

HINGED BRIDGE HANDLING PROCEDURES



MUSTANG EXTREME'S HINGED BRIDGE

ENGINEERED FOR RAPID DEPLOYMENT AND EFFICIENT TRANSPORT

Designed for spans up to 50 feet, our Hinged Bridge is engineered using vehicular rating systems to maximize safety and minimize freight and installation costs.



Constructed as one assembly with guardrails and timber deck pre-installed, the bridge is hinged lengthwise. This allows it to be folded in half for accommodation as a legal transport on a single flatbed truck. Able to be installed without the construction of permanent abutments and other related civil engineering, the hinged bridge is ideal for off-road rapid deployment where heavy equipment site access is needed.

When properly planned and scheduled, installation can typically be completed in approximately 4 hours with standard excavating equipment such as a track backhoe or a crane. If access to the placement location is limited, the bridge can be "skidded" into place with a dozer or backhoe.



TEMPORARY FOUNDATIONS/BEARING SURFACES

Mustang Extreme typically recommends 4 feet of solid contact with abutment supports under each side of the bridge. For example, a 50-foot Hinged Bridge would cover 42 feet of clear span, with 4 feet of support on each side.

Abutment and bearing requirements are dependent on the stability of the stream banks and local soil conditions. It is the customer's responsibility to determine the appropriate level of analysis for their specific use. Since bridges are typically used for temporary site access with limited traffic volume, most customers do not perform a formal analysis, but rely on their construction expertise to evaluate the abutment locations prior to installation.

Examples of abutment materials used successfully include:

- precast concrete blocks
- timber mats
- rock-filled gabion baskets
- crushed stone pads
- native ground



INSTALLATION SITE PREPARATION

- Prior to installation, ensure the site is properly prepared.
- Heavy duty mat access roads are typically used for ground support for remote off-road bridge installation locations.
- If needed, clear trees from the site.
- Provide a level and uniform bearing surface at each end of the bridge.
- Ensure the area is free of mud or debris. Any foreign matter between the double hinge plates will prevent the bridge from opening fully.

OFFLOADING

Our hinged bridges are designed with heavy-duty tow bars, tapered beam ends and additional reinforcing. They can be “skidded” via pushing/pulling with heavy equipment at one or both ends or carried between two pieces of equipment.

The most common method of offloading and installation is using a crane. The exact crane required should be determined based on the weight of the bridge (included with your quote), length of bridge (with lift points on both ends) and the specific job site requirements. A crane may be required to transport the bridge from truck unloading site to the installation site. Mustang Extreme typically recommends a 110-ton crane with one operator and two riggers, rented for the day, to perform the install/removal – but always defer to the expertise of a crane rental business. It is possible to remove the top hinge pins and split the sections apart to set them individually and cut handling weight approximately in half.



If the “far” side of the crossing can be accessed with a piece of heavy equipment (ideally an excavator), the bridge can also be pulled across the span and into position. This method requires the bridge to be sent to job site on a winch truck – which must be specifically requested from Mustang Extreme. Otherwise, the bridge will arrive on a standard 48’ / 53’ flatbed truck.

TYPICAL RIGGING SETUP

Use the towbars located at each end of the bridge as the attachment points for rigging, regardless of whether the bridge is folded or open, being picked or “skidded,” and whether it’s being handled by a crane or excavating equipment.

To prepare for offloading from the delivery vehicle, encircle each towbar with two chains or endless nylon slings. The bridge is weighted towards the hinge side, so the rigging may need to be placed off-center for a balanced pick up. Lift the bridge a couple of inches to confirm the load is balanced before proceeding further.



SKIDDING THE BRIDGE

The bridge skids best when it is in the open position. Regardless of whether the bridge is being skidded folded or open, care should be taken to ensure hinges and diaphragms are not damaged during the process. Specific site conditions will dictate what type of equipment is best suited for a particular application. This will be determined in a pre-installation site survey.



OPENING THE BRIDGE

- Ensure lower hinge pins are removed.
- Ensure the area to be occupied by the section being opened is completely clear of any obstructions, as well as personnel.
- Place rigging around exterior stringer/tow bar on the folded half (at either end), using a basket hitch (see photo). Nylon straps are ideal, although chains will also work. Approximately 3' of strap/chain above the stringer is required to maintain clearance between the machine and the guide rail as the bridge is folded open.
- Swing the folded half open in a smooth, controlled manner. The rigging should slide/rotate as the section is unfolded.



COMPLETING THE INSTALLATION

Once in place, the bridge is unfolded and four pins are installed to maintain the open position. Install the pins, starting on the side of the crossing opposite the equipment. If the bridge is not sitting perfectly level, raise or lower one section to allow the hinges to align properly. To accomplish this, lift by the rigging around the tow bar at an exterior corner of the bridge, or the interior corner of the double-hinge half. The lifting point is dependent upon the direction of movement required to effect proper hinge alignment.

Lastly, a series of steel “center panels” drop in place by hand to cover the hinge location. Install center panels using the “T-handles” provided. The panels are interchangeable with the exception of the (two) panels located at each end of the bridge. These panels are easily identified by the centering pins (which are not present on any of the other panels).

Typical installation time after bridge placement is one hour with one laborer, plus equipment operators.



RAMPING THE BRIDGE

There is approximately 19 inches in height between the bottom of the beam flanges and the top deck of the bridge.

At the abutment or end bearing locations or bridge access points, the change in elevation can be achieved with ramps.

Typical materials used for ramps include, compacted soil, graded aggregate base, mulch, wood chips or crane mats. For longer term installation, soil and stone ramps can be covered with a topping of asphalt.



REMOVAL

- Remove mud/debris from deck surface.
- Place tires on double hinge half in front of vertical guard post(s) at each end of the bridge for shock absorption.
- Remove center panels and lay them out in the CENTER of the double hinge half. The end panels with the centering pins should be removed first and placed immediately “inboard” of the tires, with subsequent panels placed partially overlapping the previous panel (see attached diagram and photo). If the panels are too close to the guide rail or too close to the hinge, the bridge will not fold shut properly and damage to center panel, hinges, and decking may result.
- Remove lower hinge pins and place in adjacent ring for storage during transport to prevent damage/loss.
- Fold single hinge side shut by rigging bridge in the same manner as used to open the bridge.
- Ensure the center panels are not contacting the deck surface or guide rail of the folded half. If they are, re-open the bridge and reposition the center panels to provide the required clearance, then re-fold the bridge.

