New Challenges for Army Combat Engineers:

Bomb Damage Assessment, Fire Damage Assessment, Evaluation of Diminished Capacity, and Developing New Strategies for Short, Medium and Long-term Mitigation/Repair

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Tikrit Bridge Demolition by Iraqi Forces
Critical structures damaged by bombs and Improvised Explosive Devices must be evaluated for capacity. No clear cut methodologies or established protocol is presently included in combat engineering training syllabus to educate junior officers how to go about these tasks.
Bomb and fire-damaged bridge decks required immediate evaluation of diminished capacity. Then, decisions about what kinds of short, medium or long-term measures to effect repairs. At present, long-term repairs are generally turned over to civilian contractors.
Fire Damage Assessment
The traditional role of combat engineers has been short-term combat bridging – “only there long enough to win the battles”
This view shows the longest floating river bridge assembled in a combat theater since World War II, across the Tigris River in Tikrit. A typical pontoon treadway bridge can be erected in just 6 hours, but would require two multi-role bridge companies, 36 Bridge Erection Boats, 80 Assault Float Bridge sections and 24/7 operability of the boats.
Tikrit Highway Bridge Assessment & Temporary Repairs
East Bound Traffic
Mabey Johnson Bridge end connections
Pier 8, east end

Damaged Pier 7, west end
PIER 7 FRONT VIEW

*Mostly surface damage cracks - do not require daily measurement
PIER 7 TOP VIEW

Bridge Pier Cap w/ Cantilever ends

Bridge Beam & MJ Bearing area

East bound traffic

West bound traffic Using MJs

Bridge Pier

*Critical crack requires daily measurement
PIER 7 SIDE VIEW

*Crack will not grow without crack on top of the pier cap growing*
Do not require daily measurement
*Crack will not grow without crack on top of the pier cap growing
Do not require daily measurement
Tikrit Bridge
- AFB
- 2x M-J on Fixed Bridge

Tikrit Bridge Bypass

Roads to Kirkuk

Samarra

Tikrit Bridge LOCs
Bypass Route

Length 24 km
Tikrit By-Pass Construction
Decisive Point – Bridge to Shore Connection

- Unprepared Abutment
- Landing Bay
- Deflection angle = 6.5%
- Median water level
- Material added for elevation to median water level
- Rotating Junction
- Total Deflection = 4.2m

Near shore (West side)
Unloading and moving Individual Pontoons

Pontoons Specifications:
- 40,000lbs ea
- 2 sizes: 40 & 20 ft
- 7 ft deep
- 10 ft wide
Launching Individual Pontoons
Assembling Floating Pontoon Piers
Anchoring:
• River bottom investigated by Army divers
• Buried transoms used as Dead-man anchors for end spans
• Fluted anchors & pontoons filled with soil used for intermediate spans

Filling 40 ft pontoon with soil
Before scuttling

Fluted anchors doubled on line & Adjustable winches
Half-Complete Mabey Johnson Float Bridge
12 month pontoon bridge constructed by Bechtel across Tigris River

Segmented Mabey-Johnson trusses laid on rectangular steel pontoons. Each pontoon weighed 40 kips; lashed together in groups shown here. MLC 110 kip vehicle capacity, suitable for transit of M1A1 Abrams on transporters.
Completed Mabey Johnson Float Bridge
Old Bailey Bridge across Tigris Estuary (MLC 40)

Armored Vehicle Launched Bridge (AVLB) MLC 70

Lateral Sway supports