

# Aluminum Bridge Decking

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Durable and tough

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Fast installation

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Cost effective

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## GuarDECK™

**MAADI Group specializes in aluminum bridge decking that is unmatched for durability and lasts several decades. This engineer-designed product is ideal for new or existing bridge retrofit with quick installation and minimal disruption to people and traffic.**

MAADI Group works with municipalities, developers, architects, construction companies, governments and other parties to offer innovative Accelerated Bridge Construction (ABC) that cuts down on traffic interruptions and costly traffic control.





Whether replacing existing decking on an older bridge or building a new one, GuarDECK™ saves time as the mechanical connections are fast and easy to install.

The lightweight system is specially tailored for pedestrians, 15-ton vehicles or less, movable bridges, civil security, temporary bridges, military bridges, maritime structures, and construction platforms.





# Highest Standards

## Design and materials

- 100% recyclable aluminum structural components and energy-efficient recycling.
- Integrates well with new construction and retrofits of existing structures.
- Resistant to salt water, chemicals, and pollution due to its permanent, natural oxide film that prevents corrosion of the aluminum by the environment.
- No welding – the aluminum maintains its full structural integrity.
- Custom T-bolts fasteners in stainless steel 316 series.
- Built-in ribs provide an anti-slip surface.
- Includes dielectric and anti-slip coating between steel and aluminum components.
- No on-site drilling.

## Patents

Patent pending

## Customization

- Aluminum guardrails with a choice of styles and durable anodized and baked paint finishes.
- Optional aluminum curbs
- Optional integrated LED lighting system also available

For more details, [click here](#).

## Award Received

In 2020, GuardDECK™ won 1st place in the Architectural/Structural category at the 2020 Aluminum Extrusion Design Competition, organized by the [ET Foundation](#).

## Easy shipping

- Standard off-the-shelf components available in four weeks, ready to be shipped flat on standard-size trailers anywhere in North America, and in eight weeks anywhere worldwide.

## Fast assembly and installation

- Lighter and easier to install than competitive steel, wood or concrete products.
- A team can install a weld-free aluminum deck and open the bridge to traffic later that same day.

## Maintenance

Virtually maintenance-free and highly cost-effective, compared with steel when total cost of ownership (TCO) is considered.

## Vandalism

Optional anti-theft/anti-vandalism fasteners.

## Warranty

We offer a One-Year Limited Warranty on aluminum against material failure, defects and corrosion.



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## Codes and standards

GuarDECK™ can conform to any of these codes and standards (or to others upon request), and bears the seal of one of our in-house registered professional engineers.

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### Canada

- [CSA S6-19](#) Canadian Highway Bridge Design Code
- [CSA S157-17](#) Strength Design in Aluminum

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### U.S.

- [AASHTO](#) Specifications for Design of Pedestrian Bridges
- AA ADM (2020) Aluminum Design Manual
- [Aluminum Standards and Data \(AS&D\)](#)

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## Partners

Our renowned partners support the development of our new product.

**RioTinto**



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## Sustainable

MAADI Group is committed to implementing the sustainable benefits to improve the environment in every community where our pedestrian bridges are used. MAADI Group incorporates the sustainable design principles of energy conservation, use of recyclable materials, greater functionality and design flexibility. Enhancing the built environment, it offers durable solutions that last decades.

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### Benefits

- Natural material requires meets environmental responsibility requirements.
- 100% recyclable, with high resale scrap value at the end of its lifespan.
- Recycling aluminum scrap requires only 5% of the energy used to make new aluminum.
- Carbon-free aluminum smelter production (it uses renewable power).
- Fully reusable upon deconstruction without any loss of strength or mechanical properties.
- Reduced energy use and pollution during transport due to light self-weight (40% of equivalent steel bridge deck).

Watch  
the video





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**This game-changing aluminum bridge decking offers incredible advantages over traditional concrete and steel construction, such as a lighter weight, resistance to corrosion, and less maintenance.**

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## Applications

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Pedestrian and up to 15-ton  
vehicle bridges

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Maritime Structures

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Civil Security Bridges

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Temporary Bridges

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Military Bridges

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Industrial Bridges

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Extend roadway bridge for  
cantilevered bike path

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# A Cut Above

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## Durability

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## Ease

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## Versatility

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## Longer bridge life

GuarDECK™ represents a cut above in factory aluminum bridge decking. Consistent manufacturing and quality control mean that MAADI Group can deliver faster installation that's also better quality than field-built decks.

This engineer-designed product is ideal for new or existing bridge retrofit with quick installation and minimal disruption to people and traffic. Whether permanent or temporary, this product fits well into most environments and situations where durability and rapid installation are top priority.

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## Facts on aluminum decking

A North American study shows that older projects using aluminum decking instead of concrete, steel and wood have stood the test of time. Between 1946 and 1963, nine bridges were built with aluminum beams and girders and six still exist. Gradually more countries, such as Japan, Norway and Sweden are recognizing the benefits of aluminum versus steel construction, and are using aluminum extrusions in the repair and construction of bridge decks.

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## A foundation for good roads

GuarDECK™ facilitates seamless connections between secondary roads, bike paths, trails, pathways and other structures. It solves complex issues of deficient, narrow or outdated bridges, providing ready made solutions that endure.

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### Lighter than steel

Aluminum bridge decks are 70 to 80 percent lighter than concrete and most metal, (about 10 psf – 0.5 kPa), which makes it easier to handle and install. This lightweight, versatile material reduces dead load and offers increased bridge width and capacity without the need to strengthen supporting bridge elements. This is especially important for load-restricted bridges, historic bridges, movable bridges and bridges with narrow roadways requiring expansions for bicycle paths or walkways.

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### Hardwearing and resilient

Using marine grade aluminum, our bridge decks are virtually maintenance-free and require no chemical treatments that are harmful to human health and the environment, such as those used to protect steel and wood. Lasting up to 100 years, and naturally resistant to corrosion, this bridge deck type is better suited—than steel or concrete—to de-icing during colder months.

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### Accelerated Bridge Construction (ABC)

This unique type of construction allows for a quick-turnaround installation when compared to concrete which typically requires extensive formwork and curing time.

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### Reducing costs matters

Using GuarDECK™ could mean decreasing costs for movable bridges and bridges with long spans where dead weight is considerable.

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### In-factory for faster turnaround

GuarDECK™ is prefabricated in our factory and shipped ready to install with standard manual tools. This system uses custom aluminum hollow extrusions that attach easily to the main steel I-beams with special stainless steel fasteners and clamps. Prefabricated aluminum deck extrusions can be installed faster than other systems and require no on-site drilling or welding.

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### Stands up to cold

This product is ideal for bridges and other highway structures in colder climates. It eliminates concerns about brittle fracture, even in the most severe Arctic weather. The strength of aluminum increases with extremely low temperatures.

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### Aluminum: The eco-conscious metal

MAADI Group is sensitive to climate change. To that end we have designed GuarDECK™ to reduce your project's carbon footprint by using 20 percent recycled aluminum and renewable energy. And we use the most innovative, energy efficient technology to produce the remaining 80 percent of your bridge deck.

Aluminum bridge decks last generations and the components are 100 percent recyclable, and potentially reusable. About 75 percent of all aluminum ever produced is still in use today thanks to recycling programs.

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### Versatile designs

Due to its lightweight and versatile nature aluminum can be shaped into a myriad of designs. Attractive and heavy-duty at the same time, this material creates bridge decking that integrates well into all built and natural environments. Our deck surface also has built-in ribs to prevent slipping.

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### Increased use

A wide variety of cross-sectional shapes of aluminum extrusion has led to the increased use of aluminum for bridge decks. This has signaled the potential in North America and worldwide for its use in other applications.

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### Aluminum's time has come

Over the past decades, aluminum has seen improved properties and advances in knowledge concerning aluminum's mechanical behavior, along with much improved alloys and tempers. The structural engineering community is already using this knowledge, which is gradually translating into more governments and municipalities recognizing the advantages of aluminum.

# Tailored Designs

GuarDECK™ is a versatile and maintenance-free product that you and your team can easily adapt to your particular project.

## Specifications

### Overall bridge span

Unlimited

### Clear width

Varies with I-beam spacing

### Pedestrian load

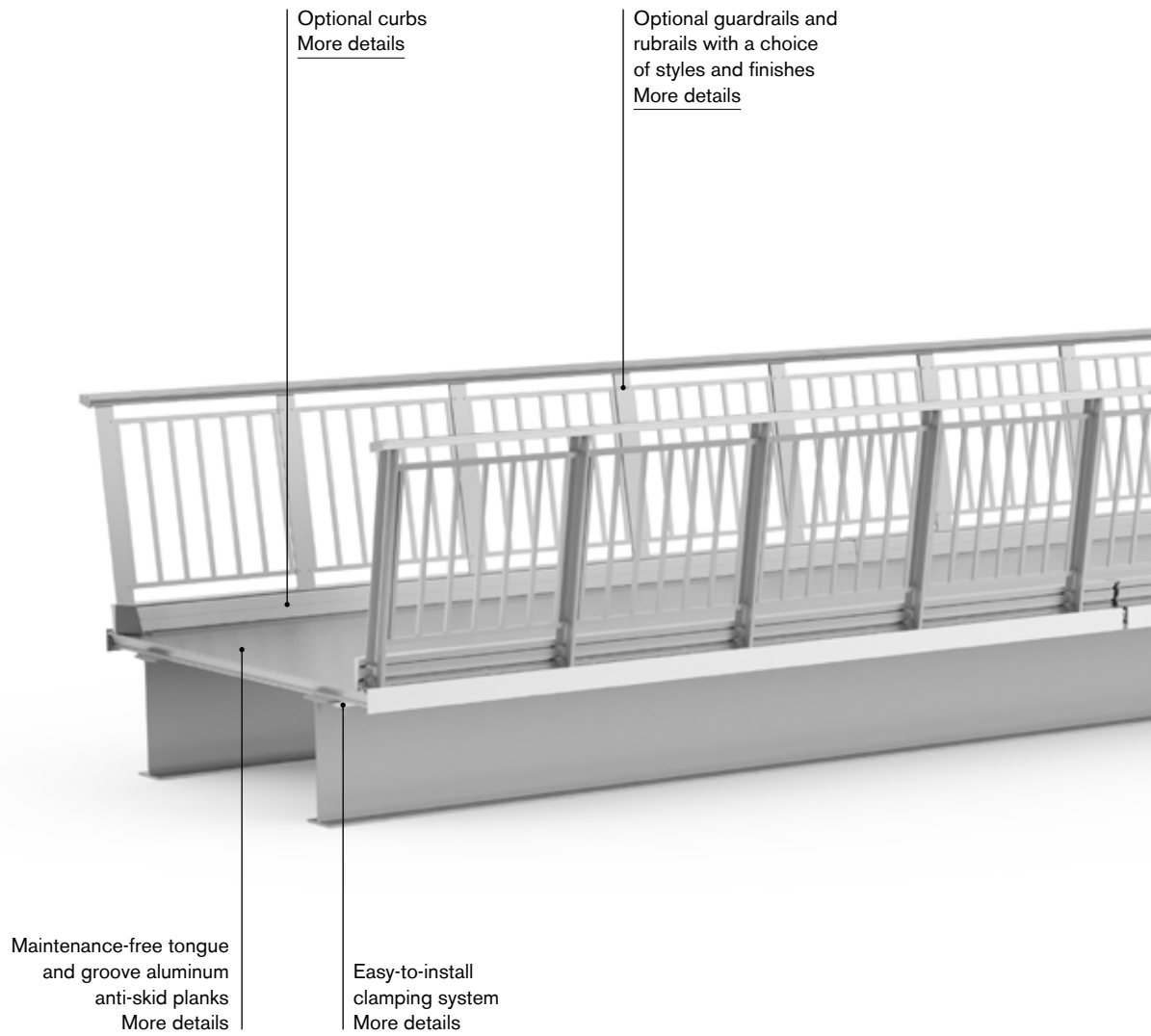
Up to 90 psf (4.3 kPa)

### Vehicular load

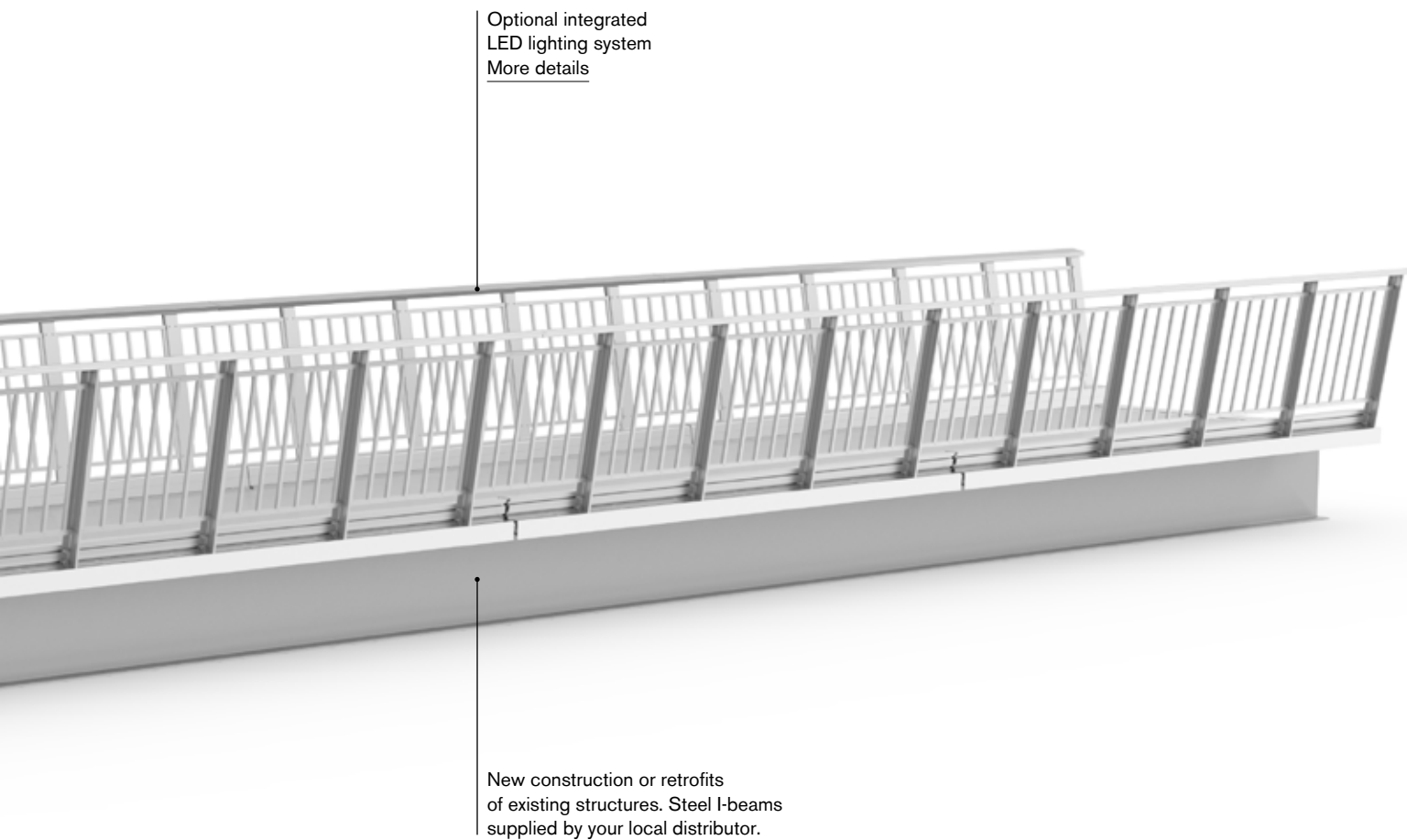
Up to 33,000 lb (15,000 kg)

### Decking self-weight

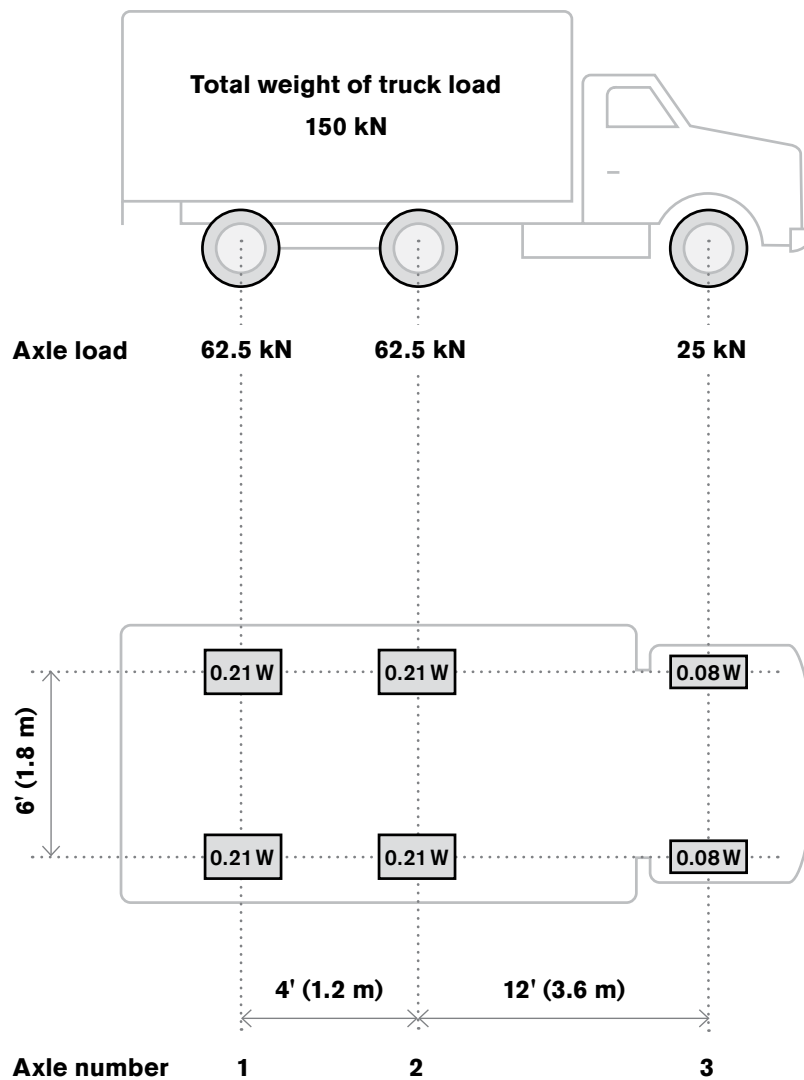
10 psf (0.5 kPa)







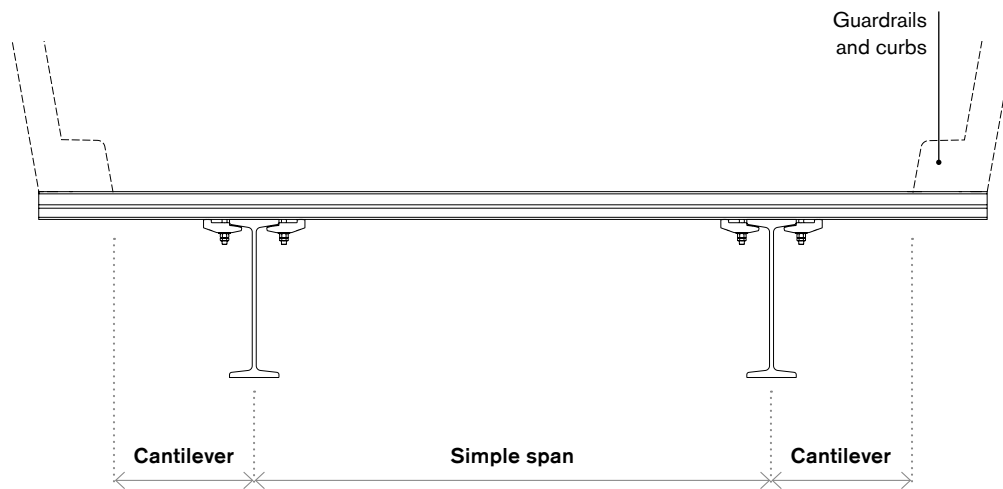
# Vehicular load



The vehicular load shall not be combined with pedestrian load.

$W$  = Total weight of truck load

# Load Chart



Standard	Load	Maximum simple span		Maximum cantilever	
		(ft)	(m)	(ft)	(m)
AASHTO LRFD Bridge Specification (7th Edition) & Guide for Pedestrian Bridges (2009)	Pedestrian 90 psf (4.3 kPa)	13.00*	3.96*	7.21*	2.20*
	H5 Truck 10,000 lb (44.5 kN)	9.52	2.90	2.40	0.73
	H10 Truck 20,000 lb (89 kN)	4.79	1.46	1.20	0.37
International Building Code (2018) & Aluminum Design Manual (2015)	Walkways & platforms 60 psf (2.87 kPa)	14.88*	4.53*	8.82*	2.69*
	Yards & pedestrians 100 psf (4.8 kPa)	12.55*	3.82*	7.44*	2.27*
	Areas accessible by vehicles 250 psf or 8,000 lb (12 kPa or 35.6 kN)	5.24	1.60	1.31	0.40
CSA S6-19	Pedestrian 83.5 psf (4 kPa)	13.35*	4.07*	7.91*	2.41*
	Maintenance vehicle 18,000 lb (80 kN)	6.22	1.89	1.56	0.47
NBCC 2015 & CSA S157-17	Footbridges 100 psf (4.8 kPa)	12.56*	3.83*	7.45*	2.27*

For preliminary design purposes only. Cantilever span exclude guardrails and railings.

\* Span values are controlled by deflection criterias:

- L/360 for simple spans

- L/180 for cantilever spans (L/220 for AASHTO)





# Easy Installation and Handling

Our premium bridge decking product is designed for easy installation. Versatile and sturdy, GuarDECK™ is also built to fit a range of different environments and applications.



## Easy-to-install clamping system

### Specifications

- No on-site drilling or welding
- Clamping system that bolts directly into the planks

### Fasteners

- Custom T-bolt fasteners in stainless steel 316 series
- Extruded aluminum heavy-duty clamps

### Option

- Optional anti-theft/anti-vandalism fasteners



## Anti-skid aluminum decking

### Specifications

- Unlimited lifespan with regular cleaning
- High grip surface
- Maintenance-free and corrosion-resistant – no treatments or sealers required
- 100% recyclable and reusable
- Economical over life of the bridge/structure

### Material

- Natural finish extruded aluminum alloy tongue and groove planks – no paints or coatings required

### Option

- Polyurethane based coating combined with an aggregate dressing provides an extremely durable slip and skid resistant surface

[More details](#)



# Existing Bridge Retrofit

## Before



**This off-the-shelf product is ideal for existing bridge retrofit with fast installation and little disturbance to pedestrians and vehicles.**





After



← Retrofit of existing bridge, Lake Brome, Quebec



# Customization











# Options

Various options are offered to further customize your project to best suit the application and the surrounding environment.



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## Guardrails with vertical pickets

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### Material and finish

- Extruded aluminum alloy with clear anodized finish

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### Specifications

- Less than 4" (102 mm) between pickets – National Building Code of Canada
- Less than 6" (152 mm) between pickets – CSA S6-19 Canadian Highway Bridge Design Code)

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### Heights

- Pedestrians: 42" (1,067 mm)
- Cyclists: 54" (1,372 mm)

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### Options

#### Styles

- Horizontal railings and custom design or available upon request

#### Architectural finishes

- Other anodization colors and powder coat finish are available upon request

# Options



## Handrails

### Material and finish

- Extruded aluminum alloy with clear anodized finish

### Dimensions

- Diameter: from 1 1/4" to 2" (from 32 mm to 50 mm)
- 2" (50 mm) hand clearance

### Height

- Standard: 36" (915 mm)
- ADA<sup>1</sup>: 24" (610 mm)

### Option

- Double handrails (ADA<sup>1</sup>) are available upon request

## Curbs

### Specifications

- Help prevent objects from falling and adds a higher level of security.

### Material and finish

- Extruded aluminum alloy with clear anodized finish

<sup>1</sup> Americans with Disabilities Act



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## Integrated LED lighting system

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### Specifications

- Integrated into the guardrails

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### Options

- Programmable RGB LED
- White LED



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## Anti-skid surface coating

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### Specifications

- Minimum 20-year lifespan depending on use
- Maintenance-free and impervious – no treatments or sealers required

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### Materials

- Polyurethane based system combined with an aggregate dressing provides an extremely durable slip and skid resistant surface

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### Option

- Available in two aggregate dressing finishes: for pedestrians and cyclists or for lightweight vehicles



Visit our [website](#) to  
see our latest projects









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