

# David Liu, PhD PE SE

## Senior Structural Engineer



Mr. Liu is a Sr. Structural Engineer at GMA Engineering. He has served in Engineer of Record, Owner's Representative, Project Management, Independent Reviewer, Quality Control, and other technical leader roles.

Mr. Liu has over 25 years of experience in structural design and analysis of steel I-girder, steel box girder, steel truss, prestressed concrete girder and post-tensioned bridges, retaining wall, noise wall, and railroad bridges.

David's strength lies in his depth of technical experience to quickly comprehend and provide sound engineering solutions.

### Qualifications

BS and MS, Structural Engineering,  
South China University of Technology

PhD, Structural Engineering  
Clarkson University

### Licenses

PE in IL, IA, MI, WI, PA, NM and FL

SE in IL

### Professional Associations

American Society of Civil Engineers, Fellow

### Publications

Authored 30 technical publications

### Van Wyck Expressway Contract 2, Design-Build, New York, NY

\$350+ million design build project to widen Van Wyck Expressway in Queens. Mr. Liu was the Quality Control for the replacement of reinforced concrete retaining walls and the design of new steel walkways on LIRR bridges. Project also includes rapid replacement of one LIRR bridge, one vehicular bridge, and retrofit and reconstruction of existing LIRR double decker bridge

### I-95/I-10 Operational Improvements Design-Build, FDOT\*

\$117 million Design-Build project. Mr. Liu created the design calcs for pier 45 supporting two new beams and existing beams (bulb-tee beams), Hammerhead with post tensioning, review post-tensioned cap design check with Adapt program, and performed independent design check on two integral straddle bents with post-tensioning.

### Elgin O'Hare Western Access tollway (IL 390) Roadway and bridge construction IL route 83 to York road milepost 25.9 to Milepost 27.0\*

Mr. Liu reviewed E03 bridge final design and final bridge plans of Single span, 183 ft long steel plate bridge with skew of 42 degrees. Complex framing due to variable deck width.

### Circle Interchange Reconfiguration, Cook County, IDOT\*

Engineer of Record for Illinois's first precast deck panel bridge with UHPC (Ultra-High Performance Concrete) joints (Peoria Street bridge over I-290 and CTA), reviewed girder design and final bridge plans. Reviewed preliminary design of SE Ramp bridge (8-span, curved steel plate girder with a **radius of 210 ft**). Engineer of Record for Wall 40 that is 247-ft long, 25-ft tall MSE wall with moment slab at top. Aggregate Column Ground Improvement and Lightweight Cellular Concrete Fill are used to reduce settlement. Reviewed final design of Van Buren Street bridge (4-span, 75'-86'-171'-154', steel plate girder). Reviewed final design of Wall 39 (6 ft diameter, 22ft tall drilled shaft soldier pile wall)

### Reconstruction and Widening of I-90, ISTHA (IL Tollway)\*

Design corridor manager, responsible for reviewing final design of 54" shallow depth ppc beams of 2-span (117'-143') bridge (IL 72 over I-90) with integral abutments with MSE wall wrap around. Due to curved alignment and 37 degree skew, framing is complex for straight concrete

beams that are kinked at pier. Staged construction made the bridge design be even more challenged.

**O'Hare Joint Use Rental Car and Parking facility and ATS Extension, Chicago Department of Aviation\***

Lead structural engineer for final design of ATS guideway bridge connecting Parking Lot E to Parking Lot F. 29-span, rolled beam/steel plate girder bridge.

**Rollins at IL 83, Lake County\***

Structural Review of final plans of Wisconsin Central RR over Rollins Road (thru plate girder RR bridge), Retaining walls: CIP wall on H-pile, CIP wall on spread footing, sheet pile wall with tied back system.

**Ohio Street Bridge Replacement, Aurora, IL\***

Lead structural engineer for the reconstruction of the Ohio Street Bridge over Indian Creek and the BNSF Railroad in Aurora.. Ohio Street Bridge crosses four tracks of the Burlington Northern Railroad which accommodate freight and commuter trains. Performed steel plate girder design (3-span, 82'-142'-117', 30" deep web).

**Rehabilitation of I-39 Bridges over Kishwaukee River, Winnebago County, Illinois\***

Performed transverse analysis of twin 5-span, post-tensioned segmental box girder bridges erected by balanced cantilever method. Checked deviator design. Plan preparation for external PT retrofit.

**US 20 Mississippi River Bridge, Dubuque County, Iowa\***

Performed final design of 4 steel plate girder bridges, including 645' long haunched plate girder bridge.

**Paseo Bridge over Missouri River, Missouri\***

Checked bridge rating analysis of US first self anchored suspension bridge.

**LRT over Lake St., and LRT over 28<sup>th</sup> St., Hiawatha Light Rail Transit, Minnesota DOT\***

Performed independent design on substructure of 2 post-tensioned concrete box girder LRT bridges.

**I-74 over Rock River, Rock Island County, Illinois\***

Performed pier design of 7-span, steel plate girder bridge

**University of Utah, 2002 Winter Olympic Games Project\***

Checked final design of cable-stayed pedestrian bridge.

**CN (Canadian National) Champaign Locomotive Platform project, Champaign, Illinois\***

EOR: direct fixation on slab on grade

**Morgan Street Bridge Replacement, City of Rockford, Illinois**

Performed TSL design of floor beam and PT deck (300' steel tied arch bridge, laterally unbraced ribs, long. PT on deck)

\*Prior to joining GMA Engineering