

Curriculum Vitae

JOSHUA DRAKE, PE, CEM, MSME

HVAC/MEP Engineer

Federal, Commercial, and Residential Build Design
Expert

Project Manager

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Summary of MEP Engineer Expertise

13 years' experience in HVAC and MEP engineering. Engineering and construction project management for Department of Defense, and expertise in seeing construction projects through the building life cycle. Expert in HVAC, and Mechanical, Electrical and Plumbing (MEP) Engineering.

Specialties

- **MEP Engineer**, federal, commercial, and residential design build. Experienced in managing complex building design and construction projects across building life cycle.
- **Project Manager**, this includes completing comprehensive facility inspections, project identification and selection, deconstruction and demolition, site identification, facility design from 0 to 100% and as-built finalization, project scoping, proposal and technical reviews, project awards, and complete project management.
- **Energy, Water, and Resource Management**, providing comprehensive resource management solutions through the execution of large-scale facility condition assessments

and energy reduction consulting for mission-critical infrastructure for federal and military installations.

- **Contractor Evaluation**, Contract Review, Contractor Standard of Care, Engineering Evaluation, Site Inspections, and Retro commissioning.
- **Structural Analysis**, ranging from the design of custom mechanical equipment, building foundations and structure, and Finite Element Analysis (FEA) of load paths and modes of failure.

Recent Assignments

- **US Army, Ft. Carson, CO: BUILDER™ SMS Facility Condition Assessments**, as the Technical Lead and Senior Mechanical Engineer for the BUILDER™ Facility Condition Assessment (FCA) at Fort Carson, directed the technical execution and quality management of evaluated facilities in accordance with the AFCEC SMS Playbook. Managed a multidisciplinary team of mechanical, electrical, architectural, and plumbing assessors to perform data collection, inventory, and property validation for 13 required UNIFORMAT II systems. Duties included performing direct condition assessments for all non-concealed mechanical systems and validating legacy BUILDER™ records to ensure a high-fidelity dataset.
- **US Army and Stevens Institute of Technology, Net Zero and Resilience Applications for the Army's Industrial Base Facilities**, as the Project Manager for this project, oversaw high-level research and development processes by Stevens Institute of Technology for their work on multiple sustainable technologies and Net Zero energy and resource efforts. This included managing project schedules and timelines, working with SEA Solutions' Project Manager to accomplish objectives, and performing site visits to project locations for coordination of shipping, placement, and installation of an ANSOL low-emissions reactor.
- **Oregon Military Department (OMD), Comprehensive Energy and Water Plan (CEWE)**, as the technical lead and energy engineer, Mr. Drake conducted a statewide energy and water infrastructure assessment for the Oregon Military Department (OMD), evaluating National Guard facilities across 17 locations. He performed on-site energy audits, utility data analysis, and facility condition assessments to identify inefficiencies in HVAC systems, electrical distribution, water usage, and renewable energy integration potential. His work included developing energy conservation measures (ECMs), assessing microgrid feasibility, and recommending system upgrades

to enhance energy resilience and operational efficiency. He compiled findings into a Comprehensive Energy and Water Plan (IEWP), ensuring alignment with DoD sustainability goals, state energy mandates, and Army and Air Force National Guard energy resilience requirements. His efforts provided a strategic roadmap for the modernization of OMD's critical infrastructure, focusing on cost-effective energy savings, water conservation strategies, and long-term sustainability initiatives.

- **Davis-Monthan AFB F-16 Laser DE painting Facility**, developed a detailed scope of work to meet requirements from stakeholders, UFCs, and local requirements. Created detailed cost estimate, to include facility renovations, water, mechanical, and electrical systems, as well as updated fire protection equipment, pipes, sprinklers, and related assemblies. Worked with multiple project stakeholders across the project purview, including Safety, technical shops, Fire Protection, City of Tucson permitting office, Contracting Officer and Administrator, and the project contractor
- **USAF 53rd Rescue Group Rescue Equipment Storage Facility**, as the Project Manager and Mechanical Engineer for the Air Force, reviewed project requirements with the customer, developed a complete scope of work and comprehensive cost estimate for site preparation, excavation, utilities, and facility construction, including HVAC, fire protection, and all related services. Managed project planning with an interdisciplinary installation management group. Managed schedule, budget, and scope. Conducted regular site visits, permitting, airfield safety compliance and safety management, quality control, and managed contractor and USAF Contracting Office relations. Managed all aspects of project execution as they pertained to the USAF, 53rd Rescue Squadron Command and overall site safety, access, and quality controls.
- **US Army, Fort Huachuca, AZ, US Army Pool Dehumidification System**, as Installation Mechanical Engineer, provided engineering design review, consulting, and troubleshooting for a dehumidification system installed at an Olympic sized pool located at Fort Huachuca, AZ. Provided a full review of the installed equipment and provided engineering recommendations regarding possible solutions when it turned out that the system was not installed correctly. Determined that the root cause of failure was an installation oversight related to an oversized hot water boiler which had been in service past its full life cycle. Recommended the installation of a small, dedicated boiler, as well as an overhaul, repair, and replacement of the existing hot water heating system.
- **U.S. Army Fort Huachuca: Military Police (MP) Group Building Renovation**, Provided comprehensive design to 35% renovating interior offices, building HVAC/MEP design according to ASHRAE , constructing holding cells, structural requirements for armory and security forces, police and personnel access, HVAC,

electrical and fire protection requirements. Corresponded with the Fort Huachuca MP Group command and civilian leadership to develop a complete scope of work.

- **U.S. Army Fort Huachuca: Commissary QC Design Review**, provided design support to colleagues in design for renovation of 80,000 square foot post exchange, food court, and shopping mall. Reviewed project design drawings, including HVAC, plumbing, structural, and electrical. Verified project parameters and conducted a specification review to ensure adherence to technical and code requirements
- **US Army, Fort Huachuca, AZ, HVAC Repair by Replacement for Child Development Center**, as Project Manager and Mechanical Engineer, corresponded with facility personnel and leadership to develop complete project requirements. Developed a comprehensive scope of work and cost estimate for complete removal and replacement of facility HVAC system. Conducted proposal technical reviews, ongoing technical drawing and design oversight and change management. Conducted multiple site visits to oversee project execution and completion while the facility was still in operation, maintaining a strict after-hours/weekend construction schedule. Worked with prime contractor and subcontractors for selective deconstruction, civil site preparation, phase-by-phase execution, system Testing and Balancing (TAB), Duct Air Leakage Testing (DALT), and final system commissioning, all while maintaining strict child-safety guidelines.
- **Grand Coulee Dam 5,000 GPM Drainage Pump**, analyzed, designed, and managed installation of a 5,000 GPM pump for penstock drainage. Performed system analysis to size high efficiency pumps, motors, and parts. Integrated visconite, greaseless bearings to eliminate oil contamination of water. Oversaw purchasing, shipping, and transfer of pump to existing powerhouse
- **Grand Coulee Dam, Inspection, Troubleshooting, and Recommendations for a 75 Ton Overhead Gantry Crane**, provided detailed inspection of all equipment, machinery, assemblies, and parts in a 75-ton overhead gantry crane installed in the 1940's. Executed troubleshooting of the crane and review of historical documentation and determined that the wrong lubrication had been added to the crane for the past decade. Identified significant amount material loss from gear teeth which drove the crane's steel drums. Extrapolated the results and determined that the crane required replacement as soon as possible. Produced and submitted a detailed report to the Grand Coulee Dam Supervisory Group. Recommendations were reviewed and it was determined that new cranes would be installed throughout the dam.
- **Grand Coulee Dam, 3D Design, Analysis, and Project Management for Installation of a 2-Ton, Tracked, Overhead Gantry Crane**, developed a full 3D model of a full range of motion, 2-ton overhead gantry crane using AutoDesk Inventor

Performed structural analysis of the crane components using Finite Element Analysis (FEA). Procured all parts upon approval of the project installation. Submitted detailed assembly drawings to the Machine Shop and met with stakeholders to establish project parameters. Provided Project Management for the installation of the crane and performed testing to validate its design and use.

Certifications

- **Professional Engineer, AZ; #77932**
- **Certified Energy Manager (CEM)**
- **OSHA 30-hour Construction Safety Certification**

Education

- **Master of Science in Mechanical Engineering (MSME)**, May, 2014, Northern Arizona University, Flagstaff, AZ
- **Bachelor of Science in Mechanical Engineering (BSME)**, May, 2012, Northern Arizona University, Flagstaff, AZ

Published Media

- Graduate Thesis: Hybrid PV-Diesel Solar Power System Design Integrated with Multi-Level Factor Analysis

Past Employment

- **Sr. Mechanical Engineer/Technical Lead – Stell Environmental, April 2022 – September 2025**
Managed design projects and coordination across process life cycles. Managed multiple construction projects as Project Manager and Mechanical Engineer. Performed research and development in AI, Machine Learning, and Digital Twins for building optimization. Performed facility assessments on a large range of building types, including Federal and Commercial. Provided support in business development, team building, and technical consulting.
- **Web Developer – JP Drake Enterprises, LLC – Yuma, AZ, March 2021 – April 2022**
Designed, Built, and Managed several client websites. UI/UX development, including responsive design and information architecture.

- **Construction Project Manager/ MEP Engineer – BB&E, Inc., Davis-Monthan AFB, AZ, November 2018 – March 2021**
Managed multiple construction projects as Project Manager and Mechanical Engineer. Completed technical reviews of structural, thermal, and mechanical designs. Developed technical Scopes of Work for US Air Force contracting services.
- **Construction Project Manager/ MEP Engineer - US Army, Fort Huachuca, AZ, February 2015 – February 2018**
Completed comprehensive training program in general engineering and maintenance. Designed and inspected Fire Suppression Systems, HVAC Systems, and Green Buildings. Developed technical Scopes of Work for US Army contracting services.
- **Infantryman – US Army, October 2001 – September 2003**
Trained in ground warfare strategies as a combat soldier with the US Army Infantry, 10th Mountain Division.

Professional Training Certifications

- **Air Force Institute of Technology, High Performance and Sustainable Requirements**
- **Air Force Institute of Technology, Project Management**
- **Air Force Institute of Technology, Facility Electrical Power Systems Design**
- **Air Force Institute of Technology, HVAC Control Systems**
- **Air Force Institute of Technology, Applications of HVAC Design and Analysis**
- **Air Force Institute of Technology, Roofing Design and Management**
- **US Army Corps of Engineers, HVAC Control Systems Design**
- **US Army Corps of Engineers, Lubrication of Mechanical Equipment**
- **US Army Corps of Engineers, HVAC Systems Commissioning**
- **US Army Corps of Engineers, Concrete Maintenance and Repair**
- **US Army Corps of Engineers, Master Planning Guideline Implementation**
- **US Army Corps of Engineers, Master Planning Program Execution**
- **US Army Corps of Engineers, Value Engineering**
- **US Army Corps of Engineers, Advanced Surveying and Processing**
- **US Army Corps of Engineers, Fire Suppression Systems Engineering**
- **Trane, Air Conditioning Service**
- **Trane, RTAE Rotary Chiller**
- **RS Means, Facilities Construction Estimating**
- **Claim Academy, Full Stack Java Programming**