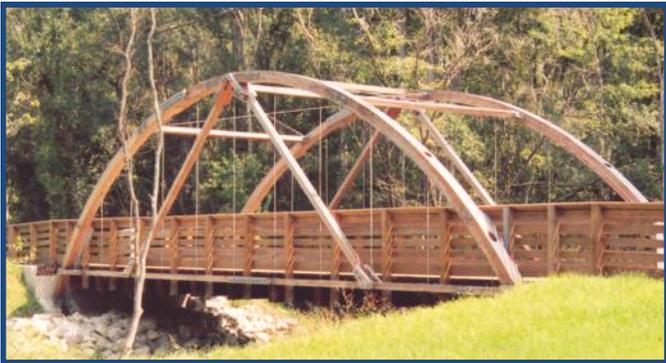
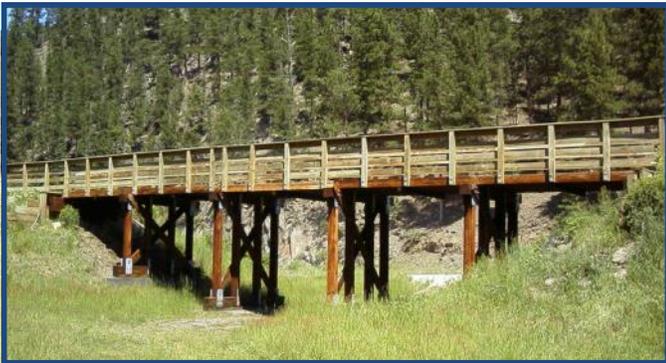


Wheeler

TIMBER RECREATION BRIDGES



INTRODUCTION

With a variety of designs to choose from Wheeler can provide a timber bridge to enhance your project. Designed as a field installed kit or fully assembled, these bridges are used for regional hiking/biking/equestrian trails, snowmobile routes, golf courses, single lane residential access, etc.

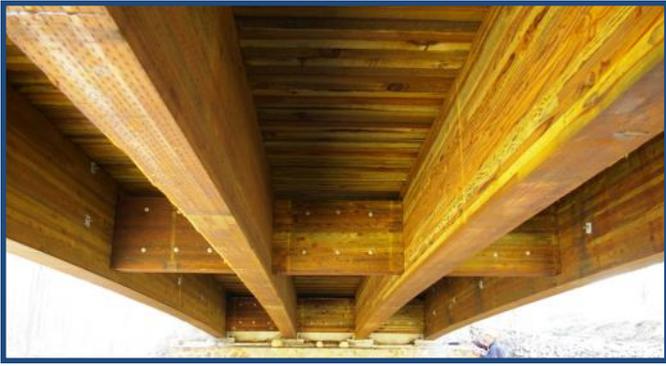
ENGINEERING

Specifications are developed specific to the project to ensure the bridge meets your needs. All aspects are considered including: application, configuration, geometry, loading, materials, etc. A custom design is then created by our registered Professional Engineers. Wheeler reviews the material options for each component and then selects the appropriate combination of strength, durability and economy. Detailed plans are generated by our staff of drafters. Wheeler can provide sealed plans for projects nationwide.

Typical live loads may include pedestrian, equestrian and maintenance vehicles. Utility dead loads are not uncommon.

FOUNDATION DESIGN

Timber bridge kits are compatible with most foundations. Substructure design may be available. Site and soils information, including grade elevations and soils report with geotechnical engineer recommendations, will be required prior to substructure design and may affect design fee.



TREATED WOOD

For main structural components such as stringers, truss and arch members, solid sawn and glued-laminated materials are compared to balance strength properties, camber requirements and material economy. We recommend these materials be treated with an oil-borne preservative such as Wheeler's QNAP.



Oil-borne preservatives are waterproof. This is important for larger members. The oil-borne preservative prevents water moving in and out of the wood and limits dimensional changes due to swelling and shrinking. These members are pre-framed prior to treatment for easy assembly and added durability. Oil-borne preservatives have consistently demonstrated a service life in excess of 50 years for well designed and detailed structures.

Waterborne preservatives are used for components that will be in intimate skin contact. There are a variety of preservatives available depending on the species of wood.

Preservatives using light solvent carriers offer performance similar to oil-borne with a dry to the touch surface, but at a premium price.

Naturally durable wood species can also be considered when treated wood is not desired. The service life varies by species. Naturally durable species are typically more expensive than treated wood.

Plastic composite lumbers vary widely. Some can be considered depending on the loading requirements of the bridge. The stronger products are considerably more expensive than treated wood.

Fiber Reinforced Polymer (FRP) composites are also available for certain decking applications.

All hardware used for Wheeler bridges is hot-dipped galvanized and should last the life of the structure. Periodic tightening may be required.

STRINGER



The Stringer bridge starts with solid sawn, glued-laminated, steel or FRP longitudinal stringers. Solid sawn and FRP are used for spans under 30 feet. Glued-laminated or steel stringers are used for spans over 30 feet and all cambered spans. Decking is provided by transverse timber planks or pre-fabricated timber panels. FRP and composite decking can be consider for some loading conditions.

Spans 10' - 80'



PANEL-LAM



The Panel-Lam is used to accommodate heavier vehicles more efficiently or to build small spans in fewer pieces. They are ideal for areas prone to flooding. The solid panel offers a low profile and stands up to rushing water. If washed out it can be dragged back in place. Technology long used for highway bridges provides the platform for many recreation applications.

Spans 10' - 40'



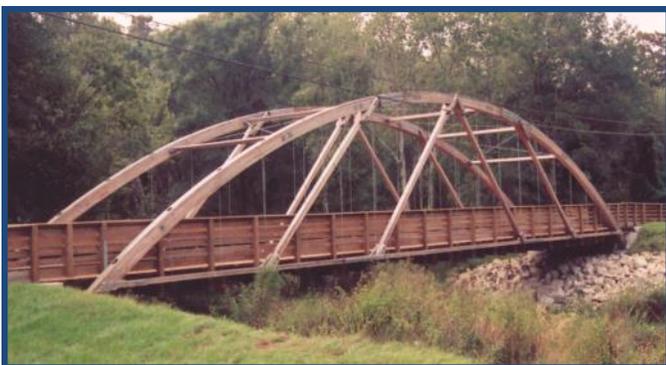
TRUSSED ARCH



The elegance of engineered wood provides the basis of the Timber Trussed Arch. The dynamic curves of the glued-laminated arch are subtly complimented with steel and hardware.

Tall enough to provide clearance under the overhead bracing, the design invites people to pass through and experience the complex engineering.

Spans 70' - 120'



PRATT TRUSS



Wheeler combines timber with internal steel connectors to produce a spatial truss with a striking appearance. With the ability to handle pedestrians or maintenance vehicles, it's the perfect centerpiece.

Designed as a kit, the trusses are shop manufactured. Depending on the overall size, the bridge is shipped in components or completely shop assembled. The railing is attached directly to the trusses. Wind bracing placed outside the trusses provides dramatic architecture and additional clearance under the bridge.

Spans 30' - 60' (5' increments)



RAILING

When treated lumber is used, the treatment depends on the level of contact expected. Oil-borne preservatives are the most durable and can be conditioned to reduce the surface oil, but if it is anticipated people will congregate on the bridge and lean over the railing, oil residue may stain a white shirt. In this case, we recommend a waterborne preservative for the railing and possibly the decking. Waterborne preservatives can be painted or stained, but this will require on-going maintenance. We recommend leaving the natural weathered appearance.



HORIZONTAL



VERTICAL PICKETS

Safety rail spacing can vary by code, but AASHTO standards are typical. Horizontal rails are most common. Vertical pickets provide an urban architecture. Composite lumbers have been used for railing. Their service life is harder to predict based on lack of history and variability of the products. Handrails can be added if ADA requirements apply.



Custom railings are easily applied to most bridge designs. Please review custom railing requirements prior to requesting price estimates.



Service life for decking and railing can vary by the materials used. Often components are replaced for aesthetic reasons before they wear out. Most options provide 15 to 25 years with minimal maintenance.



DECK MATERIALS

The bridges are typically designed with either a treated timber plank or panel deck system depending on application and loading. Longitudinal or transverse orientation is dictated by the floor system design. FRP composite is an option.



TREATED TIMBER PLANK



TREATED TIMBER PANEL



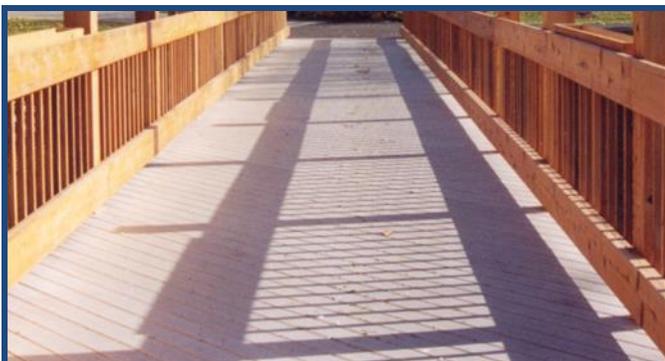
TIMBER WEAR COURSE

Applied for added abrasion resistance, this is common for multi-use applications including equestrian and snowmobile traffic. Often the wear course is installed diagonal to the bridge centerline.



ASPHALT WEAR COURSE

An asphalt wear surface can be added to panel decks. The panels can be used longitudinally or as a transverse deck over stringers. The panels are interconnected to minimize asphalt cracking.



RECYCLED COMPOSITE

Recycled composite decking is not recommended for bridges requiring a wheel load. Manufacturers provide limited design data. It can be used as a wear surface.



SHIPPING

Timber bridges are shop manufactured with all practical pre-framing done prior to treatment. Some field cutting and drilling may be required.

Bridges spanning less than 60' in length with a deck width not more than 8' can be shipped assembled.

***Bridges are shipped via independent carrier. Delivery is made to a location nearest the site, which is easily accessible to normal over-the-road tractor/trailer equipment. Oversized loads warrant additional consideration and providing suitable access shall be the responsibility of others. All trucks delivering materials will need to be unloaded at the time of arrival.*

INSTALLATION

Most timber bridges are shipped as a kit, assembled at the site by others. Detailed plans are generated unique to each project. A bill of material notes the description and function of each piece. All hardware is typically included.

Shop assembled bridges are shipped complete, ready for unloading and installation.

***All unloading, field erection and installation is the responsibility of others.*

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