

FORCON INTERNATIONAL

KEITH A. MURRAY, PE

SUMMARY

Mr. Murray is a civil/structural engineer with over 34 years of experience in the design and construction of industrial, institutional, commercial and residential structures. Included in this experience were 12 years spent as a field engineer on major power plant construction projects. Over the course of years as a design engineer, he has gained experience with a variety of construction materials, foundation types and structural systems. Construction materials include reinforced concrete, structural steel, reinforced concrete masonry and wood. Foundation types include shallow spread and strip footings, driven steel piles, auger-cast piles and drilled piers. Structural systems include braced frames, rigid frames, composite and non-composite steel and concrete floor structures, shear diaphragms, shear walls and combinations thereof.

In addition to the structural analysis and design of new structures, Mr. Murray has performed investigations of structural deficiencies in existing and new structures to determine the cause and provide a recommendation or design for repair. These investigations have been performed on behalf of Owner's, Architects and Contractors. The combination of design, construction and inspection experience allows Mr. Murray to efficiently determine the cause, or most probable cause, of a structural deficiency or failure and quickly recognize an unsafe condition.

EDUCATION

Bachelor of Science in Civil Engineering with major in Structural Engineering – Purdue University; 1990

REGISTRATIONS

Registered Professional Engineer in the following States:

- | | | |
|------------------|-------------|------------------|
| ○ Alabama | ○ Georgia | ○ Indiana |
| ○ Kentucky | ○ Louisiana | ○ Maryland |
| ○ North Carolina | ○ Oklahoma | ○ South Carolina |
| ○ Tennessee | ○ Texas | ○ Virginia |

PROFESSIONAL ASSOCIATIONS/AFFILIATIONS

American Institute of Steel Construction (AISC)

Current record with National Council of Examiners for Engineers and Surveyors (NCEES)

CAREER HISTORY

FORCON International – Structural Engineer

Providing forensic engineering and expert witness services regarding structural and roofing damage, moisture intrusion, and construction defects.

Arthur Engineering – Structural Engineering Supervisor

Responsible for structural engineering design, coordination of structural design with other disciplines, calculations, production of project deliverables, shop drawing review and interfacing with Clients and Contractor's from project conceptual phase through completion of construction on industrial projects.

Bechtel – Lead Civil/Structural Field Engineer

See Highlighted Projects.

Duke Energy – Lead Engineer

See Highlighted Projects.

Project Associates, Inc. – Senior Project Engineer

Senior project engineer for a multi-discipline engineering firm engaged primarily in outage and maintenance support, retrofits, modifications and other miscellaneous industrial projects for clients such as Duke Energy, Alcoa Aluminum, Hershey, Dana Corporation, Toyota North America, and Bristol Myers/Squibb. Responsibilities included structural analysis and design of steel, concrete and masonry structures, and structural analysis of existing structures as required for retrofits and modifications. Duties also included supervision of designers and drafters, preparation of design calculations, drawings, and specifications, drafting, review and approval of Contractor submittals, coordination with Client, field work, and construction inspections for conformance to design requirements.

RT Patterson Co., Inc. – Project Engineer

Project engineer for multi-discipline engineering firm engaged primarily in modification, retrofit and other miscellaneous industrial projects for mid-west aluminum plants including Alcoa Warrick, IN, Century Aluminum, KY, and Akan Aluminum, KY. Responsibilities included structural analysis and design of miscellaneous steel, concrete and masonry structures, and structural analysis of existing structures as required for retrofits and modifications. Duties also included supervision of drafters, preparation of design calculations, drawings, drafting, coordination with Client, field work, and construction inspections for conformance to design requirements.

Hodge Design Associates, Inc - Project Engineer

Project engineer for a structural consulting firm engaged primarily in the design of structural systems for institutional, commercial, and light industrial buildings for architectural firms. Responsibilities included structural analysis and design of a diverse array of structural systems including conventional steel, concrete, masonry, composite steel and concrete floor systems, bar joist and composite metal form deck floor and roof systems, and glued-laminated timber. Duties also included supervision of drafters, preparation of design calculations, drawings, specifications, drafting, coordination of design with Architect and other engineering disciplines, review and approval of Contractor submittals, construction inspections and special inspections for conformance to design and Building Code requirements. Projects included multiple institutional and commercial buildings in Indiana, Illinois and Kentucky.

Raytheon Co., Inc - Project Engineer

Project engineer for a large multi-discipline engineering firm engaged primarily in the design of heavy civil structures for hydro-electric power projects. Responsibilities included structural analysis and design of concrete structures, steel structures and temporary structures required for construction. Duties also included preparation of design calculations, coordination of structural design with other engineering disciplines, supervision of designers and drafters, and review and approval of final design drawings.

HIGHLIGHTED PROJECTS BY COMPANY

Duke Energy

- **Citrus County Combined Cycle Project, Crystal River, FL (2016-2017)**
 - Owner's field engineer and oversight representative for civil/structural activities on 1.5B turn-key construction of a new natural gas fired combined cycle power plant.
- **Hines Chiller Project, Bartow, FL (2015-2016)**
 - Owner's field engineer and oversight representative for civil/structural activities on 1.5M turn-key addition of chiller system to an existing natural gas fired combined cycle power plant.
- **Cayuga SCR Project, Cayuga, IN (2012-2015)**
 - Owner's field engineer and oversight representative for civil/structural activities on a 500M addition of environmental controls to an existing (2) unit coal fired power plant. Environmental control systems included Selective Catalyst Reduction, Dry Sorbents Injection, Dry Fly Ash, Arsenic Mitigation, and Economizer Gas Temperature Control.

FORCON INTERNATIONAL

- **Edwardsport Integrated Gas Combined Cycle (IGCC) Project, Edwardsport, IN (2008-2012)**
 - Owner's field engineer and construction coordinator for civil/structural activities on construction a new 4.2B coal-to-gas fired combined cycle power plant.

Bechtel

- **Plant Vogtle Units 3 & 4, Waynesboro, GA (2017-2021)**
 - General Contractor's lead civil/structural field engineer for the construction of the new Unit 3 Turbine Building.