This manual provides guidance to administrative, engineering, and technical staff. Engineering practice requires that professionals use a combination of technical skills and judgment in decision making. Engineering judgment is necessary to allow decisions to account for unique site-specific conditions and considerations to provide high quality products, within budget, and to protect the public health, safety, and welfare. This manual provides the general operational guidelines; however, it is understood that adaptation, adjustments, and deviations are sometimes necessary. Innovation is a key foundational element to advance the state of engineering practice and develop more effective and efficient engineering solutions and materials. As such, it is essential that our engineering manuals provide a vehicle to promote, pilot, or implement technologies or practices that provide efficiencies and quality products, while maintaining the safety, health, and welfare of the public. It is expected when making significant or impactful deviations from the technical information from these guidance materials, that reasonable consultations with experts, technical committees, and/or policy setting bodies occur prior to actions within the timeframes allowed. It is also expected that these consultations will eliminate any potential conflicts of interest, perceived or otherwise. MDOT Leadership is committed to a culture of innovation to optimize engineering solutions.

The National Society of Professional Engineers Code of Ethics for Engineering is founded on six fundamental canons. Those canons are provided below.

Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health, and welfare of the public.
2. Perform Services only in areas of their competence.
3. Issue public statement only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, reasonably, ethically and lawfully so as to enhance the honor, reputation, and usefulness of the profession.
BRIDGE REPAIR COST ESTIMATE WORKSHEET

- KEY -

Unit Cost Assumptions
(Revised 01/29/09)

NEW BRIDGE
- Multiple spans, Concrete - add road approach, demolition, & traffic control.
- Multiple spans, Steel - add road approach, demolition, & traffic control.
- Single span (or multi span over water), Concrete - add road approach, demolition, & traffic control.
- Single span (or multi span over water), Steel - add road approach, demolition, & traffic control.
- Pedestrian Bridge - includes demolition & approach ramps, add traffic control.
- Other

NEW SUPERSTRUCTURE - includes removal of old superstructure, joints, new railing.
- Add road approach and traffic control.
- NOTE: Assume replace-in-kind unless specific recommendation from Design.
- Concrete
- Steel
- Over Water - additional cost to the steel or concrete superstructure replacement if over water.
- Other

WIDENING - Per square area of widened portion of deck.
- Includes cost of widening substructure units, must add additional cost of widening road approach.
- Other

NEW DECK - includes removal of old deck, joints, new railing. Add road approach & traffic control.
- Other

DEMOLITION
- Entire bridge, grade separation
- Entire bridge, over water
- Other

SUPERSTRUCTURE REPAIR
- Concrete Deck Patch - includes hand chipping.
- HMA Cap (no membrane) - add bridge railing if required.
- HMA Overlay with WP membrane - add bridge railing if required.
- Removal of Concrete Wearing Course (latex) or Epoxy Overlay - add this to overlay costs to remove existing latex or epoxy wearing course.
- Removal of HMA Overlay – add this to overlay costs to remove existing HMA overlay.
- Epoxy Overlay - does not include joint replacement.
- Shallow Overlay* - includes joint replacement & hydrodemolition; add bridge railing if req’d.
- Deep Overlay* - includes joint replacement & hydrodemolition; add bridge railing if req’d.
- *Add “Removal of Concrete Wearing Course” to remove existing latex ovly.
- PCI Beam End Repair - per beam end, $3,000 is “average”.
  - $2,000 for simple repairs (includes cathodic protection and concrete patching),
  - $4,000 for extensive repairs (includes new bearing assembly and temporary supports).
- Repair Structural Steel – per repair, includes temporary supports, add painting.
  - $2,400 bolted, $6,200 welded. Use $5,000 if unknown.
- High Load Hit Repair (PCI beam) – does not include temporary support, if needed.
- Paint Structural Steel - includes clean and coat.
- Partial Painting - includes clean and coat.
- Pin & Hanger replacement - includes temporary supports, does not include painting.
- Other
SUBSTRUCTURE REPAIR

Pier repair* - (measured x 2) - includes hand chipping, add temporary supports.
Pier repair over water* - (measured x 2) - includes hand chipping, add temporary supports.
Pier replacement - includes removal, piles, excavation, backfill, & cofferdam or sheet piling.
Abutment repair* - (measured x 2) - includes hand chipping, add temporary supports.
  *assumes depth of repair is 5"-6".
Temporary Supports for Substructure Repair
Slope Protection repairs - includes demolition / removal.
Other

MISCELLANEOUS

Expansion Joints and Construction Joints - includes joint removal.
  (combined per Design - construction joint usually replaced with exp. joint of some kind).
Bridge Railing, remove and replace – average.
  If Type 4, reduce by $30. If aesthetic parapet railing, increase by $40.
Thrie Beam Railing retrofit
Deck Drain Extensions – only two in WIRS. Cost may vary.
Scour Countermeasures
Other

ROAD WORK

Approach Pavement, 9½" RC, 40' ea. end - min. approach work to tie in to new bridge deck,
  includes removal of existing pavement.
Approach Curb & Gutter - includes C&G removal.
Guardrail Anchorage to Bridge (<40') - includes GR removal.
Guardrail, Type B or T - includes GR removal.
  for guardrail beyond GR Anchorage or to replace existing type B or T. Not more than $200’.
Guardrail Ending - needed unless new GR is tied into existing GR.
Roadway Approach work - when needed beyond 40', eg. transition to adjust crown or super,
  or add’l width needed when widening bridge or add’l length needed when raising grade.
Utilities
Other

TRAFFIC CONTROL - Unit costs to be determined by Region or TSC Traffic and Safety.
  Note: If bridge is within a road project, traffic control will in most cases be covered by the road project.
  If this is the case, please make note of it on the estimate form.

  Part Width Construction
Crossovers – very rough estimate.
Temporary Traffic Signals - price listed is bumped up from that provided by Lansing T&S in 2004.
RR Flagging
Detour
Other

CONTINGENCY - (10% - 20%) use higher contingency for small projects.

MOBILIZATION – Estimate at 5% but put “10% max.” in pay item description, per Design Update 2009-1.

INFLATION - use 5% per year, starting with year 2009, per Planning (5% 2009, 10% 2010, 15% 2011, etc.).