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SUMMARY

Civil engineer with 21 years across design, construction, and quality assurance on heavy civil infrastructure. Primary QA/QC leadership and concrete specification ownership for the Metropolitan Water Reclamation District of Greater Chicago's capital improvement program across its scaling from $339M in 2018 to $855M in 2026 — more than 2.5× growth in eight years, with sharp acceleration after 2022 as major capital projects (including the $368M O'Brien WRP secondary treatment battery) entered active construction. Run the four-person in-house QA/QC section with specialty consultants, covering metals, concrete, protective coatings, and soils. Track record of modernizing long-stagnant programs: first MWRD concrete specification rewrite since 2002, in-house materials lab pointed at AMRL/AASHTO accreditation, elimination of a decades-old agency radioactive-materials license, single-handed launch of the UAS/drone program, and a multi-LLM adversarial review pipeline currently being built for submittal review. Licensed Professional Engineer in Illinois and California; AMPP Senior Coatings Inspector, AMPP Protective Coatings Specialist, and AWS Certified Welding Inspector.

SELECTED IMPACTS

- 5× per-capita submittal review throughput (pre-AI internal benchmark) vs. peer internal review functions.
- ~$6,000/yr direct savings plus eliminated self-insured liability by replacing nuclear density gauges with Troxler 4540 eGauges and sunsetting a decades-old agency radioactive-materials license.
- ~20% ongoing cost reduction via an ACI-compliant concrete cylinder storage system that brought the program into full compliance.
- $15,000+/yr personal investment in critical testing and inspection equipment out of pocket to bridge gaps agency procurement could not move fast enough to cover during rapid CIP growth.

PROGRAM SCOPE

MWRD Capital Improvement Program appropriations — scaled from $339M in 2018 to $855M in 2026 (more than 2.5× growth, sharp acceleration after 2022). Figures from MWRD Budget in Brief / adopted budget documents, publicly available on mwrd.org:

- 2026 CIP appropriation: **$855M**
- 2024 CIP appropriation: **$495M**
- 2023 CIP appropriation: **$482.4M**
- 2022 CIP appropriation: **$313.9M**
- 2021 CIP appropriation: **$325.9M**
- 2020 CIP appropriation: **$262.6M**
- 2018 CIP appropriation: **$339M**
- QA/QC section headcount supporting the program: **4 in 2025–2026 (3 in 2024)** — one engineer, one technician, plus Coordinator; specialty consultants fill gaps.
- Preliminary 2025 internal productivity benchmark (pre-AI, submittal reviews only): **two-person QA/QC review team delivered roughly 5× per-capita submittal throughput vs. peer internal review functions — likely a conservative figure**. Submittals reviewed by QA/QC were materially more technical in content.

EXPERIENCE

Metropolitan Water Reclamation District of Greater Chicago — Chicago, IL *May 2008 – Present*

Quality Assurance / Quality Control Coordinator *December 2017 – Present*

Lead the Quality Control section. Inspection and testing support for field crews across metals, concrete, protective coatings, and soils. Responsible for specification development covering protective coatings, concrete, and quality control on all MWRD construction contracts. Manage consultant contracts and procurement for concrete, protective coatings, welding, and geotechnical specialty services. Review contract documents for protective coatings, concrete, asphalt, welding, and geotechnical content prior to public advertisement.

- First QA/QC inspector at MWRD (to my knowledge) to personally hold AWS Certified Welding Inspector, AMPP Protective Coatings Specialist (PCS, Level 3), AMPP Concrete Coatings Inspector Level 2, and IDOT Hot Mix Asphalt Level 3 credentials. Closed long-standing gaps where MWRD had previously depended entirely on third-party consultants for these disciplines.
- Led the first major concrete specification rewrite at MWRD since 2002 — shifted the agency from a prescriptive, agency-specific standard to a performance-based specification aligned with ACI. Improved industry compliance and opened the door to modern concrete technology.
- Led full implementation and proactive management of Portland Limestone Cement (Type 1L) across MWRD construction, with particular attention to potential attack vectors unique to the wastewater industry. Coordinated with local producers on availability, scheduling, and specification adherence, supporting MWRD's net-zero emissions goal while managing durability risk for a self-insured owner.
- Standing up an in-house MWRD concrete materials testing laboratory. Specified and procured the full equipment suite — Humboldt compression machine, companion cylinder end grinder, curing infrastructure, and ancillary apparatus — with the goal of bringing the MWRD lab into AMRL / AASHTO accreditation. Builds on-site capability for cylinder testing and durability-specimen preparation that previously required outsourcing.
- Replaced legacy nuclear density gauges with Troxler 4540 eGauges, eliminating a decades-old agency radioactive-materials license. Approximately $6,000/year in direct savings plus removed liability exposure for a self-insured entity.
- Designed and implemented an ACI-compliant concrete cylinder storage system, bringing the program into full compliance and producing an estimated 20% ongoing cost reduction against contract value.
- Stood up MWRD's UAS (drone) program end-to-end — aircraft procurement, FAA Part 107 authorization, standard operating procedures, and field deployment for QA/QC documentation. Rolled out single-handed.
- Introduced Microsoft Teams across the QA/QC section in 2019 — ahead of broader agency adoption — alongside dedicated QA/QC tracking software that streamlined inspection workflows.
- Centralized forecasting of section-wide certifications, training, budget, and equipment needs. Replacement costs have fallen since implementation; in-house repair and calibration keep division testing equipment current without budget increases.
- Personally funded approximately $15,000 per year in critical testing and inspection equipment out of pocket to bridge gaps agency procurement could not move fast enough to cover. Not sustainable at current program scale (CIP exceeding $855M).
- Designing and rolling out a full AI-assisted review system for MWRD QA/QC — multi-platform adversarial review (Claude, ChatGPT, Gemini, Grok, Perplexity) for submittals and contract documents, combined with custom Python and Claude Agent SDK skills for welding, coatings, concrete, and project-triage workflows. MWRD does not currently track review-throughput metrics; building that measurement in alongside the tooling.
- Proposing a 10-year concrete durability longitudinal study with a UIC faculty team and a coordinated funding proposal. Paired AI/ML implementation for specimen data analysis, environmental-exposure tracking, and

in-service performance prediction across wastewater-specific attack vectors (biogenic sulfuric acid attack / microbially induced concrete corrosion and sulfate attack). Built on the new in-house concrete lab; ties directly to self-insured durability risk on Type 1L and other low-CO_2 binders.

Construction Field Engineer *2011 – 2017*

Field engineering on major MWRD capital improvement contracts. See Selected Projects.

Design Engineer, Tunnel and Reservoir Project (TARP) Section *2008 – 2011*

Hydraulic and structural design on MWRD's deep-tunnel system. See Selected Projects.

EarthTech — Chicago, IL *2006 – 2008*

Construction Field Engineer

Inspection oversight for heavy civil and transportation projects. Coordinated QA/QC inspections for 400+ of 616 prestressed, post-tensioned bulb tee beams produced for the Des Plaines River Valley Bridge. See Selected Projects.

SPACECO, Inc. — Rosemont, IL *2004 – 2006*

Design Engineer

Site civil design for residential, commercial, industrial, and roadway projects. Prepared cost estimates, permit applications, earthwork analyses, grading plans, utility layouts, details, specifications, and profiles. Designed storm sewer, sanitary sewer, and water main improvements; sized detention and compensatory storage facilities. Oversaw construction inspection. Projects included Cherry Hill Business Park, Joliet Crossings, Poplar Woods Subdivision, Des Plaines Mannheim LLC Retail Development, Ironworkers Union Facility, Deer Haven Subdivision (Orland Park), Messenger Woods Subdivision (Homer Glen), and the Village of Inverness Pavement Maintenance Program.

Harry O. Hefter-Associates Inc. — Chicago, IL *2001 – 2003*

Field Inspector

Inspected contractor and subcontractor work on urban transportation projects, identifying traffic protection, public and worker safety, and quality concerns. Maintained Inspector's Daily Reports and field books. Projects: Chicago Skyway 106th Street Viaduct Eastbound Reconstruction; Western Avenue resurfacing (Addison to Howard); Ashland Avenue resurfacing (39th to 95th).

University of Illinois at Chicago — Chicago, IL *2001 – 2004*

Concrete Lab Assistant

Supported research on rehabilitating and strengthening bridge girders with carbon fiber-reinforced polymer, and on latex-modified concrete for bridge deck overlays. Built and tested specimens; assisted PhD and graduate students with research projects.

SELECTED PROJECTS

MWRD — Design and Construction

- **39th Street Conduit Rehabilitation – Phase I Bypass Tunnel** ($154M). Design and construction of ~14,470 LF of 15-ft ID lined tunnel with connection to an existing TARP stub; six lined drop shafts (7–20 ft dia., 227–250 ft deep), a vent shaft, six connecting structures, three backflow gate structures, entrance conduit structures, manholes, gate replacements, and louver additions at 25 existing MWRD drop shafts.
- **O'Brien (North Side) WRP UV Disinfection Facility, MWRD Contract 11-054-3P** ($61.7M construction). Associate Civil Engineer, September 2013 – December 2017. 450 MGD, 896-lamp low-pressure high-output UV system — largest wastewater UV installation in the world; serves 1.3M people across 143 sq mi. Acted as assistant Resident Engineer: directed daily field activities, scheduled field inspectors, and personally conducted QA/QC inspections. Following the May 17, 2015 failure of the open-cut support-of-excavation system — which compromised the CTA Yellow Line embankment and suspended Yellow Line service for five

months — led the forensic retrieval of the failed structural steel retention system; coordinated with the contractor (Walsh Construction), CTA, and investigators on recovery sequencing, evidence preservation, and safe re-excavation. Facility commissioned Spring 2016 and received the 2017 ACEC-Illinois Honor Award.

- **McCook Reservoir Des Plaines Inflow Tunnel** ($31.3M). Construction of ~5,700 LF of 20-ft dia. concrete-lined tunnel connecting the Des Plaines Tunnel System to McCook Reservoir. Gate shaft with primary and backup gates, gate control building, temporary access shaft, tunnel portal, high-wall stabilization, energy-dissipation apron with baffle blocks, demolition of existing tunnel plug, live connection to the operating Des Plaines system, and reservoir-level and inflow instrumentation.
- **McCook Reservoir Expanded Stage 2 Slope Stabilization Retaining Walls** ($8.9M). Resident Engineer for ~2,300 LF of soil nail retaining wall along the western and southern sides, plus perimeter slope stabilization.
- **Final Reservoir Preparation – Thornton Composite Reservoir** ($53.9M). Design and construction of a 20-ft dia. concrete-lined connection tunnel from the Diversion Tunnel to Thornton Composite Reservoir. Drop shaft, deaeration chamber, tunnel portal, high-wall stabilization, energy-dissipation apron, and two reinforced-concrete tunnel plugs.
- **North Branch of Chicago River Restoration, Montrose to Berteau** ($3.2M). Resident Engineer for barge-delivered installation of 1,300 LF of sheet pile wall, articulated concrete block mat, rip rap, and backfill. Giken hydraulic pile-jacking machine used for sheet pile installation.
- **TARP Modeling — Phases I & II, Mainstream and Calumet Systems**. Managed development of updated computer models to simulate rainfall events, optimize operations, identify constraints, recommend physical improvements, and run storm-scenario analyses across local sewers, intercepting sewers, and the deep-tunnel system.

EarthTech

- **Des Plaines River Valley Bridge Design-Build (I-355 South Extension, Lemont, IL)** ($125M, Illinois State Toll Highway Authority). Field Inspector for a 1.3-mile spliced bulb tee bridge — Illinois's first post-tensioned spliced bulb-tee girder bridge and the 2nd-longest bridge in the state. 34 piers, 616 beams: 90-in prestressed girders on simple spans up to 170 ft, 102-in post-tensioned spliced segmental girders on 216-ft spans, and 120-in haunched pier segments with 102-in drop-in girders on 270-ft main spans. Girders among the largest post-tensioned precast beams in the U.S. by length and weight (up to 256,000 lb). Coordinated precast yard QA/QC for prestressed, post-tensioned concrete beams. Crossing spans two roadways, two railroads, a river, two canals, and wetlands with endangered species.
- ACEC-Indiana Engineering Excellence "Honor" Award (2009), via Janssen & Spaans Engineering. Featured in ASPIRE Magazine, Spring 2008.
- **FAU Route 1441 William J. Donovan Bridge over Fox River, Batavia, IL** ($9.6M). Field Inspector for replacement of a 3-span reinforced filled spandrel arch with a 3-span variable-depth continuous CIP post-tensioned slab; micropiles, post-tensioned piers and deck, architecturally enhanced walls with form liners.
- **FAP Route 361 (New Stearns Road) Bridge, South Elgin, IL** ($1.8M). Field Inspector for a 168-ft 2-lane highway bridge with single pier, two spans, and integral abutments; earth excavation for New Stearns Road under Route 31.
- **Wabash Loop Street Lighting, Wacker Drive to Harrison Street, Chicago, IL** ($1.7M). Field Inspector for historic custom lighting, vaulted sidewalk reconstruction, scored and colored sidewalks, underground electrical duct banks, utility adjustments, streetscape features, CTA "L" structure cleaning and painting, roadway resurfacing, and public-relations coordination.

EDUCATION

- **Master of Science, Construction Engineering and Management** — University of Illinois at Chicago. *In progress; degree conferral expected May 2026.*

- **Doctoral studies (planned)** — continuing at UIC; approximately one semester of remaining coursework before transitioning to research. Research phase structured to support remote execution.
- **Bachelor of Science, Civil and Materials Engineering** — University of Illinois at Chicago, 2004.

PROFESSIONAL LICENSES

- **Professional Engineer, State of Illinois** — #062061516
- **Professional Civil Engineer, State of California** — #80906

CERTIFICATIONS

- **AMPP Senior Coatings Inspector** — #106911
- **AMPP Protective Coatings Specialist** — PCS 2024-117-531
- **AMPP Concrete Coatings Inspector Level 2** — CCI 115066
- AMPP C5 — Supervisor Competent Person Refresher, Deleading / Hazardous Coatings — March 2026
- **AWS Certified Welding Inspector** — CWI #25012451
- **FAA UAS Remote Pilot** — #4941887
- **OSHA 30-Hour Construction Safety and Health** — #20-602229723, January 2026
- **MSHA Part 48 New Miner Training (24-Hour, Surface Metal/Nonmetal)** — September 2025
- **ACI Self-Consolidating Concrete Testing Technician** — November 2024 (valid through November 2029)
- **ACI Concrete Field Testing Technician — Grade I** — December 2023 (valid through December 2028)
- **Illinois DOT Hot Mix Asphalt Level 3** — 2025
- **Illinois DOT QC/QA Aggregate Technician** — 2006
- **Illinois DOT QC/QA Nuclear Density Technician** — 2006

TECHNICAL TOOLS

- **Engineering & construction software:** eBuilder, Trimble, Omnant, AutoCAD, MicroStation, Constructware.
- **Hydraulic & hydrologic modeling:** Hydraflow, SWMM, HY-8, HEC-RAS, TR-20, Paydirt.
- **Data science & machine learning (UIC CME 594):** Python (Spyder, scikit-learn); supervised learning — logistic regression, SVM, decision trees, random forest, gradient boosting; neural networks (MLP, CNN, LSTM); unsupervised — K-means, PCA, feature selection; NLP — TF-IDF, LDA topic modeling, NMF; Gaussian processes; SHAP interpretability; cross-validation and ROC/AUC evaluation.
- **Frontier LLMs for engineering review and QA:** Claude, ChatGPT, Gemini, Grok, Perplexity — applied to multi-platform adversarial document review.
- **Productivity:** Microsoft Office including Teams.

HONORS

- **Eagle Scout**, Boy Scouts of America — March 1999

REFERENCES

Available on request.