control and fire protection and security design strategy development for this design project for a highly secure facility in hostile territory. [Design Completion: 2016]

US National Guard Bureau, Air National Guard Design Policy Engineering Technical Letters (ETL) Revisions, Camp Springs, Maryland. Quality Assurance / Quality Control engineering restructuring and updating of Air National Guard facilities design criteria documentation. [05/2012-05/2013]

US General Services Administration - Mid-Atlantic Region 3, Social Services Administration Load Center Transformer Replacement, Baltimore, Maryland. Quality Assurance / Quality Control and fire protection design strategy development for this large electrical room design project. [Design Completion: 2016]

Stony Brook University Hospital, Medical & Research Translation Building Renovation, Stony Brook, New York. Quality Assurance / Quality Control and fire protection design strategy development for this hospital design project. [Design Completion: 2016]

Qatar FIFA 2022 World Cup Supreme Committee, Al Wakrah Stadium, Al Wukair, Qatar. Quality Assurance / Quality Control and strategic planning for fire protection design of a stadium for the 2022 international soccer tournament. Project was completed by an international partnership of our United States, Middle East, and European offices' design teams. Detailed design and completion of hydraulic calculations was completed by the United States fire protection engineering team. [Design Completion: 2015]

Joint Replacement Hospitals of America (JRHA), New Outpatient Facility - Initial Program, Indio, California. Quality Assurance / Quality

Control and fire protection design strategy development for this hospital design project. [Design Completion: 2016; Construction Completion: Estimated 2018]

Regional Municipality of York, Water and Wastewater Master Plan Update, Newmarket, Ontario, Canada. Quality Assurance / Quality Control and fire protection design strategy development for this water systems analysis and master plan report which was used as a baseline for mater planning and budget allocation in Ontario. [Design Completion: 2015]

Confidential Client, Manufacturing Facility Improvements, Houston, Texas. Quality Assurance / Quality Control and fire protection design strategy development for this spark detection system design project. [Design Completion: 2015]

Kansas City Southern Mossville Railyard Expansion, Mossville, Louisiana. Fire protection project manager for the design of multiple new administration and industrial facilities within the Mossville rail yard for Kansas City Southern Rail Lines. Conducted code analysis, edited specifications, and created drawings for four separate buildings, and provided customer support for the permitting process. [04//2015-03//2016]

Project Wolfpack, San Francisco, California. Quality Assurance / Quality Control and fire protection design strategy development for fire protection systems design support and life safety design for this high value battery manufacturing facility for a confidential automotive industry client. [Design Completion: 2015]

NBC Universal - Orlando, Universal Studios Hollywood - Fast and Furious, Hollywood, California. Fire protection engineer of record responsible for fire protection construction documents including sprinkler and fire alarm system designs for a new attraction ride in the park. The new ride was designed as an 80,000-square-foot facility on the existing campus and built under an aggressive construction schedule with our firm providing construction administration services. Assignments included interaction with all building system engineers, architects, and BIM processes. One of the project's main challenges was providing fast response on evolving designs of the ride show elements.

US Army Engineering and Support Center Huntsville, Fire Alarm & Fire Suppression, Seoul, South Korea. Fire protection engineering team leader for this multi-team assessment project in the Yongsan Garrison, U.S. Army Headquarters, for U.S. operations in Korea. Project scope of work includes a holistic fire protection assessment of a cross section of different types of occupancies and uses of facilities within the army base. The assessment report was used to prioritize and generate a basewide maintenance contract for the fire protection systems. This project was awarded as a task order under the Utility Monitoring & Control Systems IDIQ Contract. [Design Completion: 2015]

US National Guard Bureau, California Air National Guard Building, Channel Island Air National Guard Station, Oxnard, California. Quality Assurance / Quality Control and fire protection design strategy development for this ANG SCIF design project. Personal involvement included flow test

analysis and report development as well as fire protection engineering strategy and scope development for this suite renovation project within an existing ANG facility. This project was awarded as a task order under a National Guard Bureau AE IDIQ contract. [Design Completion: 2016]

US National Guard Bureau, Fuel Cell Hangar Replacement, New Castle, Delaware. Quality Assurance / Quality Control and fire protection design strategy development for this hangar renovation design project. [Design Completion: 2016]

Metropolitan Washington Airports Authority, Ronald Reagan Washington National Airport, Terminal B-C Long-Term Development, Arlington, Virginia. Quality Assurance / Quality Control and fire protection design strategy and scope development for this airport renovation project. [Design Completion: 2016]

Maryland Transit Administration, Stat-X Replacement Mechanical & Electrical Engineering Services, in and around the Baltimore, Maryland Area. Quality Assurance / Quality Control and fire protection design strategy development for clean agent system design throughout the MTA high value facilities. [Design Completion: 2016]

Shell Oil Products US, Liquefied Natural Gas Supply Construction Project Management Services, Denver, Colorado. Quality Assurance / Quality Control and fire protection negotiation services related to construction permitting and authority having jurisdiction requirements on this ongoing oil and gas industry construction project. [Design Completion: 2015]

Dominican Retreat, Fire Alarm Upgrade and Construction Management, Fairfax, Virginia. Project Manager and lead Project Engineer provide fire alarm system engineering design services including conformance with the local requirements of Fairfax County, VA and best practices related to fire alarm, life safety, and building code requirements. The base scope included full fire alarm system design and associated construction administration services limited to within the Dominican Retreat facilities including all connected structures: Nun's quarters and residential building, administrative offices and public assembly with religious worship building, and four-story dormitory style retreat building for guests. Construction management services for this project included fire protection and electrical consulting services Dominican Retreat consisting of comprehensive Construction Administration services closely resembling the construction period portion of a CM "Agency" type Construction Management contractual arrangement or delivery method in which the owner's representative is involved minimally in the detailed administration of the construction process lead by the construction manager. The scope also included general fire protection (alarm and suppression), building code, and life safety consulting throughout the project. [Total Fee: $30,000; Construction Completion: 2012]