# OPTEM ARCH

## THE SYSTEM OF PREFABRICATED BRIDGE-TYPE STRUCTURES

OPTEM
ARCH

Independent system of optemARCH prefabricated bridge-type structures is adjusted to the needs of civil engineering.
Optem has developed the solution that can be classified as a rigid soil-shell structure.
It meets high demands of the construction market.
We managed to combine effectiveness with short performance time.
As the interaction between the structure and soil was used, we have obtained a product that is highly economical in relation to traditional solutions.

**OptemARCH prefabricated elements enable the construction of:**

- viaducts and road bridges,
- viaducts and rail bridges,
- footbridges for both pedestrians and cyclists,
- wildlife crossings.

The system consists of:

- optemARCH prefabricated supports that are used interchangeably with monolithic supports being made on the construction site,
- optemARCH prefabricated arch-shaped elements of load-bearing structures.

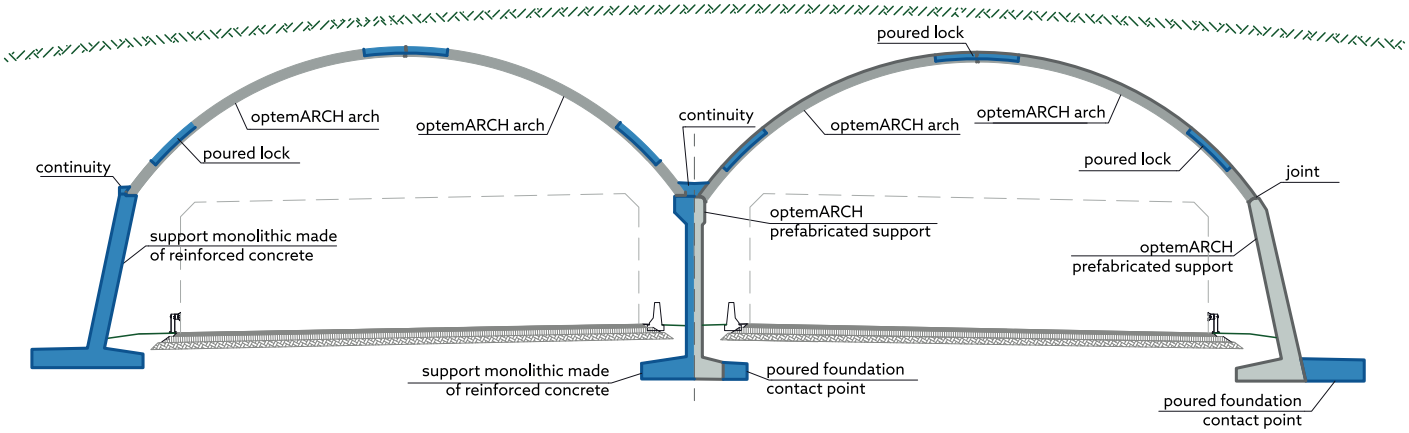
**We have long years of experience and a large engineering staff. The department of optemARCH bridge prefabricated elements is engaged in the construction process at every stage of its performance - from the preparation of design, through the delivery and installation of prefabricated elements, to the execution of construction works.**

## The system consists of:

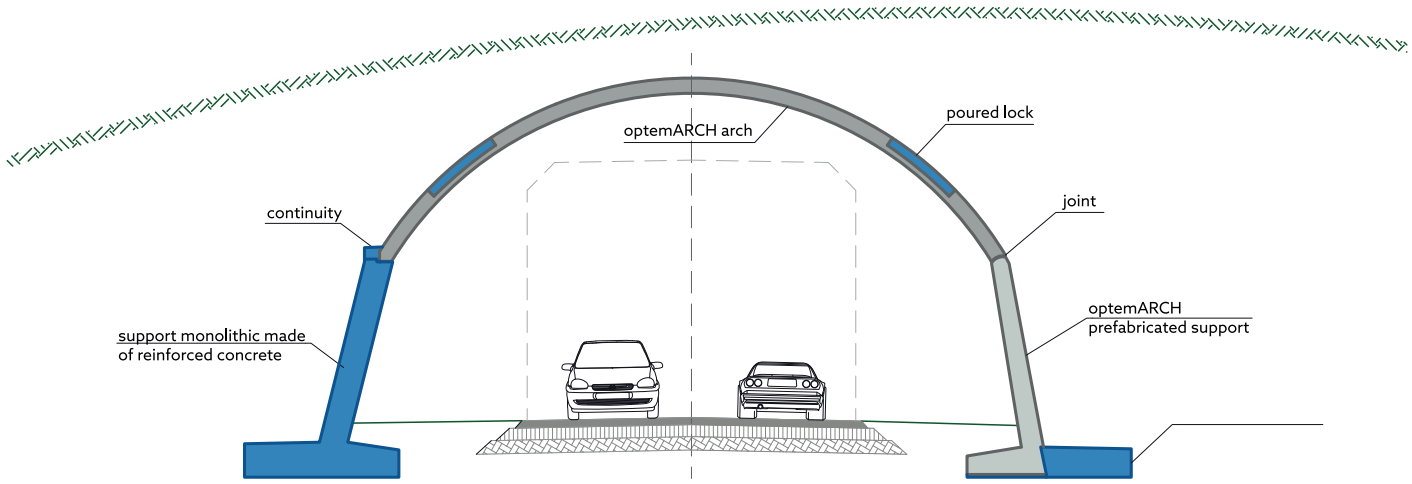
- optemARCH prefabricated walls or monolithic supports
- optemARCH prefabricated arch-shaped elements of load-bearing structures

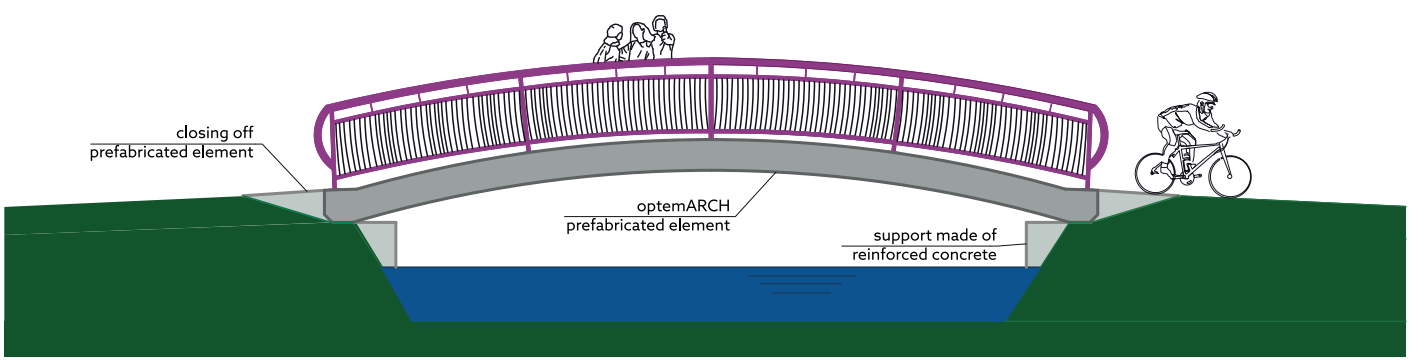
Elements of the optemARCH system
for monolithic supports

Elements of the optemARCH system
for prefabricated supports



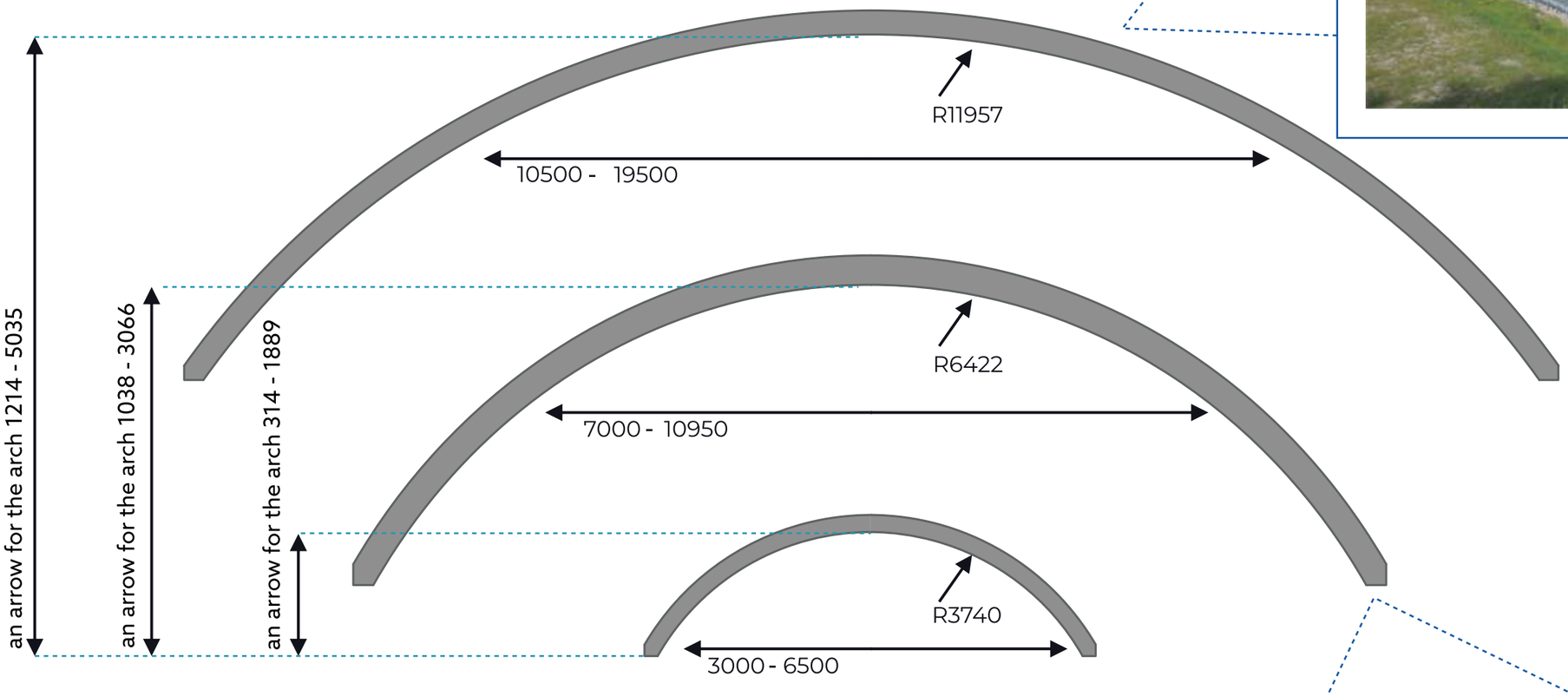

Elements of the optemARCH system
for the arch with a shorter span



## OptemARCH system

Cross-sections of prefabricated elements:




NIDZICA

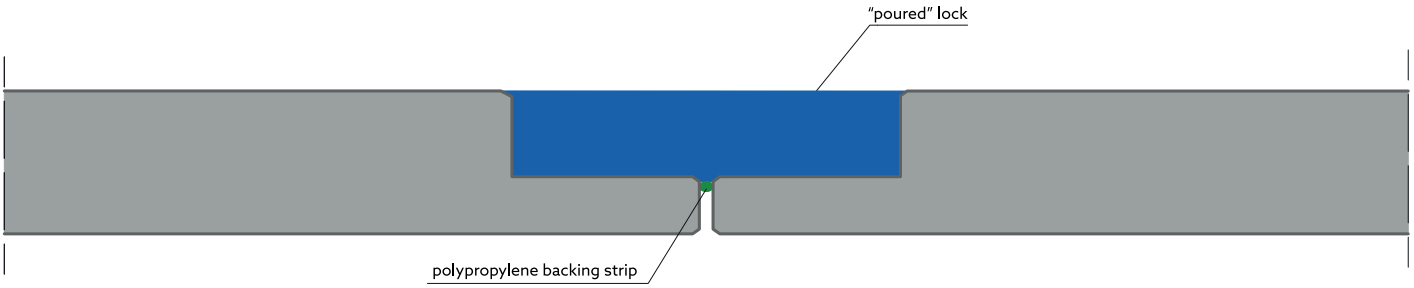
IWIĘCINO

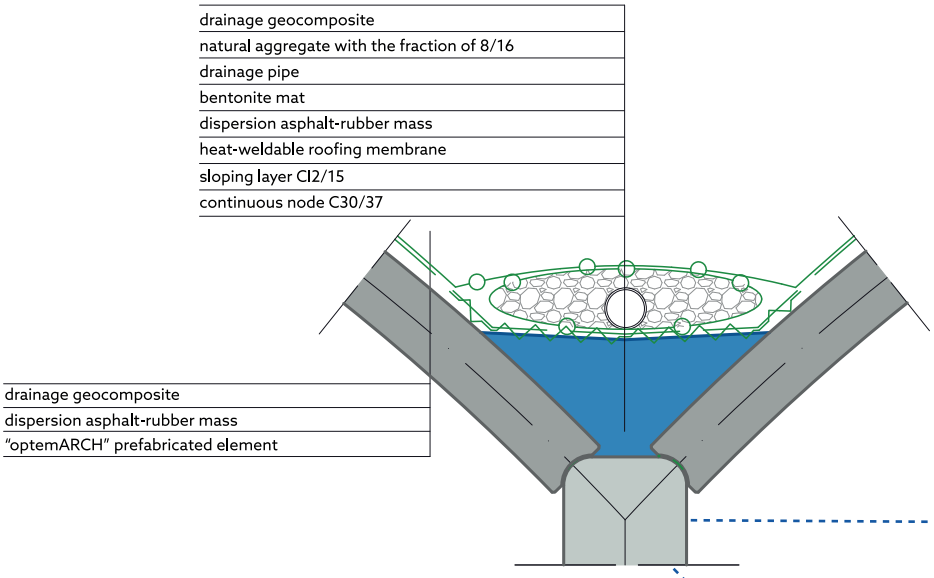
KOŚCIERZYNA

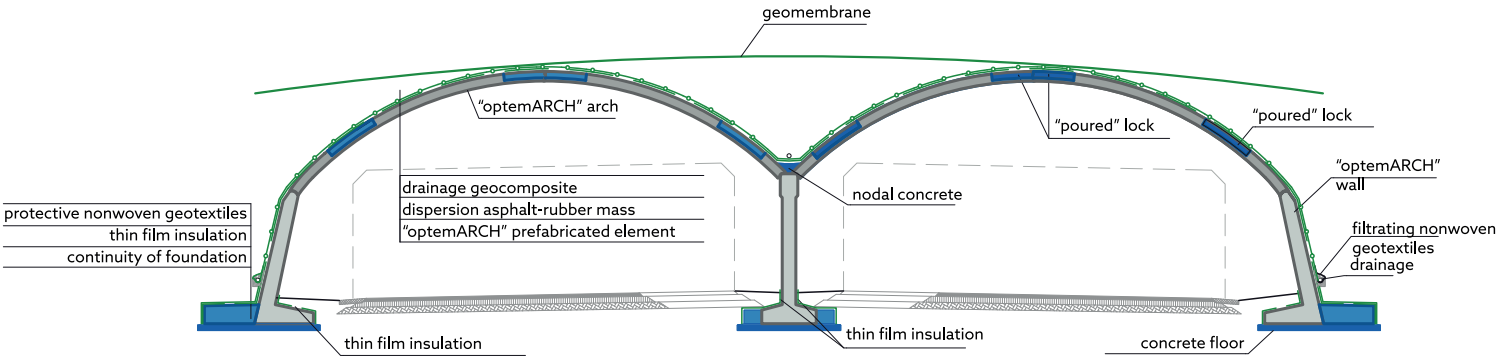
# DURABILITY of optemARCH prefabricated elements

**The durability of structures constructed with the use of optemARCH prefabricated elements is determined by:**

- manufacturing of prefabricated elements in certified plants,
- high quality of concrete that meets contractual demands,
- proper curing of concrete,
- tight water insulation system from the backfilling surface side,
- insulation of the structure with focus on critical points of the structure
- tightness of the connection between prefabricated elements by means of proper protection of contact points, and formation between adjacent segments of a lock filled with concrete.




**The advantages of constructing bridge-type structures with the use of optemARCH prefabricated elements:**

- fast pace of structure completion,
- possibility to optimize the thickness of elements thanks to the use of the arch shape and shell structure,
- low material consumption thanks to uniquely developed system in which individual prefabricated elements interact with each other,
- higher durability of prefabricated structures due to high specifications of the applied concrete
- tightness of the structure thanks to the usage of a tested insulation system,
- the economy of structure maintenance due to the lack of any devices such as bearings, expansion joints, threaded connections.

# INNOVATIVENESS of the optemARCH system

The Optem company together with Road and Bridge Department in Rzeszów University of Technology were conducting a research project: **"Innovative prefabricated arch-shaped elements of increased durability for transport infrastructure engineering"**, which aim was to develop a new **optemARCH** prefabricated arch-shaped element.

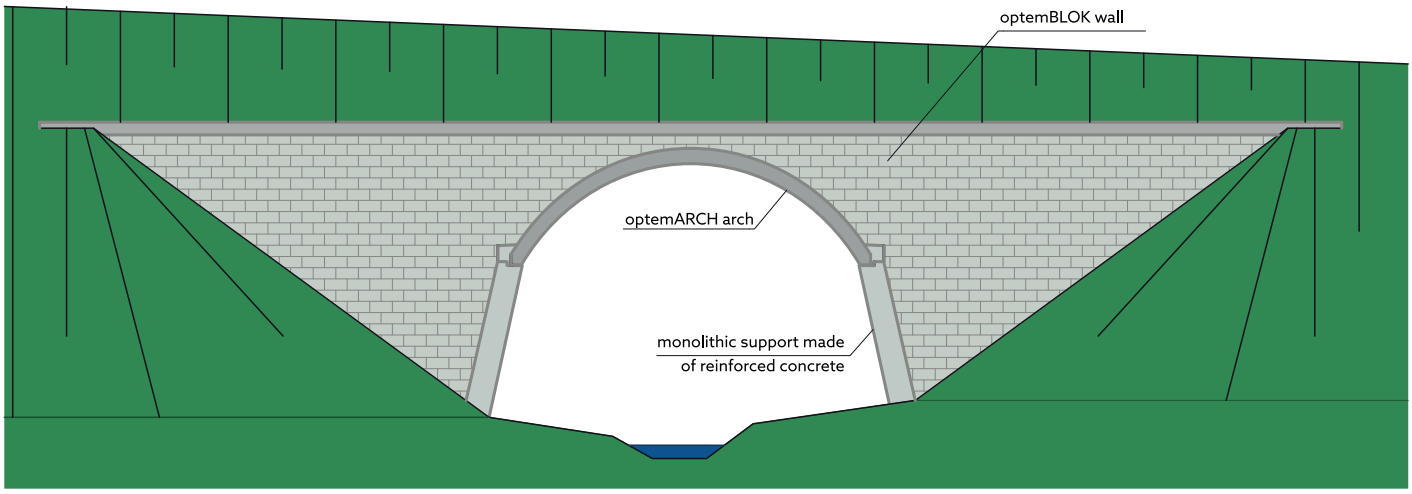
As a part of the project, the research was conducted on the innovative prefabricated element made of lightweight concrete with a composite reinforcement. As a comparison, the research on the traditional prefabricated element made of normal concrete with steel reinforcement was conducted as well. As a result, a significantly improved construction product that was characterized by lower weight and increased corrosion resistance was obtained.


# THE INTERACTION of the optemARCH system with the optemBLOK system

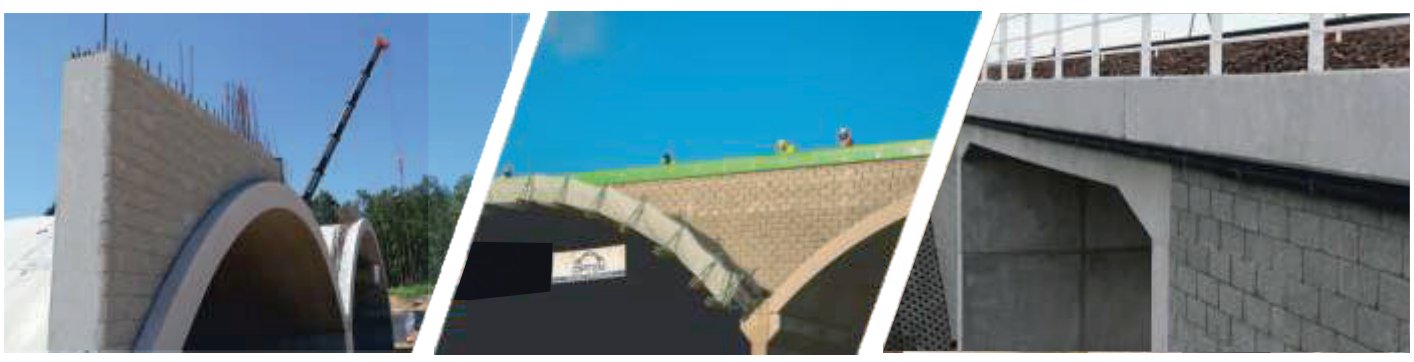
**The optemARCH technology interacts closely with the optemBLOK technology.**

The advantages of using the interaction of both systems:

- the OPTEM company has a wide experience in designing both of the systems. Thanks to using systems of the same company, an engineering structure is treated in a complete and comprehensive way. Issues related to the coordination of businesses are avoided.
- speed of erecting retaining walls in optemBLOK technology in comparison to traditional reinforced-concrete walls,
- the aesthetics of walls made out of prefabricated concrete masonry units.




# THE EXAMPLE OF USING TWO SYSTEMS



## S7
## Nidzica-Napierki stretch of road

**Description of the investment:**

As a part of the investment, a wildlife crossing over the S-7 Expressway and National Road no. 7 was designed. The structure is 98.06 m in length, and 80 m in width. Prefabricated arch-shaped segments were placed on prefabricated system walls.
The total duration of the structure installation that consisted of 285 prefabricated elements was 38 working days.

**Location: Nidzica**

Used products:
**optemARCH**

## The construction of Kościerzyna bypass within the Stargard-Gdynia section of the National Road no. 20

**Description of the investment:**

The PZ-2 wildlife crossing was constructed when performing the Kościerzyna bypass. The structure is 22.57 m in length, while the width of the wildlife crossing is 7 m. The load-bearing structure consists of 9 prefabricated arch-shaped, reinforced-concrete elements based on prefabricated walls of the optemARCH system. The installation of all 27 prefabricated elements lasted 4 days.

**Location: Kościerzyna**

Used products:
**optemARCH, optemFROG**

## Railway no. 20: Warszawa Główna Towarowa – Warszawa Praga

**Description of the investment:**

The crossing below a track system was constructed during repairs on the bypass railway line in Warsaw. Due to the possibility to completely shut off the existing stretch of the railway line, 5 prefabricated arch-shaped, reinforced-concrete elements on monolithic supports were designed

**Location: Warszawa**

Used products:
**optemARCH**

## S-19 Lublin-Rzeszów, Kraśnik-Janów Lubelski stretch of road

**Description of the investment:**

As a part of the investment, seven bridge-type structures were designed and constructed. They ensure the collision-free establishment of the S19 Expressway over obstacles. Every structure is a single-span frame with a prefabricated arch-shaped bolt that is connected with monolithic supports. All structures required the usage of 118 prefabricated elements with a total length of 275 m.

**Location: Janów Lubelski**

Used products:
**optemARCH**

## A1 Tuszyn, C stretch of road Kamieńsk junction (without a junction) Radomsko junction (with a junction)

**Description of the investment:**

As a part of the investment, the engineering structure was designed and constructed for the purpose of collision-free migration of large animals over the A1 Motorway. The wildlife crossing was designed as a four-span structure of prefabricated arches based on reinforced-concrete walls. On the entrance and exit of the structure, reinforced-concrete retaining walls with the optemBLOK small-size concrete masonry units siding were designed. The structure was constructed in a so-called partial-closure technology due to the necessity of maintaining traffic on the existing road.

**Location: Janów Lubelski**

Used products:
**optemARCH, optemBLOK**

# OPTEM consists of:

**DESIGN OFFICE**

- **bridge** studio
- **building** studio
- **geotechnics** studio
- **road** studio

**THE DEPARTMENT OF INVESTMENT PERFORMANCE**

- the construction of prefabricated bridge-type structures: **optemARCH**, **optemFRAME** and **optemPLATE**
- the construction of **optem BLOK** retaining walls
- the construction of engineering structures
- the construction of building structures

OPTEM

**THE DEPARTMENT OF TECHNOLOGY**

- **optemARCH** – the system of prefabricated bridge-type structures
- **optemFRAME** – the system of prefabricated reinforced-concrete frames
- **optem PLATE** – the system of soil-shell structures in corrugated sheet technology
- **optem BLOK** – the system of retaining walls made of reinforced soil with small-size concrete masonry units siding
- **optemFROC** - the system of prefabricated guiding fences

## ONE COMPANY – A NUMBER OF SOLUTIONS

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**Optem**
ul. Grota-Roweckiego 12
80-108 Gdańsk
Tel. (+48) 58 346-40-40
biuro@optem.pl
www.optem.pl