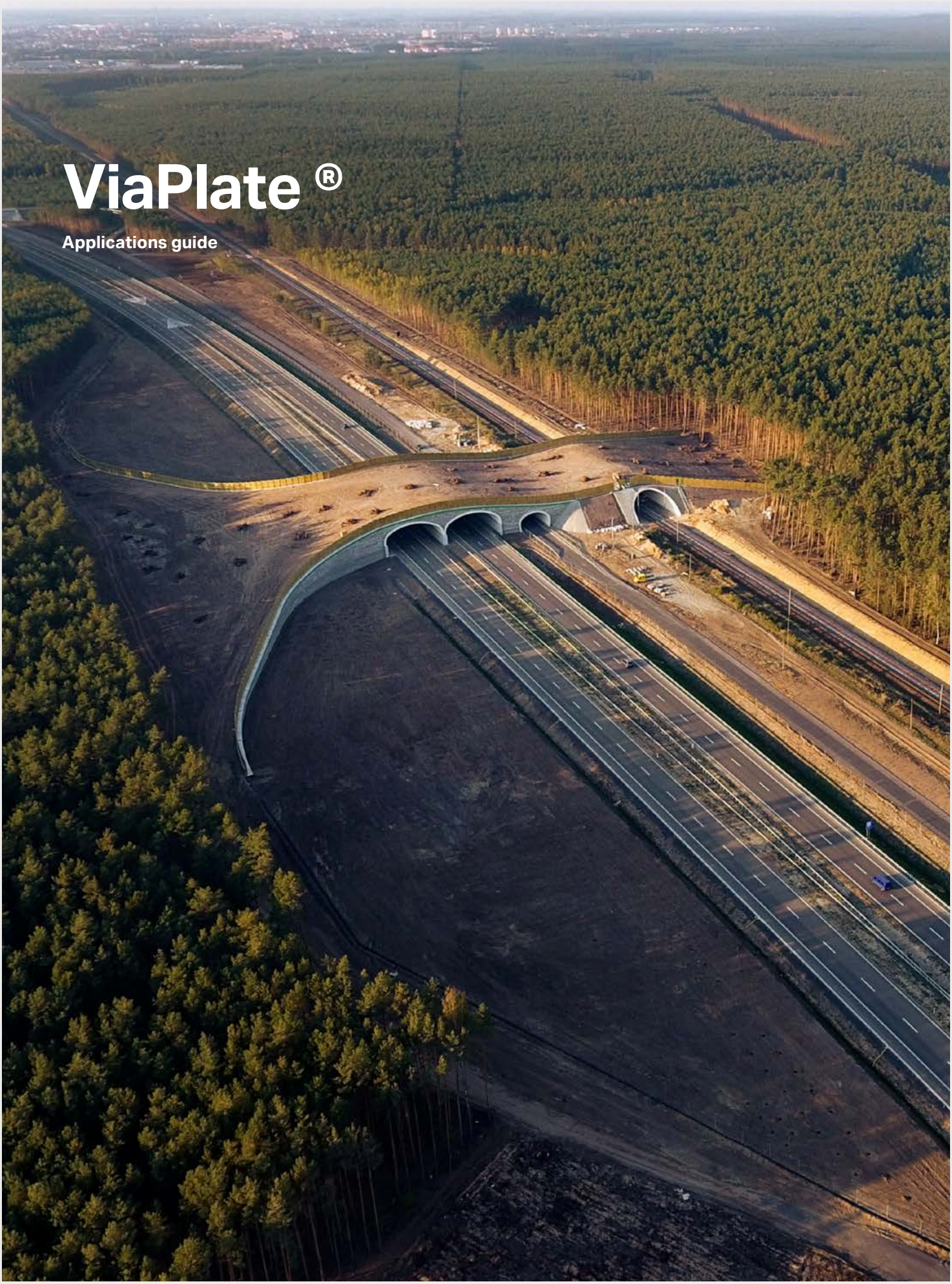
ViaPlate ®

Applications guide



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1. Introduction

Corrugated steel plate structures with thicknesses ranging from 3 mm to 12 mm represent an advanced engineering system used in infrastructure, industrial, and specialized construction. In addition to standard applications such as culverts, small bridges, and wildlife crossings, this technology has broad potential across many sectors of the economy.

Today, thanks to different corrugation types, steel grades, and advanced bearing capacity calculation tools, structures with spans from 1 m to over 30 m can be designed.

2. Industries and application areas

2.1 Road and Railway Infrastructure

For road and railway, corrugated steel plate structures are typically used for:

- road and railway culverts
- road-rail bridges, single- and multi-span
- upper and lower wildlife crossings
- agricultural crossings
- pedestrian crossings, road/cycle bridges, and railway footbridges

Sector benefits:

- fast and modular construction
- shape flexibility related to needs
- cost reduction compared to reinforced concrete structures
- fast & easy transport and installation,
- ability to operate in difficult terrain conditions

2.1. 1 Relining

For road and railway, corrugated steel plate structures are typically used for:

- rehabilitation of existing tunnels, bridges and culverts
- structural strengthening of aging infrastructure
- diameter reduction or adaptation of old structures to new loads

Method benefits:

- cost-effective infrastructure rehabilitation,
- minimal disruption to operation and traffic
- fast installation inside existing structures,
- extension of service life of old infrastructure

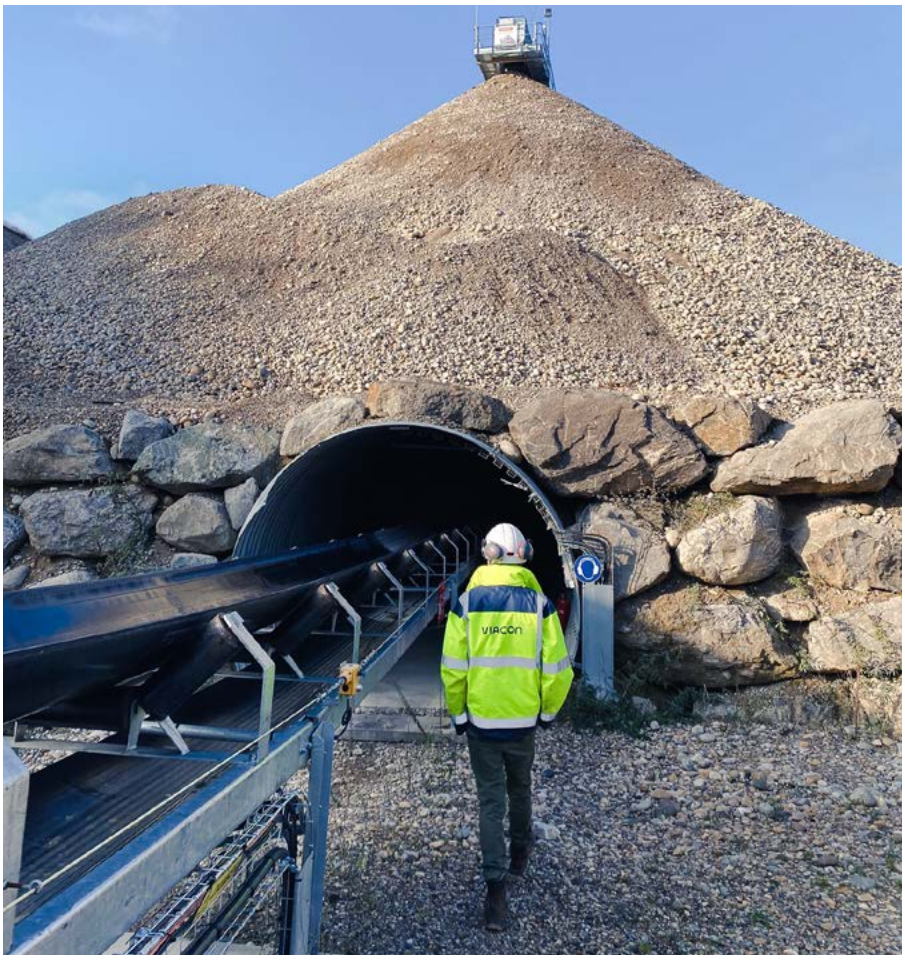
2.2 Mining

For mining industry, corrugated steel plate structures are typically used for:

- conveyor transport tunnels
- technological and service galleries
- ventilation shaft linings
- technological crossings under and over mining roads
- protection covers for infrastructure (crushers, screens, transfer nodes)
- process water retention tanks

Sector benefits:

- high load-bearing capacity under deep soil cover
- ability to operate in mining damage zones
- fast installation in remote locations
- reduction of concrete and formwork works
- containerized segment transport



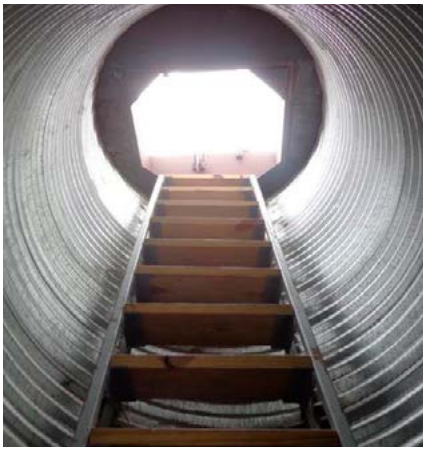
2.3 Defense and Critical Infrastructure

For defense, corrugated steel plate structures could be used for such applications:

- logistic and storage shelters
- emergency place of short-term refuge
- ammunition storage facilities
- protective structures under earth embankments
- hangars
- protective tunnels for energy infrastructure
- semi-permanent and relocatable structures

Sector benefits:

- energy absorption and load redistribution capacity
- design capability for exceptional and dynamic loads
- prefabrication and rapid deployment
- mobility



2.4 Electric Energy, Oil & Gas

For electric energy, oil & gas industry, corrugated steel plate structures could be used for such applications:

- high-voltage cable channels
- energy infrastructure protection
- pipeline protection casings and crossings under infrastructure
- protection of technological installations
- technological channels
- temporary and permanent service tunnels
- underground tank linings

2.5 Logistic, Ventilation and Utilidor Systems

- warehouses, including underground and semi-underground
- protective structures for logistics centers
- transport channels under storage yards
- conveyor belt protection structures
- technological tunnels

2.6 Water Management

- watercourse linings
- buffer reservoirs
- retention and flood protection tanks
- water impurity separator

2.7 Silos and Bulk Material Storage

- large-diameter steel silos
- aggregate storage facilities
- technological chamber linings

Sector benefits:

- high circumferential load-bearing capacity
- large diameter structures
- fast assembly without heavy formwork

2.8 Mountain and Protective Infrastructure

- avalanche protection galleries
- landslide protection galleries
- protective tunnels above roads
- ravine linings
- slope stabilization structures

Sector benefits:

- high resistance to dynamic loads
- structural flexibility
- suitability for difficult terrain

3. Why corrugated steel structures

3.1 Cost Optimization

- reduced concrete consumption
- no formwork required
- reduced wet construction works
- shorter construction time
- reduced heavy equipment costs

3.2 Risk Reduction in Design

- prefabricated and predesign components
- controlled production quality
- repeatable parameters
- predictable soil–steel structural behavior
- proven calculation models

3.3 Speed of Execution

- construction in weeks instead of months
- reduced technological downtime
- minimal environmental impact
- possibility of construction in difficult terrain

3.4 High Durability

- resistance to changing climatic conditions
- advanced anti-corrosion coatings
- design service life exceeding 100 years

3.5 Structural Flexibility

- spans from 1m to 30+ m
- steel thickness 3–12 mm
- various corrugation profiles, steel grades, blots configurations
- possibility of arch, elliptical, and closed shapes, shape customization
- adaptation to soil conditions

4. Summary

ViaPlate corrugated steel plate structures represent an alternative to reinforced concrete and precast solutions across many sectors of the economy. Their advantage comes from the combination of cost efficiency, fast construction, durability, and design flexibility. ViaPlate structures can be engineered with a high strength-to-weight ratio, allowing for lighter designs compared to concrete structures.

Thanks to this high strength-to-weight ratio and other advantages, this type of solution offers strong development potential in mining, defense, industry, energy, water management, and protective infrastructure.

This solution also significantly reduces overall resource consumption and carbon emissions, making it more environmentally beneficial.

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ViaCon is a leader in infrastructure construction solutions. Built on strong Nordic roots, ViaCon embodies a practical, human perspective that brings together technology and verifiable sustainability. The long-term view defines our vision, and by driving smart, future-friendly construction solutions for bridges and culverts, geotechnical and stormwater solutions, we will continue to shape and lead our industry.

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