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Garret Byrne | Forensic Engineer, **PE**

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Professional Summary:

Mr. Byrne is a Senior Structural Engineer with more than 25 years of structural engineering experience in all facets of both new construction and renovations to existing facilities including the design of steel, concrete, masonry, and timber structures. He is knowledgeable of the latest IBC, ACI, and AISC code requirements pertaining to the design of structures including the latest wind and seismic provisions per ASCE 7 and AISC 341. As a project manager, Mr. Byrne prepares proposals and construction cost estimates, conducts meetings, designs and analyzes structures, develops details, writes technical reports, coordinates with subconsultants, ensures quality control, reviews contractor submittals and shop drawings, and performs construction observation.

- Structural Steel
- Connections – Bolted and Welded
- Cast-in-place Concrete, Post-tensioned Concrete
- Foundations, including deep foundations
- Wood and Timber design

Licenses and Certifications:

Professional Engineer, Maryland, No. 24847

Professional Engineer, Connecticut, No. 26153

Professional Engineer, Pennsylvania, No. 082202

Professional Engineer, West Virginia, No. 21681

Project Experience:

Crane Girder Modifications, Arcelor Mittal-Steelton, Dauphin County, PA. Participated in the design and implementation of emergency fixes to a 98-foot-span crane girder in the steelmaking building that supports a pair of 250-ton-capacity cranes and a pair of 110-ton-capacity cranes. Overloading caused localized buckling at the girder web. Implemented repairs including installation of two auxiliary columns with diagonal braces at the third points of the 98-foot span, new foundations below an existing framed floor, and plating the girder web in the area of concern. Timely completion of these fixes allowed the mill to operate with minimal downtime.

Chemical Injection Building, Arcelor Mittal-Steelton, Dauphin County, PA. Performed reviews of the structural design of this steel-framed 300-SF addition to an existing building supported on shallow spread footings.

Steelmaking Duct Capacity, Arcelor Mittal-Steelton, PA. Designed enhancements that allowed for safe removal of material buildup within this 28-foot-diameter steel duct with intermediate stiffeners and spanning more than 60 feet. Also developed criteria for regular maintenance of the duct to avoid overloading and subsequent overstress of the structural duct and its steel supports.

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Crane No. 18 Bumper Replacement Design, Arcelor Mittal-Steelton, Dauphin County, PA. Performed QA/QC check of the structural analysis of the steel stops required at the end of the crane runway.

20-Inch Mill Upgrades, Arcelor Mittal-Steelton, Dauphin County, PA. Work required to allow for the installation of two new monorail beams with 3-ton-capacity hoists for the full length (195 feet) of the building. Required analysis and design of the existing roof trusses for additional loads and design of localized reinforcing for structural elements where structural capacity was inadequate.

Conversion of Mill Building to Storage, Arcelor Mittal-Steelton, Dauphin County, PA. Performed analysis of existing framing to determine the safe allowable storage load at the main floor and mezzanine of this building. Project involved qualifying existing structural elements through rational analysis to determine the structural capacity of the various elements and identifying the controlling factors that limit the storage capacity.

Walkway over Settling Basin, Arcelor Mittal-Steelton, Dauphin County, PA. Designed a walkway and maintenance platform to replace an existing deteriorated walkway and platform. Project involved the design of steel framing to support grating and accommodate safety cables for the tie-off of maintenance personnel in order to establish safe working conditions.

Lube Oil Platform Modifications, Arcelor Mittal-Steelton, Dauphin County, PA. Designed steel framing to enclose the platform and control temperatures to improve performance of equipment and support monorail hoists required for the maintenance of equipment.

Gas Line Relocation, Arcelor Mittal-Steelton, Dauphin County, PA. Project involved the design of a steel-framed utility bridge and associated shallow foundations. Bridge is 210 feet long with spans ranging from 40 feet to 75 feet with bents and towers with vertical bracing and long-span beams and trusses with horizontal bracing.

Repair of Structural Steel Members at Furnace No. 207, Arcelor Mittal-Steelton, Dauphin County, PA. Analyzed heat-damaged box girder member that is part of a tilt table and rocker assembly used to cradle and tip the furnace shell during steelmaking operations. During abnormal operations, molten steel and slag material can spill and tends to flow onto the supporting steel members with unpredictable effect on the member's capacity. The design of the repair to this member included analysis to verify that the original capacity of this box girder was restored, development of details to install sections of plate to replace portions of damaged web plate and air-arc gouge cracks within the flange plate, and repair weld specifications.

20-Inch Mill Furnace Foundation Condition Issues and Repairs, Arcelor Mittal-Steelton, Dauphin County, PA. Performed analysis of existing deteriorated furnace foundation walls and beams to determine most cost-effective method of reestablishing full support for the functioning furnace above. Entailed developing an alternate load path to bypass badly damaged and corroded reinforced-concrete members and provide full support down to an existing mat foundation. Required the design of auxiliary steel posts that provide support capacity equal to or greater than the original design members.

Plant Standard Handrails, Arcelor Mittal-Steelton, Dauphin County, PA. Performed code analysis to determine minimum requirements regarding configuration as well as structural analysis to determine element sizes required to provide adequate structural capacity for code-prescribed loads.

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Relocation of Jib Crane, Arcelor Mittal-Steelton, Dauphin County, PA. Performed structural analysis and design required to provide a new foundation and adequate anchorage for a jib crane with a 2-ton hoist.

Long Length Rail Office Repairs and Replacement of Locker Room Building, Arcelor Mittal-Steelton, Dauphin County, PA. Assessed existing conditions following a gas explosion and determined extent of damage, developed appropriate repairs to remaining portions of the building, and designed a replacement structure in place of the building that was destroyed. Repairs consisted of shoring existing roof structure while load-bearing masonry walls were partially dismantled and rebuilt to restore original structurally sound configuration. The design of new construction included masonry wall design and selection of appropriate open-web joist members at the roof level spanning 36 feet.

Bulk Unloading Facility and Stormwater Survey, Arcelor Mittal-Steelton, Lancaster County, PA. Performed structural analysis and design for the addition of bulk liquid truck unloading facility. Designed a 60-foot-long by 12-foot-wide truck pad that drains to a separate spill containment tank adjacent to the pad. Project required modifications to the existing storage tank building to accommodate the pump station and ensure that the interior area is also able to contain and direct spills to the spill containment tank. Also designed OSHA-compliant platforming at the top of the existing steel wall tanks to facilitate maintenance and improve safety.

High Concrete Plant Improvements, High Concrete Group, LLC, Lancaster County, PA. Performed structural analysis and design for the addition of a sandblasting and acid washing facility. Entailed designing a 300-foot-long double aisle intended for the sandblasting of precast-concrete panels. Wall design required consideration of a traveling dust hood and collection system that is supported on rails. Acid wash aisle is 240 feet long and required provisions for the drainage of caustic liquids via a cast-in-place concrete trench.

Main Electrical Shop Temporary Roof Repairs, Arcelor Mittal-Steelton, Dauphin County, PA. Served as Structural Engineer for repairs to the power gang roof, which is supported by heavy-timber trusses that were in extremely poor condition. Several trusses exhibited conditions that indicated a danger of collapsing under a significant load, such as a heavy snow event. To reinforce the roof, converted to a traditional post and beam condition at one end of the trusses, while still relying on partial truss action at the opposite end.

Freshwater Intake Ozone Treatment Facility, Antero Resources, Tyler County, WV. Served as Structural Engineer for performing structural analysis and design for the addition of a second platform at this surface water withdrawal facility. The new platform is 75 feet by 45 feet and supports water treatment equipment. The pile-supported mat foundation supports a series of 14-foot-diameter by 17-foot-high storage tanks that generate ozone-treated water. This ACI 350-designed foundation also serves as secondary containment.

Mayo Power Plant Bottom Ash Conversion, Progress Energy, Person County, NC. Responsible for the structural aspects of an environmental upgrade to this coal-fired power plant. Activities included development of technical specifications, structural framing concepts, foundation layouts, manpower estimates, management of the project schedule, oversight of structural engineering and design staff, and coordination with other disciplines and vendors.

Kleen Energy Power Plant, O&G Industries and Kleen Energy Systems, Middlesex County, CT. Served as Structural Engineer of Record responsible for all structural aspects of this 620-mw combined cycle power plant. Activities included development of technical specifications, structural framing concepts, foundation layouts, manpower estimates, management of the project schedule, oversight of structural engineering and design staff, and coordination with other disciplines

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and vendors. TIC: $800 million; Size: 620-mw combined cycle power plant. Professional Services Completed: 2009; Construction completed in 2010.

Salem Nuclear Power Generating Plant, PSEG Nuclear, Salem County, NJ. Served as Structural Engineer for the design of this structural steel transition structure that conveys a 48-inch-diameter detritus discharge pipe essential to the continuing operation of the plant cooling water system from grade to the bed of the Delaware River. This offshore structure is constructed of welded round hollow structural sections supported on piles. Construction required the consideration of severe environmental loading conditions including wind, wind generated wave loads, river current, and ice floes.

El Centro Unit 3 Repowering, ARB, Inc., Imperial County, CA. Served as Structural Engineer for the design of this structural steel utility bridge framing to convey piping and electrical systems from the heat recovery steam generator to the generation building and support equipment in a high-seismic region using the AISC seismic provisions. Required coordination with existing structural systems.

T-Power - Combined Cycle Gas Turbine Power Plant, Siemens Energy, Tessenderlo, Belgium. Served as Civil and Structural Site Liaison responsible for coordination between design office and contractor. Resolved field issues and facilitated communication among design team, client, and subcontractors across several disciplines.

CCC Norte Power Plant, Union Fenosa, Durango, Mexico. Served as Structural Engineer for the design of structural steel framing at multiple locations for the support of four auxiliary piping systems at this new combined cycle power plant. Required travel to the site to interact with field personnel to establish the scope of work.

Muskingum River Power Plant, American Electric Power, Washington County, OH. Served as Lead Engineer for the foundation design including supervision of structural engineering and design staff. Project scope included foundations for various structural elements associated with the addition of a flue-gas desulfurization system including ductwork supports, process buildings, and tanks. Used STAAD Pro for structural analysis and design for building mat foundation.

Mitchell Power Plant, American Electric Power, Marshall County, WV. Engineering included finite element analysis and design of micropile-supported pile cap foundations, high-sulfur coal blending reclaim tunnel and foundations for associated conveyor system, and evaluation and modification of existing mat foundation for selective catalytic reduction additions using STAAD Pro. Collaborated with fellow engineers in the development of modeling criteria and assumptions. Evaluated instances of nonconforming items with respect to structural capacity.

American Pharmacists Association, Headquarters Renovation and Expansion, Washington County, DC. Served as Structural Engineer for the development of structural schemes for the renovation and expansion of the association headquarters. The project included design development of a concrete frame building with post-tensioned floor slabs, shear walls, and pressure slab foundation system. Preliminary design included coordination with architects and other engineering disciplines and included security considerations such as blast design and progressive collapse mitigation.

Art and Music Facility, Washington and Lee University, Rockbridge County, VA. Served as Project Manager and Lead Structural Engineer for this multiuse facility housing faculty offices, classrooms, practice rooms, art galleries, and an auditorium. Assigned tasks and supervised activities of engineers for the structural design of this four-story, concrete frame building with two-way slabs and shear walls. Structural design of the auditorium required consultation with an acoustic consultant resulting in underground mechanical trenches with sound attenuation, a castellated-beam

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roof framing system supporting sound mass concrete over a long-span, deep rib steel deck, hung sound baffles, elevated sound booth, and hanging catwalks.

Torre Del Angel Office Building Seismic Assessment, General Cologne Re, Mexico City, Mexico. Performed a comprehensive site survey and structural analysis of this 20-story building located in one of the world's most seismically active regions for compliance with the Mexico City Building Code.

Station Place, Louis Dreyfus Property Group, Washington County, DC. Served as Senior Structural Engineer responsible for the design of complex elements of this concrete frame building including the design of a loading dock adjacent to Union Station and Amtrak rail lines and elevated access ramp for AASHTO truck loading, and a steel frame long-span pedestrian bridge. Also included phasing of overall construction, collaboration with bridge consultants, collaboration with security consultants, incorporation of vehicle barriers, and accommodation of owner-requested changes resulting in redesign during construction. Size: 2.2 million SF; TIC: $750 million; Professional Services Completed: 2004; Construction Completed: 2005

National Archives Building Renovation, National Archives and Records Administration, Washington County, DC. Lead the structural engineering effort for the $150 million renovation to the permanent home of the Declaration of Independence, the Constitution, and the Bill of Rights, collectively known as the Charters of Freedom. Work included creation of additional office space within a dry moat, expansion of existing underground electrical vaults, and removal of an entire floor plate to accommodate two new intermediate levels more conducive to public use. Project Construction Cost: $150 million; Professional Services Completed: 2002; Construction completed in 2003.

Seismic Compliance with Executive Order No. 12941, National, General Services Administration, Nationwide. Responsible for a comprehensive survey effort of all GSA-owned or leased buildings and National Institute of Standards and Technology Administration buildings in the United States. Conducted in-depth analysis for compliance with FEMA requirements for buildings such as the White House, the Old Executive Office Building, the State Department Building, National Institute of Standards and Technology Administration, and Metrology Buildings. Size: Varied per building; Professional Services Completed: 1999

The Pentagon Renovation, U.S. Department of Defense, Arlington County, VA. Performed structural design for this large-scale renovation. Work included lowering the basement slab elevation by excavating between existing pile caps, augmenting the pile groups, creating a new basement level with a mezzanine, and transforming a one-story condition into a two-story condition. Also developed load-testing criteria, performed condition assessments, and designed repairs to deteriorated structural steel and concrete. Professional Services Completed: 1997; Construction Completed 2001

National Association of Securities Dealers Headquarters (NASDAQ), Rockville, Montgomery County, MD. Served as Structural Engineer for the design of this post-tensioned, multi-story concrete-framed office building housing the operations for the NASD.

Mascara Tank Project, Proctor & Gamble, Baltimore County, MD. Served as Structural Engineer for the replacement of an outdated and undersized cosmetics production tank with a new higher-volume tank. The project involved structural revisions and repairs to an existing steel frame mezzanine with concrete deck. Analyzed existing connections for structural adequacy and designed supplemental steel framing required to support the increased load.

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Professional Experience:

Rettew Associates, Lancaster, PA 2013-2016
WorleyParsons Group, Reading, PA 2004-2013
Thornton Tomasetti, Washington, DC, 2001-2004
URS Corporation, Washington, DC, Senior Structural Engineer, 1996-1997 & 1999-2001
Cagley & Associates, Rockville, Maryland, Structural Engineer 1997-1999
Wallace Engineering, Tulsa, Oklahoma, 1994-1996

Education:

M.S., Architectural Engineering, The Pennsylvania State University, University Park, Pennsylvania, 1994

B.S., Building Science, 1990, Rensselaer Polytechnic Institute, Troy, New York, 1990

Affiliations:

American Institute of Steel Construction (AISC), Member
Research Council on Structural Connections (RCSC), Member - Committee A2/A4 - Research Spending

Courses Instructed/ Guest Lecturer:

2002 – 2004, Adjunct Professor, The Catholic University of America, Washington, D.C.
Developed course material and instructed architecture students in structural analysis and design. Course fulfilled upper level course requirements with the goal of preparing students for professional licensure.

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