

USE OF 3D MODELLING IN IOWA DOT ACCELERATED BRIDGE CONSTRUCTION (ABC) PROJECTS

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ABC Definition

- ABC is bridge construction that uses innovative planning, design, materials and construction methods in a safe and cost-effective manner to reduce the on site construction time that occurs when building new bridges or replacing and rehabilitating existing bridges.

- FHWA Accelerated Bridge Construction Final Manual

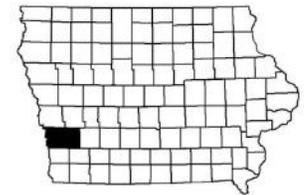
ABC Techniques

- Prefabricated Bridge Elements and Systems (PBES)
 - Precast elements
 - Modular units
 - Slide-In Bridge Construction (SIBC)
- Innovative Contracting
 - A+B Bidding
 - I/D Contracts
- Accelerated Project Delivery
 - Design-Build
 - CMGC

Iowa's ABC Experience

- 11 Demonstration projects constructed to date
 - Focus on a variety of PBES
 - Focus on I/D contracting
 - Grants – IBRC, IBRD, SHRP2 R04, HfL
- 1 Project under construction summer 2015
- 1 Project currently in Final Design
- 2 Projects currently in Preliminary Design

Keg Creek Bridge



Keg Creek Bridge

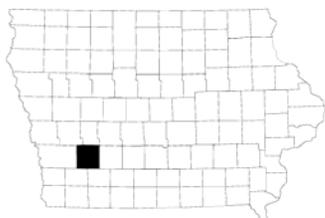
Name	Keg Creek
Location	US 6 over Keg Creek
Year Constructed	2011
Owner	Iowa DOT
Engineer	HNTB Corporation
Bridge Type	Rolled Steel I Girder
Size	204'-6 x 44'-0
Spans	67'-3, 70'-0, 67'-3
ABC Technologies	Precast Abutment Footing
	Precast Wingwalls
	Precast Pier Caps
	Precast Pier Columns
	Modular Units
	UHPC Joints
	Grouted Splice Couplers
Total Project Bid	\$2,658,823.35
Bridge Unit Cost*	\$161/SF
ABC Contract Period	14 day critical closure w/ \$22,000/day I/D
Grant	SHRP2 R04
*Traditional unit cost at this time for I Girder = \$90/SF	

Keg Creek 3D Model

- Google SketchUp 8.0
- Kerkythea Echo 2008
- Windows Movie Maker 5.2

- HNTB

Massena Bridge



Massena Bridge

Name	Massena Lateral Slide
Location	IA 92 over Small Stream
Year Constructed	2013
Owner	Iowa DOT
Engineer	Iowa DOT
Bridge Type	PPCB
Size	120'-0 x 44'-0
Span	120'
Key ABC Technologies	Slide-In Bridge Construction (SIBC)
	Precast Wingwalls
	Precast Abutment Footing
Total Project Bid	\$1,346,647.90
Bridge Unit Cost*	\$112/SF
ABC Contract Period	9 day critical closure w/ \$10,000/day I/D
Grant	HfL
*Traditional unit cost at this time for PPCB = \$85/SF	

Massena 3D Visualization

- Google SketchUp 8.0 (Now Trimble SketchUp)
- SU Animate V4 plug-in from Cadalog
- SketchyPhysics 3.1 plug-in
- Kerkythea Echo 2008
- Bentley MicroStation V8i
- Windows Live Movie Maker 2011
- Satellite Imagery Google Inc.
- CamStudio
- Trimble 3D Warehouse
- Site photos from Multivista

3D Model Benefits

- Clash Detection
- Constructability Review
- Pre-Bid Meeting
- Public Information Meetings