

Professional

Engineering

Services

Zander Park Trail Expansion

Report

Village of
Cross Plains, WI
October 2015





Strand Associates, Inc.®

910 West Wingra Drive

Madison, WI 53715

(P) 608-251-4843

(F) 608-251-8655

October 6, 2015

Mr. Matt Schuenke
Administrator
Village of Cross Plains
2417 Brewery Street
Cross Plains, WI 53528

Re: Zander Park Trail Expansion

Dear Matt,

Strand Associates, Inc.® is pleased to provide the following information for the Village of Cross Plain's (Village's) Trail Expansion project through the existing Zander Park.

Thank you for the opportunity to provide this engineering service to the Village. We are able to assist the Village with future project phases including design, bidding, and construction-related services, if desired.

Please call me with questions.

Sincerely,

STRAND ASSOCIATES, INC.®

A handwritten signature in black ink, appearing to read 'Tom Stetzer', written over a light blue horizontal line.

Thomas G. Stetzer, P.E.

Enclosures: Report

c/enc.: Jerry Gray, Village of Cross Plains

Report for Village of Cross Plains, Wisconsin

Zander Park Trail Expansion



Prepared by:

STRAND ASSOCIATES, INC.®
910 West Wingra Drive
Madison, WI 53715
www.strand.com

October 2015



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Strand Associates, Inc.[®] is pleased to provide the following information and enclosed conceptual layout and associated cost opinion for the Village of Cross Plain's (Village's) Zander Park Trail Expansion along Black Earth Creek.

The trail and pedestrian bridge layouts and cost opinions were developed using aerial photography and 2-foot contour mapping in conjunction with discussions with agencies and railroad representatives. The trail is assumed to be a 10-foot-wide asphalt trail to match the existing sections of trail that were installed in 2013. In areas where wetlands may be present, a 10-foot-wide boardwalk is assumed. For the prefabricated steel truss bridges, a weathering steel Pratt-style truss is assumed. Manufacturer's literature for the proposed pedestrian bridges and boardwalks is included as an attachment to this report.

1. PERMITS AND REGULATORY APPROVALS

The following agency and regulatory approvals are anticipated prior to construction.

- a. Wisconsin Department of Natural Resources (WDNR) Water Resources Application for Project Permits (WRAPP).
- b. WDNR Chapter 30 General Permit for Clear Span Bridge Over Streams.
- c. WDNR Wetland General Permit for Recreational Development.
- d. Federal Emergency Management Agency (FEMA)–Potential coordination needed for pedestrian bridges.
- e. Office of the Commissioner of Railroads (OCR)–Railroad crossing approval.

The WDNR Fisheries department is currently in the process of updating a master plan for creeks in the driftless area that includes Black Earth Creek. The current master plan does not allow new paths to be constructed on WDNR property. The WDNR suggested that the Village continue working with Dave Rowe from the Department to suggest adding language to the master plan that would allow paths to be constructed in urban areas. WDNR land will need to be avoided if the trail project proceeds prior to the WDNR master plan updates.

It is anticipated that WDNR/United States Army Corps of Engineers Section 401/404 permitting would be conducted concurrently for potential wetland impacts, depending on whether boardwalks or an asphalt path is proposed in wetland areas. Impacts will need to be avoided and minimized and potentially limited to 10,000 square feet or 0.23 acres to obtain general permits. It is anticipated that wetland mitigation will be required for any fill and that work in the floodplain will similarly require compensatory storage replacement or balancing of cut and fill operations.

The Office of the Commissioner of Railroads will need to be petitioned to request permission for the proposed path crossing. Wisconsin & Southern Railroad representatives recommended a schedule placeholder of up to one year for this process to take place. If the Village wishes to construct the path in 2017 it is recommended that the OCR petition process be initiated by early 2016.

2. POTENTIAL ENVIRONMENTAL CONCERNS

Following is a list of items that need to be considered when the project moves into the design phase.

- a. A wetland delineation and potential geotechnical evaluation/fill field-screening will be required to determine potential physical wetland impacts, applicability of anticipated permits, and construction limitations.
- b. A WDNR Pre-Application Meeting and Natural Heritage Inventory Screening should be conducted when design efforts are enacted.
- c. A wetland alternatives analysis will be required for confirming project alignment and applicable avoidance, minimization, and mitigation needs.
- d. Application of Protective Area Techniques/Best Management Practices and setbacks for wetland and waterway protection (in accordance with NR 151 Protective Area Standards). An exemption from a minimum 75-foot setback from wetlands or Black Earth Creek may be required.
- e. Ongoing environmental/sensitive area design according to existence of Black Earth Creek wetlands, floodplains, and the creek's Exceptional/Outstanding Resource Water designation.

3. ENCROACHMENTS

The only known encroachments in the proposed trail corridor are two aging bridge structures over Black Earth creek. One is a wooden structure and the other is an older concrete structure. It is our recommendation that both structures be removed when the new crossings are installed.

Note: The Village records or title searches should be conducted on subject properties/project alignment areas to determine whether any conservation easement, previous trail/railroad, or other easements or encumbrances are known for project areas.

4. UTILITY CONFLICTS

The only known utility conflicts are along CTH KP for the western section of the proposed path. There are two overhead electric poles and one electrical transformer along the east side of CTH KP that may be in conflict with a new sidewalk or path, depending on the width of terrace that is desired.

5. EASEMENTS

Following is a list of properties that the Village may need to obtain easements from to construct each section of the proposed trail. It is our understanding the Village may already have secured easements from some of these properties. I have added notes to the parcels that already have easements in place according to our conversations.

- a. Section 1–North of Creek
 - (1) Parcel 113/0707-032-9450-1, Unknown Owner
 - (2) Parcel 113/0707-032-9300-3, WDNR
- b. Section 2–South of Creek
 - (1) Parcel 113/0707-032-9210-2, 1107 Bourbon Road, T&M Business and Storage LLC
 - (2) Parcel 113/0707-032-9265-7, WDNR
 - (3) Parcel 113/0707-032-9712-1, 1401 Bourbon Road, Chester’s Diesel & Automotive LLC
 - (a) Easement is in place.
 - (4) Parcel 113/0707-032-9718-1, 1451 Bourbon Road, Cross Plains Storage LLC
 - (a) Easement is in place.
 - (5) Parcel 113/0707-032-9725-1, 1501 Bourbon Road, Cross Plains-Berry Fire District
 - (a) Easement is in place along the north side of the property. Easement is needed to install trail along the east or west edge of the property.
 - (6) Parcel 113/0707-032-9740-1, 1601 Bourbon Road, Kathy A. Roessler
 - (a) Easement is in place.
- c. Section 3–CTH KP Creek Crossing
 - (1) No easements are anticipated unless path is moved farther from the street.

6. FUNDING AND FINANCING OPTIONS

The Village received partial funding in 2014 through the WDNR’s Recreational Trails Aids (RTA) grant program. The Village submitted an additional grant application through the RTA program in 2015. In addition, the Village submitted a grant application through the Dane County PARC & Ride program. The Village should consider additional applications to these two programs in the future as the project further develops.

The Village may wish to partner with the Wisconsin & Southern Railroad Company (WSOR) in applying for a Wisconsin Department of Transportation TIGER grant for the railroad crossing portion of the path. A representative from WSOR mentioned that if its TIGER grant application was not successful in 2015, WSOR would most likely be resubmitting in 2016 and could consider including a new path crossing in the application.

**ATTACHMENT A
TRAIL CONCEPT LAYOUT**

**ATTACHMENT B
COST OPINION**

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>10/5/2015</u> <u>Extension</u>
Cost Opinion-Zander Park Trail Expansion					
North of Creek (1,550 LF, 10' Width)					
1	Common Excavation	1	LS	\$ 10,000.00	\$ 10,000.00
2	Geotextile Fabric	840	SY	\$ 4.00	\$ 3,360.00
3	Crushed Stone Base Course, 9-IN	840	T	\$ 15.00	\$ 12,600.00
4	Asphaltic Concrete Pavement, 3-IN	215	T	\$ 75.00	\$ 16,125.00
5	Boardwalk Style Path	475	LF	\$ 200.00	\$ 95,000.00
6	Weathered Steel Pedestrian Bridge (50' Length, 10' Width)	2	EA	\$ 125,000.00	\$ 250,000.00
7	Trailhead Parking Area	1	LS	\$ 100,000.00	\$ 100,000.00
8	Erosion Control	1	LS	\$ 5,000.00	\$ 5,000.00
9	Seed Restoration	1	LS	\$ 10,000.00	\$ 10,000.00
10	Signage and Amenities	1	LS	\$ 10,000.00	\$ 10,000.00
Total \$					<u>513,000.00</u>
South of Creek (2,250 LF, 10' Width)					
1	Common Excavation	1	LS	\$ 15,000.00	\$ 15,000.00
2	Hauled in Embankment Material	700	CY	\$ 10.00	\$ 7,000.00
3	Geotextile Fabric	1310	SY	\$ 4.00	\$ 5,240.00
4	Crushed Stone Base Course, 9-IN	1310	T	\$ 15.00	\$ 19,650.00
5	Asphaltic Concrete Pavement, 3-IN	335	T	\$ 75.00	\$ 25,125.00
6	Concrete Path Ramps, 6-IN	120	SF	\$ 7.00	\$ 840.00
7	Truncated Dome Panels, 2FT X 2FT	8	EA	\$ 150.00	\$ 1,200.00
8	Boardwalk Style Path	575	LF	\$ 200.00	\$ 115,000.00
9	Railroad Crossing and Fencing	1	EA	\$ 250,000.00	\$ 250,000.00
10	Erosion Control	1	LS	\$ 5,000.00	\$ 5,000.00
11	Seed Restoration	1	LS	\$ 10,000.00	\$ 10,000.00
12	Signage and Amenities	1	LS	\$ 10,000.00	\$ 10,000.00
Total \$					<u>465,000.00</u>
CTH KP Creek Crossing (275 LF, 6' Sidewalk Width)					
1	Common Excavation	1	LS	\$ 5,000.00	\$ 5,000.00
2	Concrete Sidewalk	1650	SF	\$ 6.00	\$ 9,900.00
3	Truncated Dome Panels, 2FT X 2FT	4	EA	\$ 150.00	\$ 600.00
4	Painted Pedestrian Bridge (60' Length, 8' Width)	1	EA	\$ 125,000.00	\$ 125,000.00
5	Erosion Control	1	LS	\$ 5,000.00	\$ 5,000.00
6	Seed Restoration	1	LS	\$ 5,000.00	\$ 5,000.00
7	Signage and Amenities	1	LS	\$ 5,000.00	\$ 5,000.00
Total \$					<u>156,000.00</u>
Construction Total \$					<u>1,134,000.00</u>
Engineering, Permitting, and Contingencies (30%) \$					<u>340,000.00</u>
Total \$					<u>1,474,000.00</u>

ATTACHMENT C
PEDESTRIAN BRIDGE MANUFACTURER LITERATURE

Wheeler

PREFABRICATED STEEL BRIDGES

APPLICATIONS & LOADINGS

Prefabricated Steel Bridges are ideal for recreation and low volume vehicular bridge applications. The efficiency of the truss design maximizes material properties of the primary tubular steel members. These bridges are used for regional hiking/biking/equestrian trails, community parks, pedestrian overpasses, snowmobile routes, golf courses, single lane residential access, etc. Typical loads may include pedestrian, equestrian and maintenance vehicles. Utility dead loads are not uncommon.

PREFABRICATED

The bridges are shop manufactured with primarily welded connections then shipped to the site ready for installation. Limited field assembly is required for most projects.

SPANS 20' - 200'

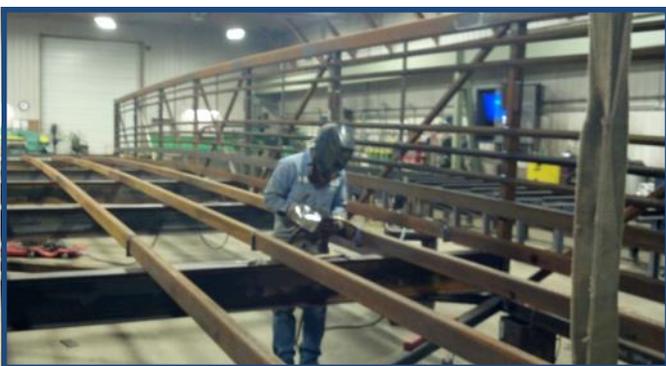
Typical designs allow for clear spans from 20 to 200 feet. Under certain conditions special designs can extend spans to 250 feet. Bridges can be in single or multiple span configurations.

Clear spans up to 100 feet can be fabricated and shipped as one piece if contractor capabilities and site considerations allow. Longer spans are built with field bolted splices and shipped as multiple sections.

WIDTHS 6' - 12'

Widths less than six feet should only be considered for shorter spans. Bridges wider than twelve feet (clear between the railing) may require a longitudinal field splice, increasing the installed cost.





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. Detailed plans are generated by our staff of drafters. Wheeler can provide sealed plans for projects nationwide.

Prefabricated bridges are compatible with most foundations. Substructure design may be available if site and soil information are provided. Site information, including grade, elevations and soils report, including geotechnical engineer recommendations, will be required prior to substructure design and may effect design fee.

FACILITIES & QUALIFICATIONS

Wheeler maintains approved status as a AISC Quality Certified Intermediate Bridge Fabricator with Fracture Critical Endorsement. Our plant certification has been reviewed and approved annually by the AISC since 1998. This certification confirms that Wheeler has "...the personnel, organization, experience, capability and commitment..." to handle these types of projects.



As a member of the American Welding Society, Wheeler employs AWS Certified Welders.

Inspectors from state and independent agencies across the country have visited our facilities and confirmed our ability to produce quality bridges.

Wheeler **PREFABRICATED STEEL BRIDGES**

TYPICAL TRUSS STYLES



WARREN

The Warren truss provides an alternate appearance and offers optimum efficiency for long spans. It is a parallel chord truss with diagonals in alternating directions creating a “W” pattern. The Warren may or may not include vertical members and often uses overhead bracing.



PRATT

The most common truss style is the Pratt. This is a parallel chord truss with diagonal members slanting toward the center of the span and separated by verticals. Double diagonals can be added at additional expense. The Pratt can be built with underhung floor beams, as an H-section (floor beams connected to the verticals) or with overhead bracing.

TYPICAL TRUSS STYLES



BOWSTRING

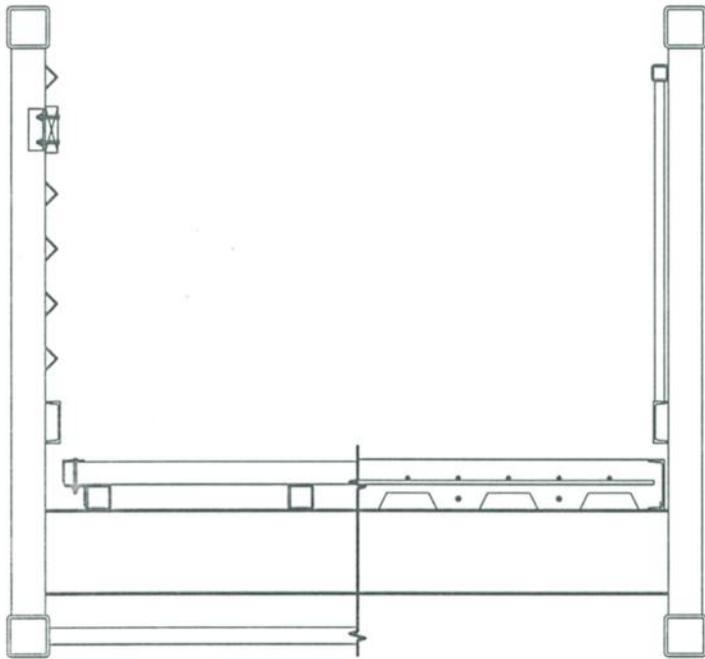
The Bowstring Truss is distinct with the top chord arched relative to the bottom chord. The top chord meets the deck at the ends of the span. It can incorporate Pratt or Warren web configurations and is used in a variety of span lengths for the distinct architecture.



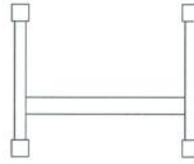
MODIFIED BOW

With a Modified Bow the top chord is arched relative to the bottom, but the chords are separated by verticals at the ends of the span. Pratt webs are typical. The Modified Bow is often used as an affordable alternative to the traditional Pratt and can be used for most span lengths.

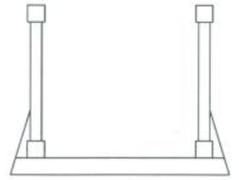
TYPICAL CROSS-SECTION



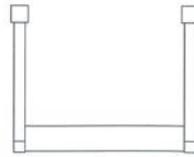
Floor Beam Configuration



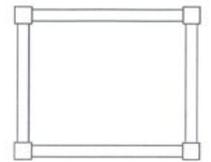
H-section



Underhung



U-section



Overhead Braced

APPROACH RAILING

Approach railing guides users onto the bridge. Custom sections can be built to match or compliment the bridge. Less expensive options utilize treated wood. Regardless of style, approach railing is encouraged.



RAILING

Railing combinations can vary by intended use and differing code requirements. Most bridges incorporate a toe plate, safety rail and rub rail. Orientation for the safety rail is typically vertical or horizontal.



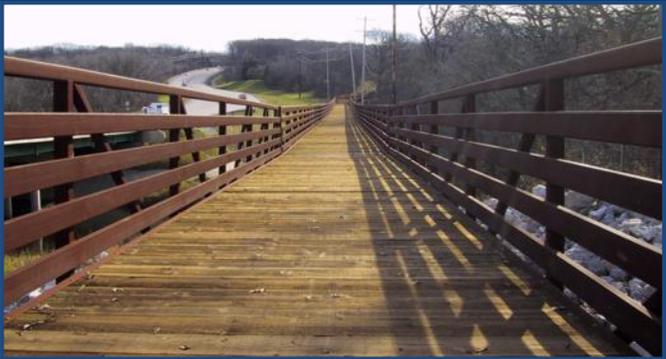
HORIZONTAL



VERTICAL PICKETS

Safety rail spacing can vary by code, but AASHTO standards are typical.

Handrails can be added if ADA requirements apply.



Wheeler recommends incorporating a vertical post at the end of the bridge. This provides easy termination of the safety rail and transition to any approach rail. If slanted ends are preferred, it is still recommended to extend the safety rail to the end of the bridge.

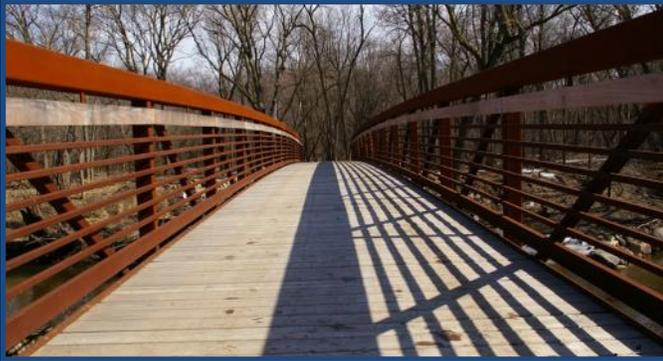


Custom safety railing is available at additional expense. Contact us to review project specific options.



DECK MATERIALS

All bridges are available with treated timber, tropical hardwood, asphalt or concrete decks. Composite and FRP materials may be considered under limited loading conditions. Steel grating has been used for decks requiring more drainage.



TREATED TIMBER

The most economical and easiest to maintain, wood decks are typically shop installed. If preferred, they can be shipped loose to reduce the structure lifting weight and field installed after the bridge is set.



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.



TROPICAL HARDWOOD

Premium wood providing greater dimensional stability and smoother finish. Ipe is the most common specie.



CONCRETE

Asphalt and concrete decks are installed after the bridge is set in position. An asphalt wear surface can be added to structural timber panels or steel bridge plank. Reinforced concrete decks are poured-in-place with shop installed stay-in-place steel deck pans and side forms.



STEEL GRATING

COMPOSITE

There are a wide variety of FRP, PVC, and recycled plastic/wood composite decking materials offered in the market place. The appropriate application of these products must be reviewed project specific. Some products may only be used as a wear surface.

FINISH



WEATHERING STEEL

Atmospheric Corrosion Resistant Self-Weathering Steel is a special formulation that develops a protective oxide patina. Under acceptable atmospheric conditions the steel “rusts” to a patina, eventually stabilizing and protecting the steel from further corrosion. Color of the patina will progress from reddish to dark brown.

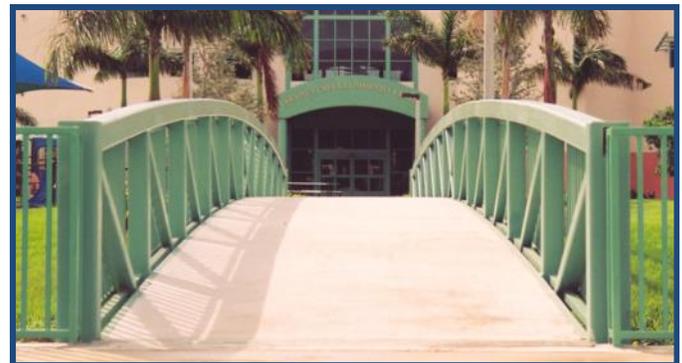


Weathering steel provides an economical choice with a rustic appearance and relatively little maintenance. The bridge will never require recoating and can be blasted to remove graffiti. It will simply rust again in the affected area.



PAINT

Painted bridges can be considered for applications where weathering steel is undesirable. Two and three coat paint systems used for other highway applications are available in virtually any color.



Painted bridges are more expensive due to the cost of materials and application. They also require additional sealing of accessory connections and more extensive sand blasting.

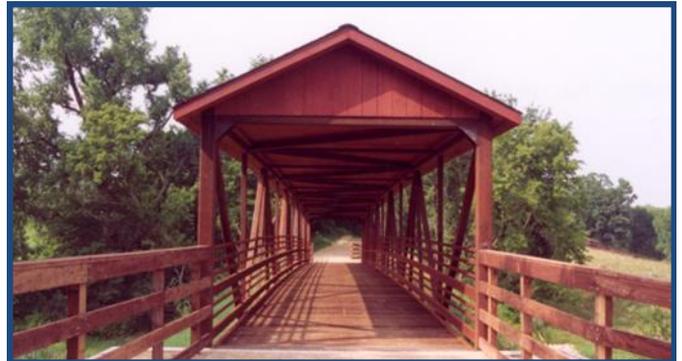


Precautions with weathering steel include rust staining in runoff areas below the bridge and avoiding salt latent atmospheres (coastal areas or bridges over highways requiring winter maintenance).

OVERHEAD BRACING



Overhead bracing can be incorporated into most truss configurations. It often reduces member sizes by adding stability and may be required for the longest spans. The bridge depth of section, measured from the top of deck to the bottom of the lowest member (typically the bottom chord) can be minimized by adding overhead bracing.



For bridges requiring fencing or roofs, designs with overhead bracing are preferred.

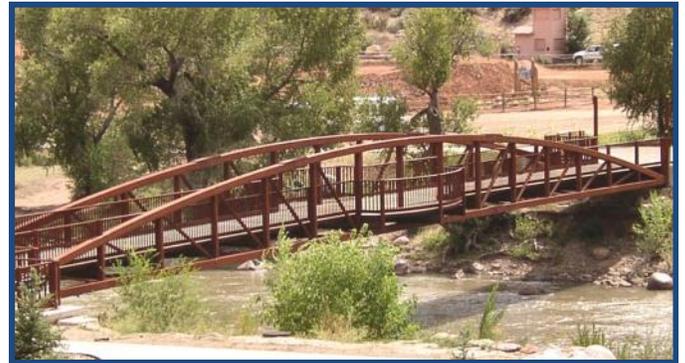
ARCHITECTURAL FEATURES

Wheeler often works with consultants and architects to incorporate specific architectural features. Please contact us to review the potential for your next bridge. We will discuss the feasibility and cost implications of the elements.



ACCESSORIES

Please review your specific requirements with a Wheeler representative prior to requesting price estimates.



OVERLOOKS

Adding a walk-through viewing area provides many opportunities to enhance the user experience. It also allows those who stop on the bridge to move out of the main traffic lanes. Overlooks can be added under certain span and loading conditions. Multiple truss configurations are compatible.



LIGHTING

Lighting design by others. Field installed by locally licensed electrician. Brackets can be shop installed.



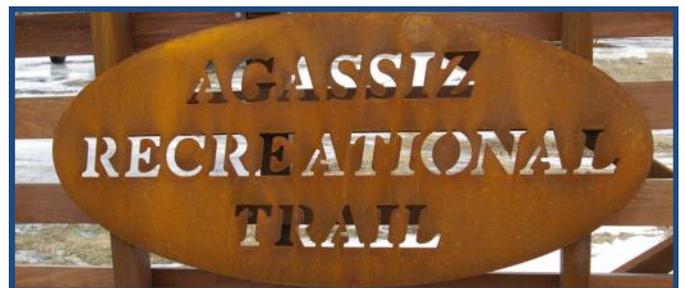
UTILITY HANGERS

All utility design and installation by others. Brackets can be provided when locations are specified.



FENCING

Available in chain-link (galvanized or vinyl coated) or welded wire panels (galvanized, painted or weathering steel)



SIGNS

State-of-the-art plasma table available for cutting images provided in CAD format.



SHIPPING

The bridges are shop manufactured and shipped to the site ready for installation.

Bridge spans less than 80 feet in length are often shipped as one piece without a field splice.

Spans between 80 and 100 feet will be reviewed to determine if they can be shipped without a splice.

Spans greater than 100 feet will be shipped in sections and require field bolted splice connections.

***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

Prefabricated bridges install in minimal time.

Detailed, written instruction in the proper splicing (if required) and lifting procedures will be provided. The method and sequence of erection shall be the responsibility of others.

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

Wheeler

9330 James Ave S

Bloomington, MN 55431

800.328.3986

info@wheeler-con.com

www.wheeler-con.com

PREFABRICATED STEEL BRIDGES

ATTACHMENT D
BOARDWALK MANUFACTURER LITERATURE

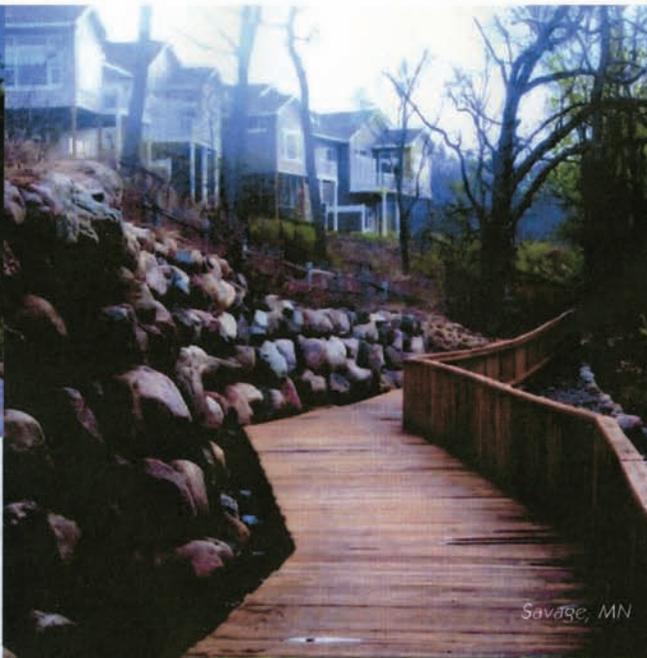


scenic corridors

- ▶ Boardwalks can "Open Up" wetland education and public understanding in a community
- ▶ Boardwalks facilitate bird watching and ecotourism
- ▶ Boardwalks can be used with schools for science education
- ▶ All structural lumber is MCA pressure treated and arsenic free
- ▶ Deck Mate patented fasteners will not strip, cam-out or rust
- ▶ Posts can be extended above deck for seat and bench construction
- ▶ Easy to make the natural twists and turns on your walkway
- ▶ Easy installation—only hand tools required
- ▶ Modular construction with adjustable heights
- ▶ 4', 5' and 6' widths x 8' long sections with various curbs or railings
- ▶ Patented boardwalk footing available in two sizes (US Patent No. 6,421,863)



Schaumburg, IL



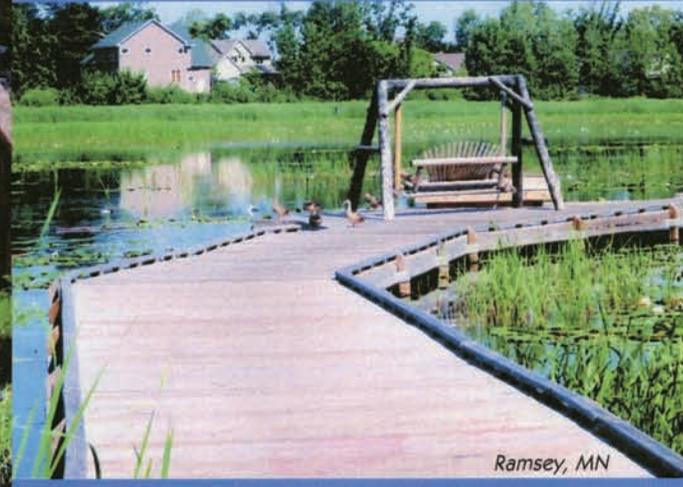
Savage, MN



Harneschfeger Park

CUSTOM MANUFACTURING INC.

BOARDWALKS



Ramsey, MN



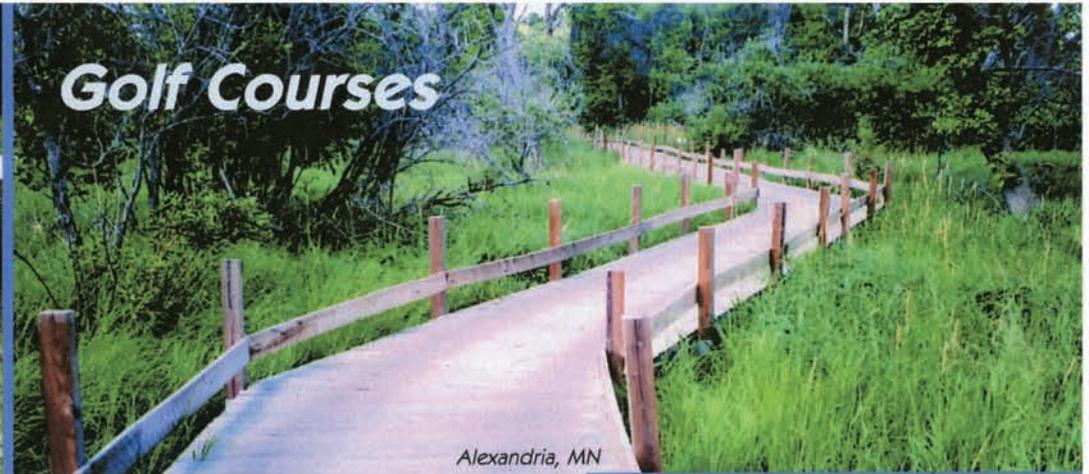
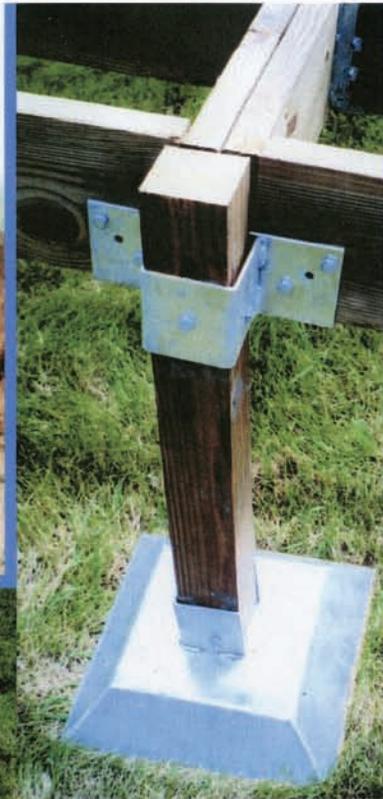
Observation Towers

Park Forest, IL

Boardwalks are scenic corridors for discovering the mystery of wetland areas.

CUSTOM MANUFACTURING INC.

606 Delco Drive
P.O. Box 279
Clinton, WI 53525-0279
(608) 676-2282
Fax: (608) 676-2283
e-mail: custom@inwave.com
www.custommfginc.com



Alexandria, MN



adjustable

Golf Courses

Boardwalk Design Loads:

Design dead load on deck	10. PSF
Design live load on deck, unless otherwise noted	40. PSF
Design live point load on hand railing, unless otherwise required	200. PSF

Material Specifications:

Assumed soil bearing capacity without soil bearings	1500. PSF
All structural lumber is ACQ pressure treated and arsenic free southern pine MSR 2.0E rated, with bending fiber stress of	2,400. PSI

All structural steel members meet ASTM A572 / A992 Grade 50. 50,000. PSI

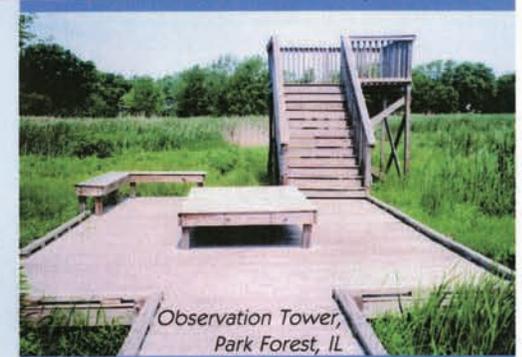
All structural steel connecting hardware meet ASTM A36 and is hot dipped galvanized. 36,000. PSI

Steel pans meet A36 and are hot dipped galvanized. 36,000. PSI

All hardware for connecting steel members is zinc coated and all hardware for connecting wood members is hot dipped galvanized.

Joist connectors are Simpson A35Z and LUS26Z

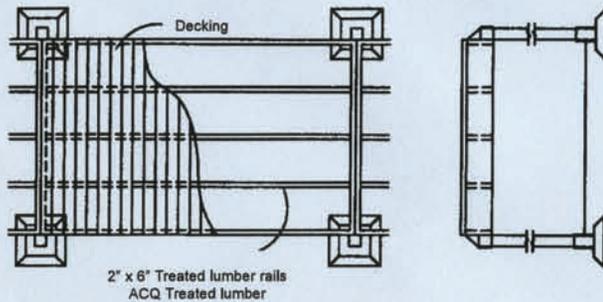
Deck screws are deckmate square-drive by Phillips Fastener Products, Inc. with Evercote finish.



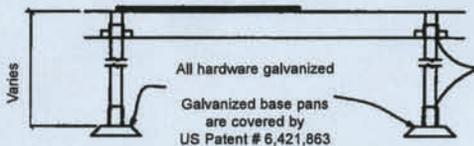
Observation Tower, Park Forest, IL



Farmington, MN



2" x 6" Treated lumber rails
ACQ Treated lumber



All hardware galvanized
Galvanized base pans are covered by US Patent # 6,421,863

Hot-dip galvanized brackets

TYPICAL PANEL LAYOUT

ATTACHMENT E
RAILROAD CROSSING EXAMPLE

Figure 8C-5. Example of a Shared Pedestrian/Roadway Gate

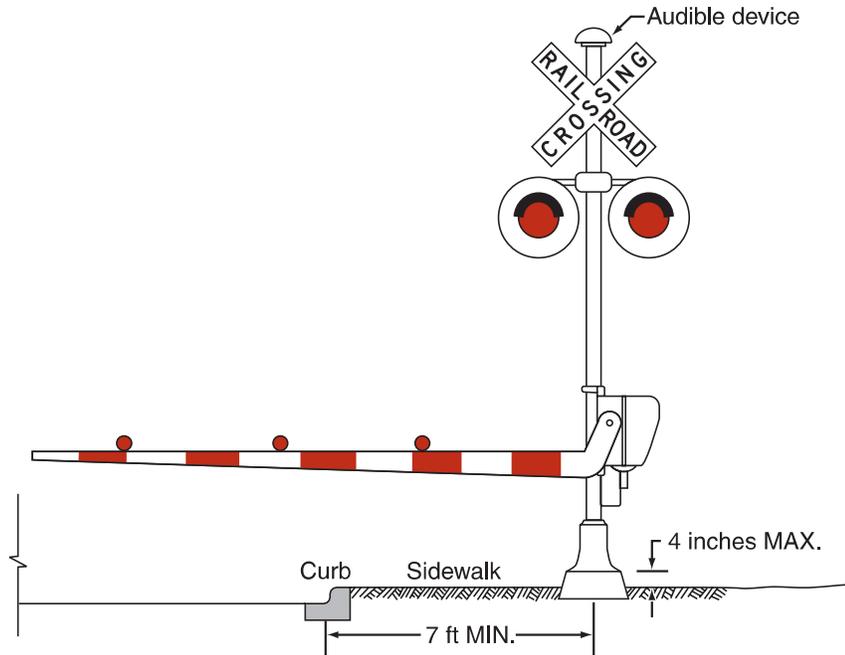
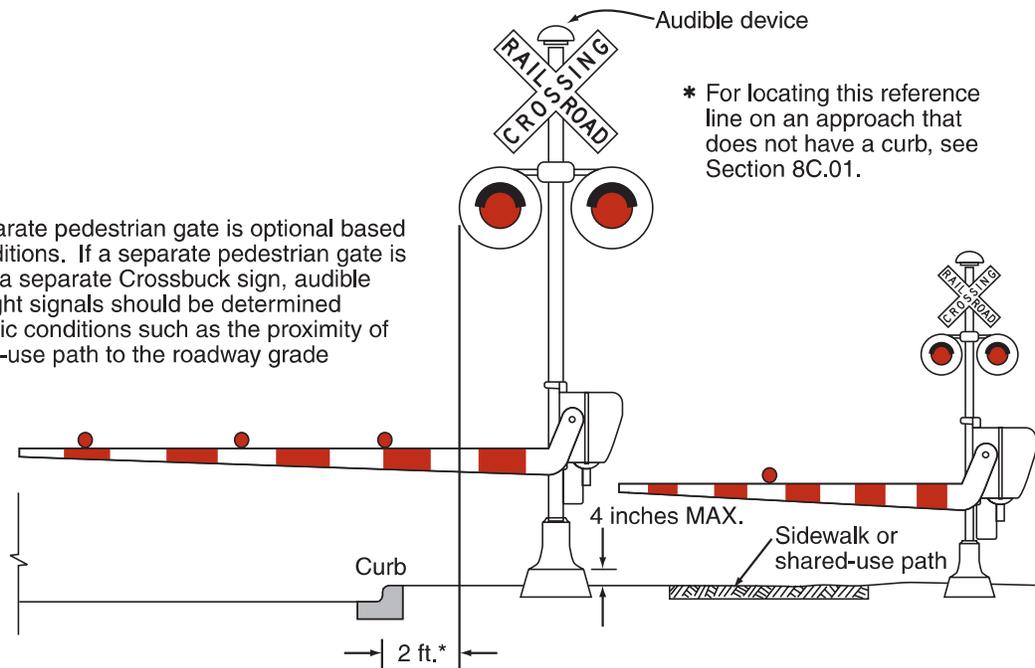


Figure 8C-6. Example of a Separate Pedestrian Gate

Note: The provision of a separate pedestrian gate is optional based upon site-specific conditions. If a separate pedestrian gate is provided, the need for a separate Crossbuck sign, audible device, and flashing-light signals should be determined based upon site-specific conditions such as the proximity of the sidewalk or shared-use path to the roadway grade crossing devices.



* For locating this reference line on an approach that does not have a curb, see Section 8C.01.

Figure 8C-7. Examples of Placement of Pedestrian Gates

