



EI&C CAPABILITIES & SERVICES

Electrical, Instrumentation & Controls Engineering for Water and Wastewater Utilities

Canfield Engineering & Integration, LLC (CEI) provides electrical, instrumentation, and controls (EI&C) engineering and SCADA/PLC/RTU system integration for water and wastewater utilities. CEI carries work from condition assessment and design through programming, panel design and fabrication oversight, commissioning, and startup with a single in-house team, and continues to support the facility through on-call services after the project closes out.

Because the same firm develops the design, writes the control logic, and commissions the system, CEI retains knowledge of the utility's facilities and standards over time. CEI staff has worked together for decades across water, wastewater, and related infrastructure, and most designers and programmers have hands-on field experience operating and starting up the systems they design.

40+

STAFF MEMBERS, INCLUDING 8
P.E.s

250+

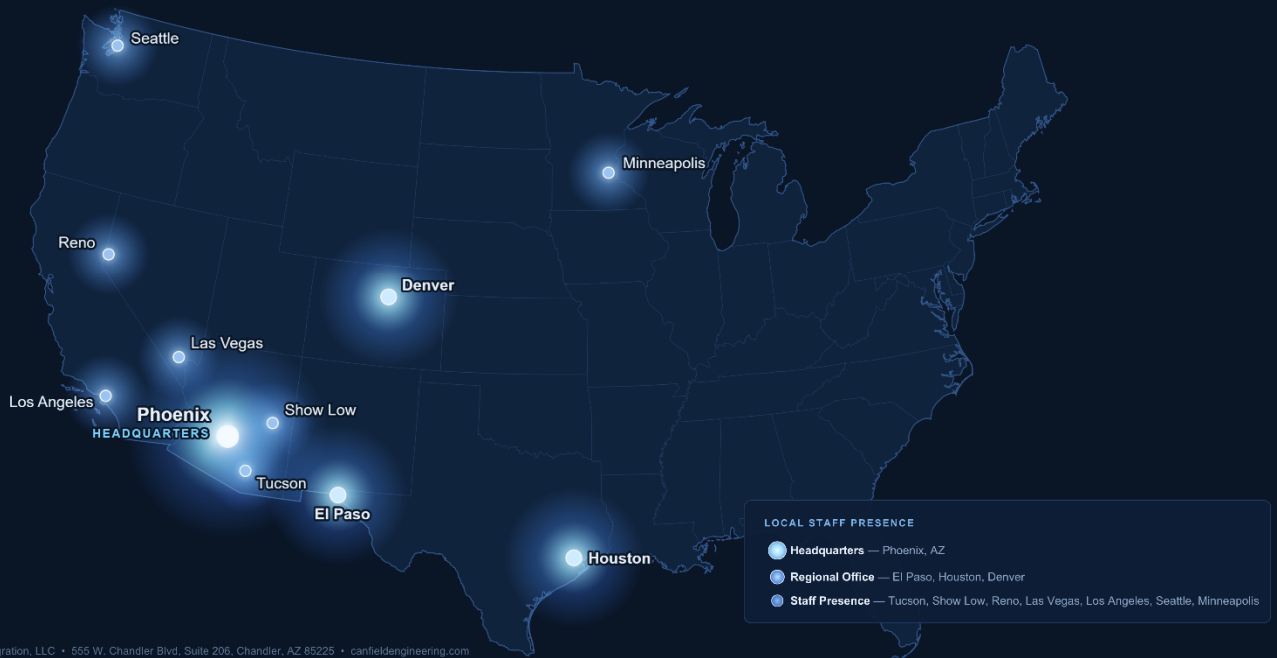
YEARS COMBINED DESIGN &
PROGRAMMING EXPERIENCE

1,000+

PROJECTS COMPLETED

Regional Staff Presence

Current Local Staff Presence Across the United States



Canfield Engineering & Integration, LLC • 555 W. Chandler Blvd, Suite 206, Chandler, AZ 85225 • canfieldengineering.com

WORKING WITH CEI

- Design, programming, and commissioning are handled by one firm, which keeps the design intent, the SCADA configuration, and the as-built system aligned and reduces reliance on multiple vendors.
- CEI programs to the utility's existing PLC/RTU and SCADA standards when libraries and documentation are provided, and develops standards for utilities that do not yet have them.
- Experience with SCADA migrations and platform transitions, including Allen-Bradley/Rockwell, Modicon, Siemens, Ignition, FactoryTalk View, iFix, and Wonderware/AVEVA.
- HMI/OIT/SCADA network and cybersecurity scope addressed in the context of EPA and AWIA requirements for water systems.
- CEI designs control panels and witnesses FAT/SAT; fabrication is performed by established UL 508A panel shops. CEI maintains relationships with multiple shops and can obtain competitive pricing given adequate lead time.
- On-call and ongoing operations support after startup, including programming changes, troubleshooting, and instrument calibration.

Markets Served

Municipal water and wastewater systems • Water reclamation and treatment facilities • Lift stations, booster stations, reservoirs and wells • Distribution and collection telemetry • Tribal and federal water systems • Remote and telemetry-driven sites

EVALUATE | Assessments & Electrical Studies

Evaluations that support capital planning and regulatory compliance: verifying existing conditions, determining whether equipment can be reused or must be replaced, and producing the studies required for permitting, energization, and code compliance.

Assessments

- Feasibility studies
- Equipment condition assessments
- Facility and site assessments
- Master planning
- Asset lifecycle planning
- Safety and compliance audits

Electrical Studies

- Short circuit analysis
- Protective device coordination
- Load flow analysis
- Arc flash studies and labeling
- Motor starting analysis
- Harmonics and power quality
- Radio path and telemetry studies

ENGINEER | EI&C Design

Complete electrical and controls design packages for utility facilities: drawings, specifications, and calculations, coordinated across disciplines and sealed by CEI P.E.s.

Electrical Design

- Power distribution from 12V controls to 500kV
- Facility and site electrical design
- Duct bank design
- Utility coordination and interconnect agreements
- Standby generation and transfer schemes
- 3D/BIM modeling
- Grounding, lighting, and raceway plans
- Lightning Protection

Instrumentation & Controls Design

- P&IDs
- Control schematics and panel design
- Control narratives / sequences of operation
- Network and loop diagrams
- SCADA and telemetry network design
- Instrument selection and specification
- I/O lists and instrumentation schedules

Special Systems

- Fire alarm and life safety
- Access control and security
- Telecommunications

Standards & Specifications

- Division 25, 26, and 40 specification development
- Owner standards and design guide development
- Equipment and integrator pre-qualification support

INTEGRATE | Programming, SCADA & Panel Design

System integration is performed in-house on the major industrial platforms. CEI programs to the utility's standards where they exist and maintains the SCADA configuration in alignment with the design, which supports long-term consistency across the utility's facilities.

Process Programming

- PLC programming — Allen-Bradley ControlLogix / CompactLogix, Modicon, Siemens
- HMI/OIT development — FactoryTalk View, Ignition, iFix, Wonderware/AVEVA
- Telemetry and radio configuration
- OPC and driver configuration
- Factory & Site Acceptance Testing (FAT)/ (SAT)

Control Panel Design & Fabrication Oversight

- UL 508A control panel design
- Fabrication by established UL 508A panel shop partners (CEI does not fabricate in-house)
- Multiple shop relationships; competitive fabrication pricing available with adequate lead time
- Fabrication shop coordination and document review
- Shop inspections and witnessed FAT
- Vendor panel submittal review

SCADA System Integration

- SCADA architecture and migration
- Data and tag database setup
- Historian setup and reporting
- Alarm management
- OIT network and cybersecurity coordination (EPA/AWIA context)

Commissioning & Startup

- Commissioning plans and checklists
- Field instrument calibration and functional testing
- Site Acceptance Testing (SAT)
- Startup support and operator training
- Ongoing operations support and on-call services

CONSTRUCT & SUPPORT | Construction, Procurement & Operations Support

Construction-phase engineering support and post-startup services: submittal, RFI and O&M manual review, field observation, record drawings, and ongoing on-call support.

Construction & Procurement

- Bid support and addenda
- Technical bid review and long-lead equipment packages
- Submittal and shop drawing review
- RFI responses
- Field observation
- O&M manual review
- Record drawings

Operations & On-Call Support

- On-call EI&C and SCADA support agreements
- Programming changes and troubleshooting
- Field instrument calibration and functional testing
- PLC/RTU/SCADA and historian support
- Standards and documentation maintenance

ONE FIRM ACROSS THE FACILITY LIFECYCLE

Utility EI&C work is often divided among a design consultant, a separate integrator, and a panel shop, and the utility coordinates between them and is required to re-explain its systems to each. CEI consolidates design, programming, panel design and fabrication oversight, commissioning, and on-call support in one firm. For the utility, this means:

Continuity of knowledge. The firm that designs the facility writes the control logic and commissions the system, and retains that knowledge for future modifications and support rather than relearning the site each time.

Programming to the utility's standards. Where the utility maintains PLC/AOI libraries and SCADA standards, CEI programs to them. Where it does not, CEI can develop standards so future work stays consistent across facilities.

Reduced vendor dependence. Native-format PLC programs, HMI applications, and telemetry configurations are delivered to the utility, which keeps the utility in control of its own systems.

Regulatory context. Electrical studies, OT network design, and SCADA cybersecurity scope are addressed in the context of the utility's EPA and AWIA obligations.

Support after startup. CEI provides on-call programming, troubleshooting, and instrument support, so the utility has a single point of contact familiar with its facilities over time.

The practical effect is fewer interfaces for the utility to manage and a consistent EI&C approach across its facilities.

CONTACTS

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