

BRIDGE REPAIR COST ESTIMATE WORKSHEET - KEY -

Unit Cost Assumptions (Revised 01/23/2023)

NEW BRIDGE – Includes removal and replacement of a structure. (*sft of proposed deck area*)

Increase deck area based on design standards and hydraulic requirements. Use the [Michigan Bridge Design Manual](#) (7.02.31) and [Michigan Design Guides](#) (6.05, 6.06) to determine appropriate geometrics. Use engineering judgement to determine hydraulic requirements and adjust the structure length accordingly.

Single or Multiple Spans, Grade Separation – add road approach, demolition, & traffic control.

Single Span, Over Water – add road approach, demolition, & traffic control. *Length < 100ft*

Multiple Spans, Over Water – add road approach, demolition, & traffic control. *Length > 100ft*

Precast Culvert – add road approach, demolition, & traffic control. *Length < 40ft*

NEW SUPERSTRUCTURE – Includes removal of existing deck and superstructure.

Assume replace-in-kind. Widen based on recommendation from Design.

New Superstructure, Grade Separation – add road approach, demolition, traffic control. (*sft*)

New Superstructure, Over Water – add road approach, demolition, traffic control. (*sft*)

WIDENING – Includes cost of widening substructure units, superstructure, and deck.

Structure Widening – add additional cost of widening road approach. (*additional sft of deck area*)

NEW DECK – Includes removal of existing deck and barrier.

Increase deck area based on design standards. Use the [Michigan Bridge Design Manual](#) (7.02.31) and [Michigan Design Guides](#) (6.05, 6.06) to determine appropriate geometrics.

New Bridge Deck & Barrier – add road approach, demolition, traffic control. (*sft of proposed deck area*)

DEMOLITION – Includes removal of existing structure, add backfill and road work if structure is not replaced.

Entire Structure, Grade Separation – add traffic control. (*sft*)

Entire Structure, Over Water – add traffic control. (*sft*)

DECK REPAIR / TREATMENTS

Bridge Railing Replacement – includes removal and replacement. Cost estimate is based on partial deck removal to develop lap length for barrier reinforcement. (*ft*)

Concrete Brush Block/Curb Patch – includes hand chipping and formwork. (*ft*)

Concrete Barrier Patch – includes hand chipping and formwork. (*sft*)

Concrete Deck Patch – includes hand chipping. (*sft*)

Deep Overlay – includes joint replacement and hydrodemolition, add bridge railing if required. Add “Overlay Removal” if there is an existing overlay on the deck. (*sft*)

Epoxy Overlay – includes warranty, surface preparation and application. (*syd*)

Expansion Joint Gland Replacement – includes removal and replacement of strip seal neoprene gland *(ft)*

Expansion Joint Replacement – includes removal and replacement. *(ft)*

Full Depth Patch – includes hand chipping and formwork. *(sft)*

Healer/Sealer – includes surface preparation and application. Penetrates cracks in bridge deck. *(syd)*

HMA Overlay with WP Membrane – includes HMA and waterproofing membrane. Add “Overlay Removal” if there is an existing overlay on the deck. *(sft)*

Overlay Removal – includes removal, specify existing overlay type and use associated costs. *(syd)*

Reseal Bridge Joints – includes removal and replacement of end joints and construction joints. *(ft)*

Shallow Overlay – includes joint replacement and hydrodemolition, add bridge railing if required. Add “Overlay Removal” if there is an existing overlay on the deck. *(sft)*

SUPERSTRUCTURE REPAIR

Bearing Realignment/Replacement – includes temporary supports. *(ea)*

Heat Straightening – includes heat straightening, cleaning and coating of damaged steel beam due to high load hit. Costs based on a 35’ length, 3.5” web offset repair. For more localized distortions (i.e. flange only) cost may be reduced to \$30,000. There is a limited number of times a beam can be heat straightened, identify any previous heat straightening work performed. *(ea)*

Pack Rust Repair – use with built up steel sections that exhibit steel plate separation in excess of 3/8”. *(ft)*

Paint – Complete – includes cleaning and coating of entire structure. *(sft)*

Paint – Partial/Spot/Zone – includes cleaning and coating of partial structure. Minimum cost for this work is \$20,000. *(sft)*

PCI Beam End Blockout – includes temporary support, hand chipping and formwork. Use in locations where prestressed concrete beam ends exhibit deterioration affecting structural capacity. *(ea)*

Pin & Hanger Replacement – includes temporary supports, removal and replacement of pin and hanger assembly system. Add cleaning and coating. *(ft)*

Structural Steel Repair – includes cleaning and coating. Cost estimate based on a 6’ repair using a 6” x 9” x 1/2” bent plate. For stiffeners use \$1,500 per steel beam. *(ft)*

SUBSTRUCTURE REPAIR

Substructure Patching – includes hand chipping, add temporary support if required. Field measured x 2, assume 4-6” depth. *(cft)*

Substructure Replacement – includes temporary supports, removal and replacement of substructure unit(s). Replace when repair area is greater than 30% of surface area. *(cft)*

Substructure Horizontal Surface Sealer – includes surface preparation and application to horizontal surface of concrete pier caps and abutment bridge seats. Use on horizontal concrete surfaces located under a joint. *(syd)*

Temporary Supports – includes excavation, installation, removal, and restoration. Add \$1,350 for each steel beam that requires stiffeners. Use engineering judgement to determine support type. Unique situations require complex temporary supports, increase costs up to \$6,000 each for unique situations. *(ea)*

MISCELLANEOUS

Articulating Concrete Block System (ACB) – use for scour countermeasure when deemed appropriate by hydraulics. *(syd)*

Concrete Surface Coating – includes surface preparation and application of elastomeric coating. *(syd)*

Culvert Cleanout – includes removal of sediment and debris *(ft)*

Epoxy Crack Injection – includes flushing and structural crack repair. Minimum recommended width of 0.013", may be used for concrete beams and substructure units. *(ft)*

Metal Mesh Panels – include when deck bottom contains incipient spalls over travelled lanes. Standard panel width is 48", with a maximum 6'-6" length. *(sft)*

Pressure Relief Joint – include in **ALL** projects that contain a significant amount of concrete roadway (in excess of 1,000ft) adjacent to the structure. The purpose is to alleviate the effects of pavement growth that may cause distress to the structure. *(ft)*

Riprap – includes placement of riprap around substructure units. Assume 10ft distance around perimeter. Costs based on pay item with unit price in tons. *(syd)*

Silane Treatment – includes surface preparation and application. Penetrating sealer for concrete surfaces that absorbs into the concrete matrix to reduce moisture intake. Can be used for deck surface, barrier, superstructure and/or substructure. *(sft)*

Slope Protection Repair – includes removal and replacement of slope paving. *(syd)*

ROAD WORK

Approach Pavement, 12" RC – includes removal of existing, add curb, gutter, guardrail, shoulder. Minimum distance of 40ft beyond reference line. *(syd)*

Approach Curb & Gutter – includes removal of existing. Estimate minimum 20ft each quadrant. *(ft)*

Guardrail Anchorage to Bridge – includes anchorage, transition, and posts. Depending on the detail, length may vary from 18'-9" to 43'-9". Anchorage required at each quadrant. *(ea)*

Guardrail – includes removal. Maximum length of 200ft beyond reference line. *(ft)*

Guardrail Terminal – also referred to as guardrail approach/end terminal. Terminal required at each quadrant that has a guardrail ending. Not required if guardrail will tie into existing guardrail. *(ea)*

Roadway Approach Work – use when roadwork is required beyond 40ft from reference lines. Additional cost may be required to transition crown, super, widening, or additional length when raising grade. *(LSUM)*

Utilities – coordinate with the corresponding Region/TSC/Utility/Permit Engineer to determine whether there are utilities at the site of the structure and whether they will be affected by the proposed construction. *(LSUM)*

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.

PROGRAMMING GUIDELINES

PE/PE-S			
Construction Budget	Replacement	Preservation	Special Needs
Under \$1M	24%	18%	16%
\$1M - \$5M	16%	12%	13%
Over \$5M	10%	10%	5%
Over Water	20%	20%	15%

CE			
Construction Budget	Replacement	Preservation	Special Needs
Under \$1M	18%	17%	18%
\$1M - \$5M	16%	15%	15%
Over \$5M	14%	13%	15%
Over Water	18%	16%	16%

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

MOBILIZATION – Estimate at 10%

INFLATION – Use 4% per year, starting with year 2024, per direction from MDOT Planning.