



VIACON ACADEMY

WEBINAR SERIES - AUTUMN 2021

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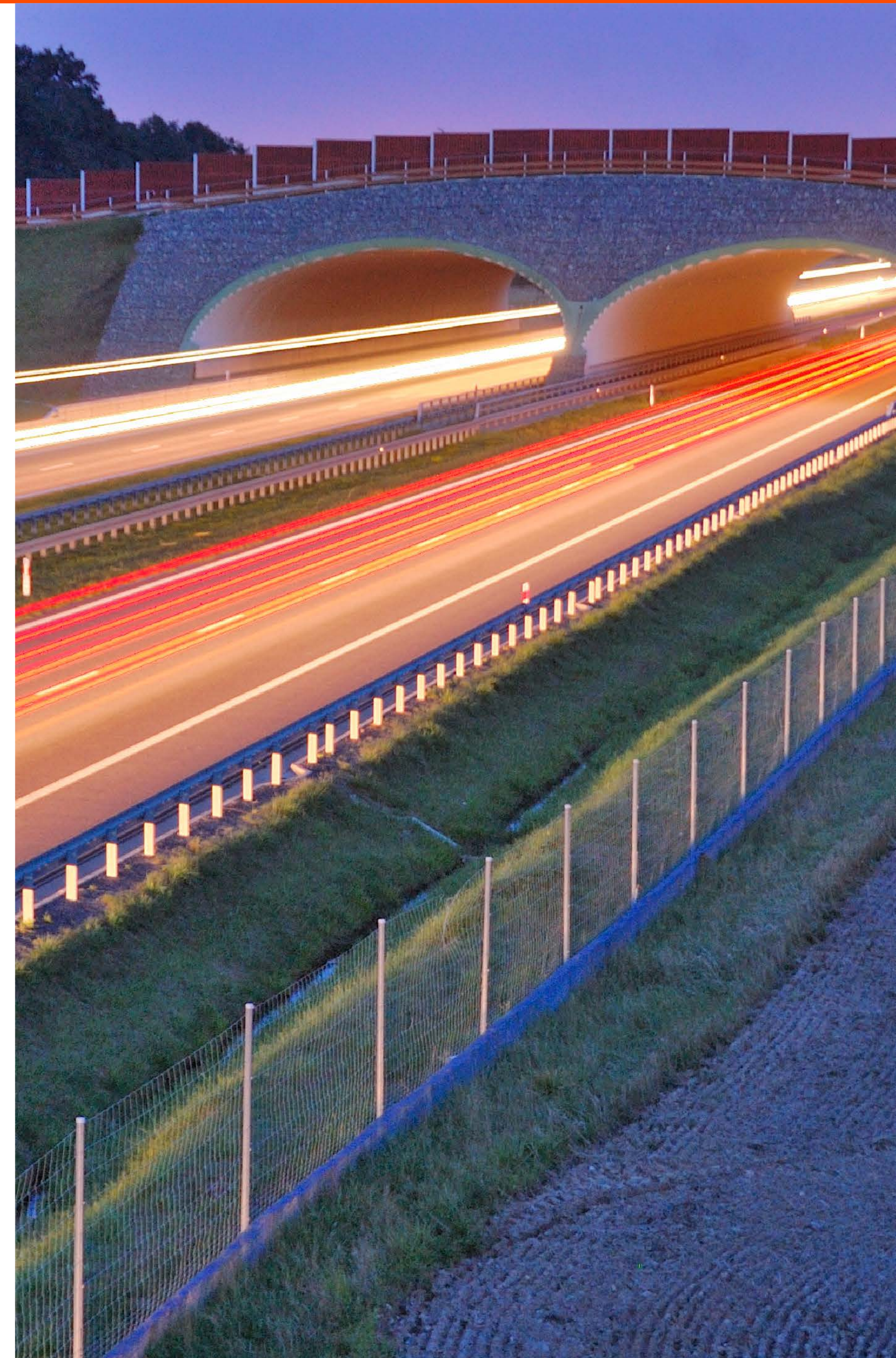
Constructing connections.
Consciously.

ViaCon Group

The ViaCon Group is an international provider of state-of-the-art innovative engineering solutions to build:

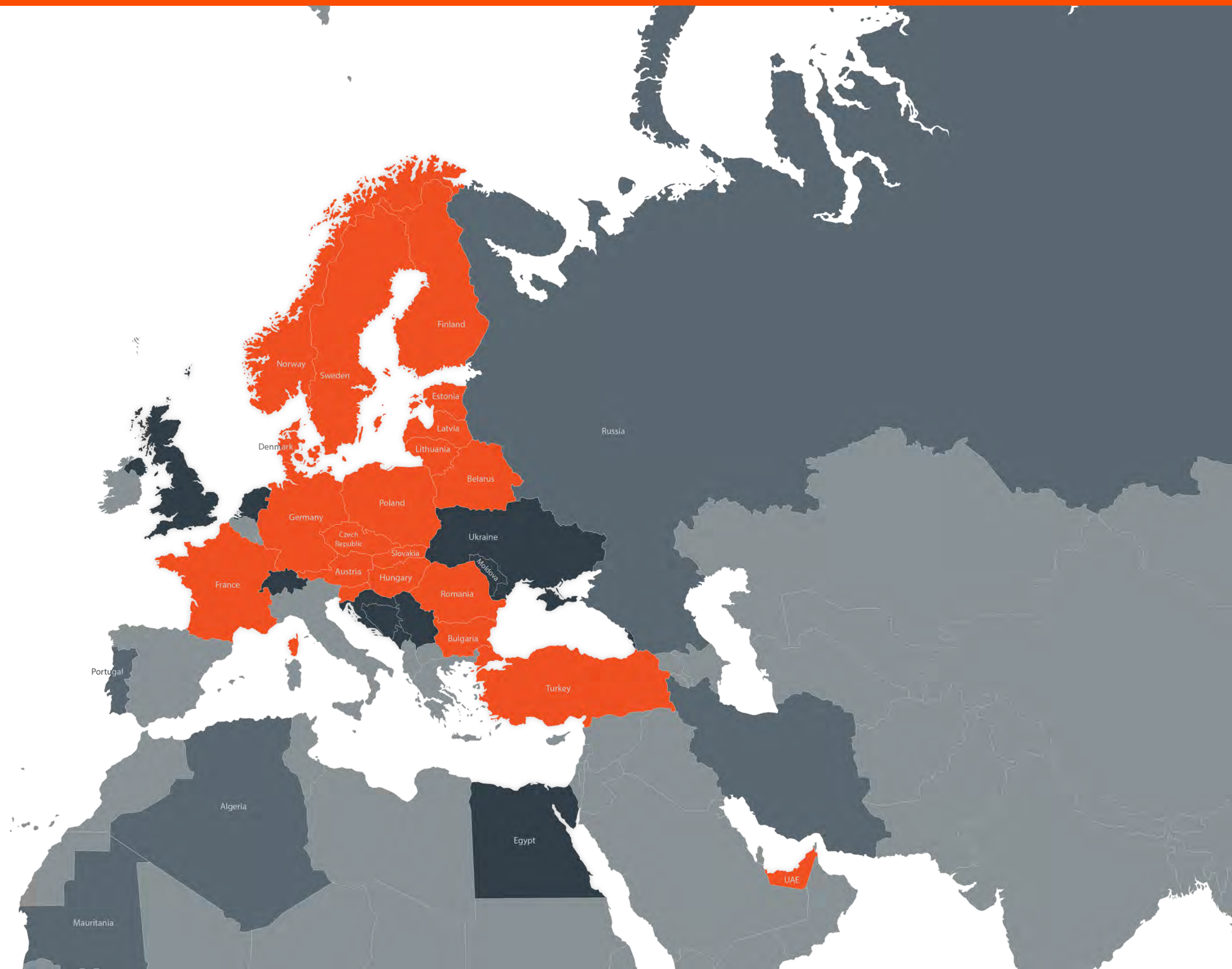
- culverts,
- bridges,
- grade separations,
- wild and rural crossings,
- tunnels etc.,

in addition to GeoTechnical and StormWater Solutions, using our corrugated steel and plastic pipes, as well as corrugated steel structures.



ViaCon's Geography

- ViaCon Member
- ViaCon Partner
- ViaCon Project



ViaCon's Solution Offerings



With more than 30 years of civil engineering experience, we provide specialized, world-class **Bridges and Culverts** solutions that are **strong** and **durable**, **cost-efficient**, and **sustainable**.



Our state-of-the-art **Geotechnical solutions** and products help solve all issues in the field of geotechnical engineering. Our solutions range from **soil reinforcement** to **landfills** and **much more**.



With our outstanding technical and engineering prowess, ViaCon's **StormWater solutions** and products are designed to meet the challenges of stormwater management, ranging from **storing stormwater** to **infiltration** and **drainage**, to treating polluted **wastewater**.

Applicable Industries

We focus on constructing diverse solutions that match the needs of our customers and contribute to meeting the challenges of our changing world.

ViaCon's solutions are used by the following industries:



ROADS



RAILWAYS



FORESTRY



COASTAL AND
WATERWAY ENGINEERING



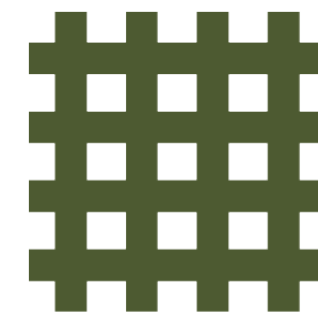
MINING



AGRICULTURE



ENVIRONMENT



MILITARY



BUILDING AND
INDUSTRIAL AREAS



AIRPORT

An aerial photograph of a snowy landscape. A road with two lanes runs vertically through the center. On either side of the road, there are clusters of evergreen trees. The snow is bright white, and the trees are dark green. The overall scene is serene and well-maintained.

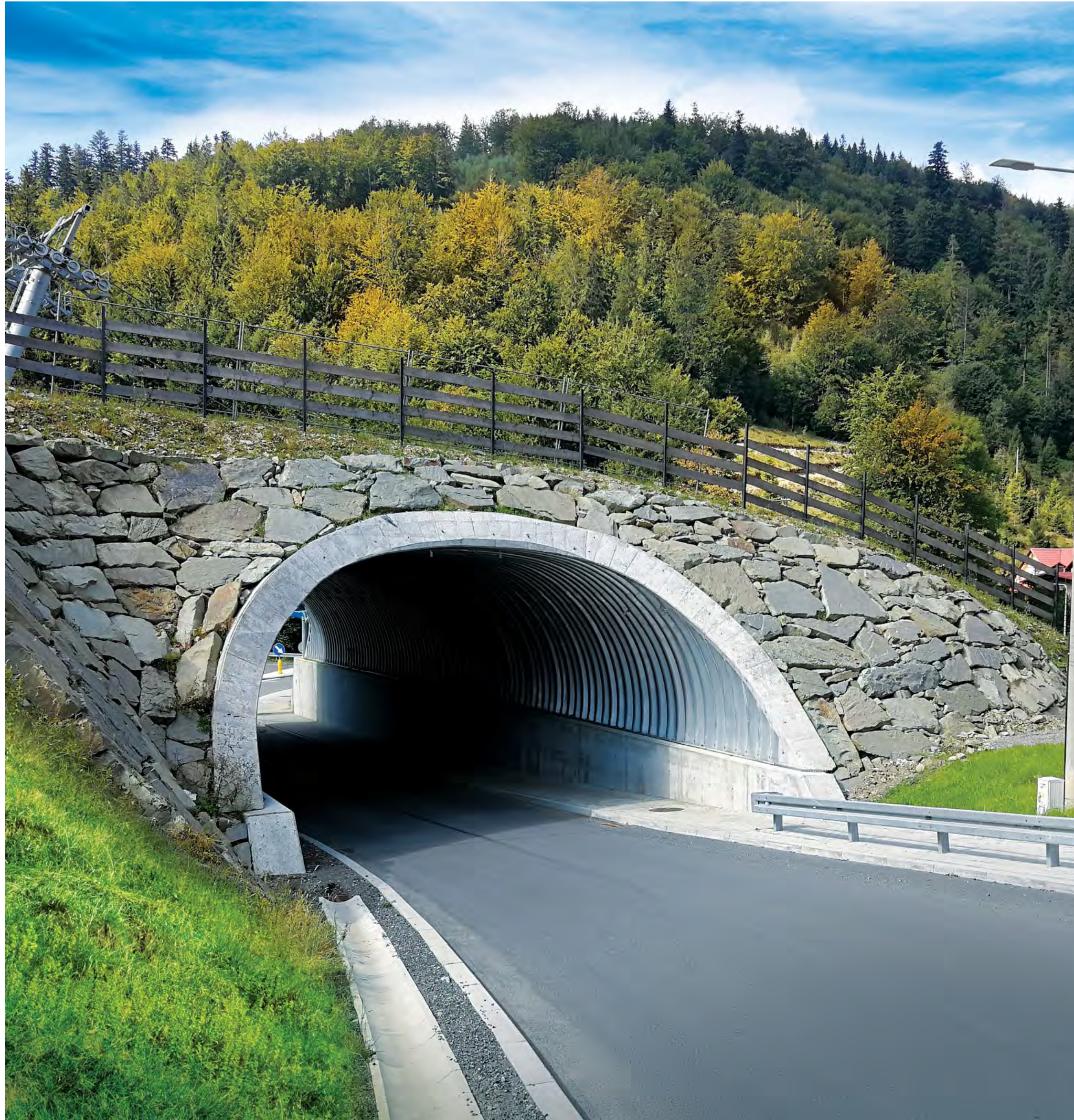
Aesthetic Arrangement in Landscape Architecture

Aida Balaš, Piotr Tomala, Yonko Dobrev

13-th October 2021

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Introduction

A **landscape** is where we all make our homes, do our work, live our lives, dream our dreams.

Landscape aesthetic value is considered to contribute to quality of life by providing inspiration, harmony, and peace.

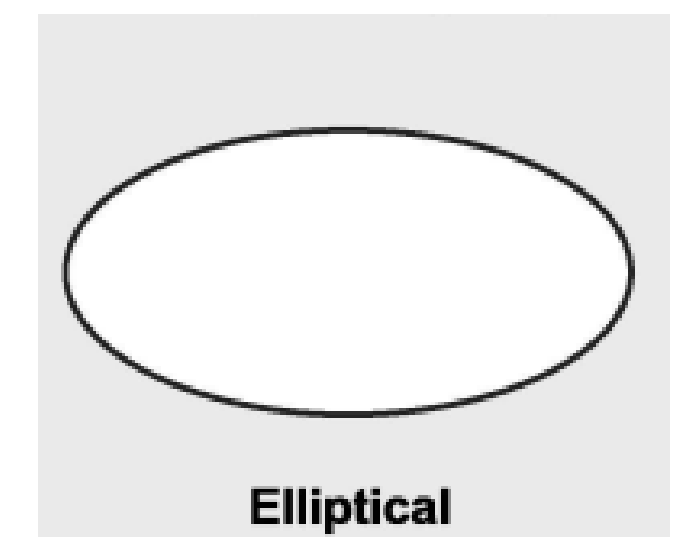
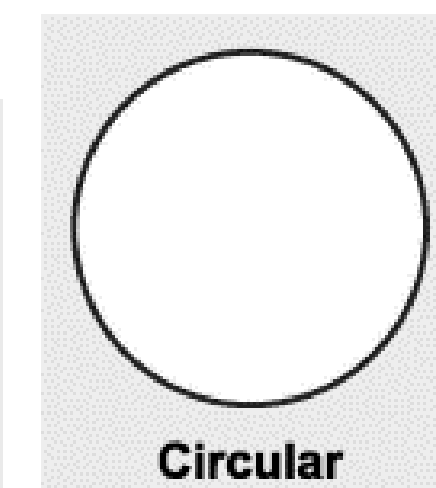
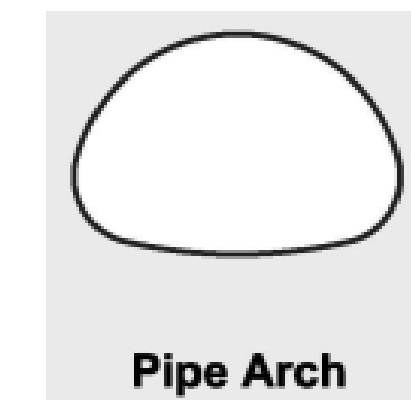
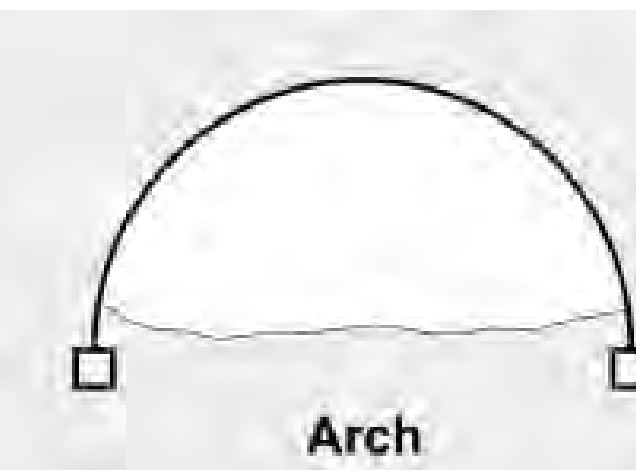
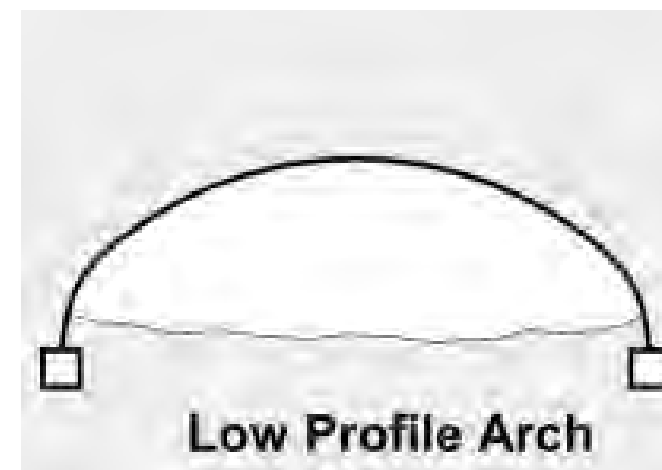
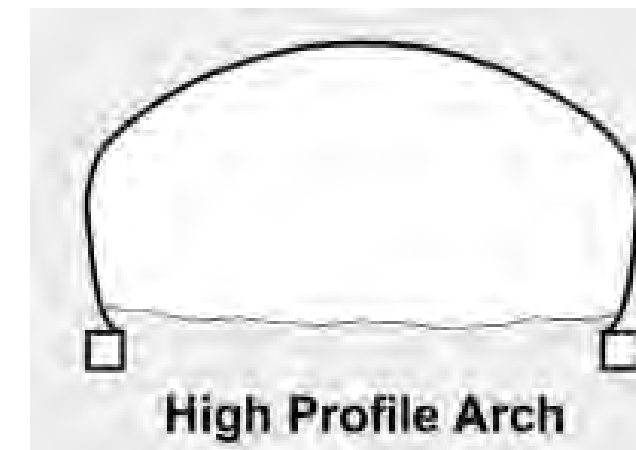
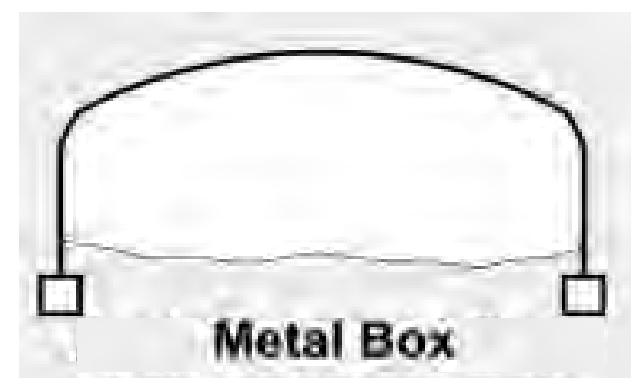
Landscape aesthetics is defined as the enjoyment and pleasure felt through the observation of environmental scenery.

What does **ViaCon** do?

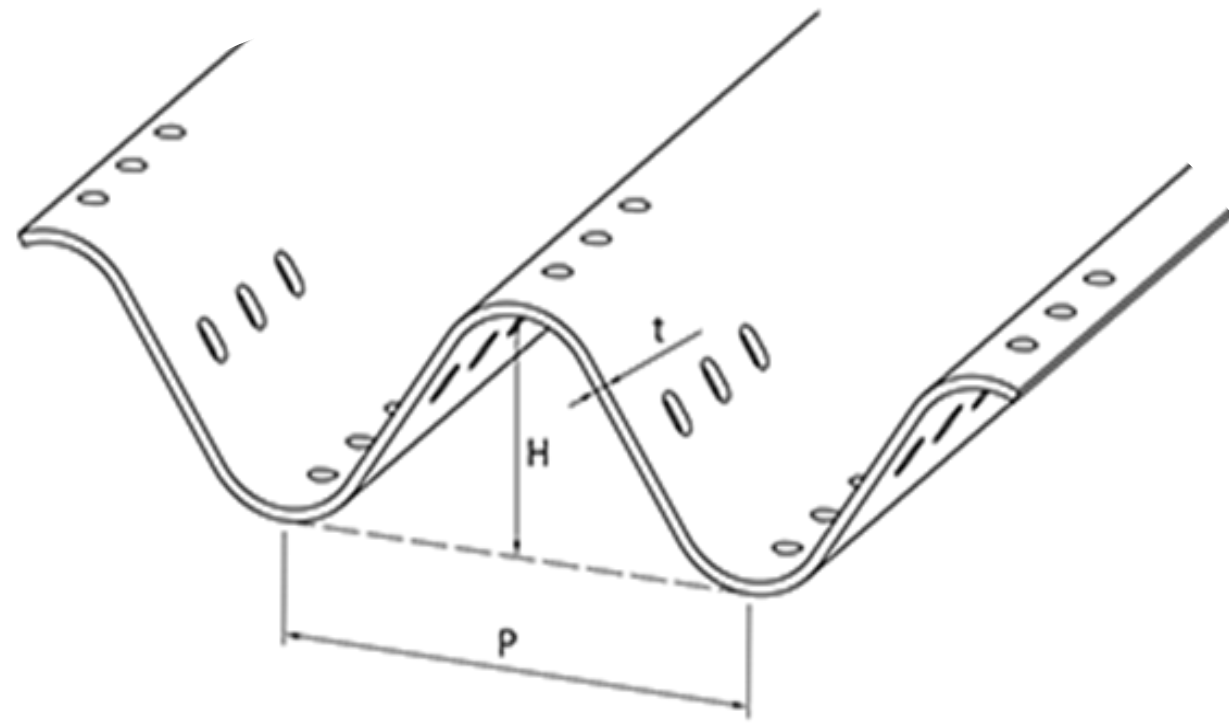
- Various shapes
- Wide range of spans



Photographs: <https://www.viacon-hamco.de>



Corrugation



As a texture rule, the larger the object, the larger the texture should be.



MultiPlate
200x55 [mm]

Open-shape profiles:
Spans up to 12 m

Closed-shape profiles:
Spans up to 12 m



SuperCor
381x140 [mm]

Open-shape profiles:
Spans up to 25 m

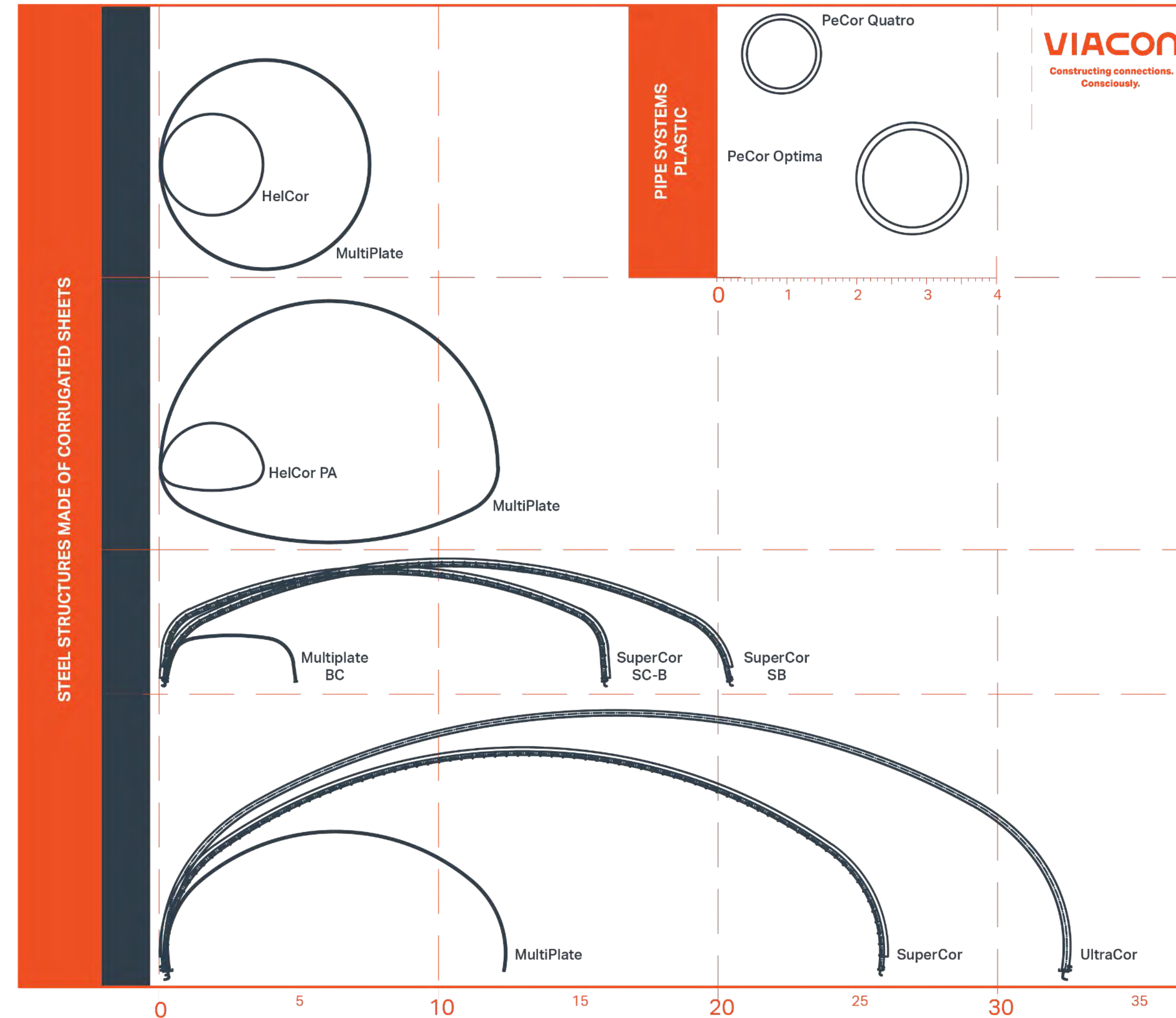
Closed-shape profiles:
Spans up to 16 m



UltraCor
500x237 [mm]

Open-shape profiles:
Spans over 30 m

What does **ViaCon** do?



About Bridges

- Why do people build bridges?
- Structures or symbols?
- What is the role of Engineers, Architects, and Builders?



.... and their History

The Caravan Bridge, a single-arch stone structure in Turkey built around 850 BC, is considered the oldest bridge that is still functioning.



... and Aesthetics

Until the early 19th Century there were no structural bridge engineers and architects. These professions and “titles” simply did not exist at that time. Writers and scholars often refer to architects when describing ancient constructions; however, these “*chief builders*” practiced the combined tasks of present-day engineers, architects, artists and craftsmen.

When discussing bridges, important issues to consider are aesthetics and the respective roles of engineers, architects, and builders in designing a bridge. What makes a bridge structure elegant and appealing?



When Designing Bridges...

- Function
- Form
- Bearing capacity
- Deflections
- Technology
-
- Aesthetics



Possible Functions

- **Bridges**
- Grade separations
- Underpasses
- Culverts
- Military structures
- Industrial equipment (mining entrance covers, conveyor tunnels etc.)



Possible Functions

- Bridges
- **Grade separations**
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Possible Functions

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Possible Functions

- Bridges
- Grade separations
- Underpasses
- Culverts
- Military structures
- **Industrial equipment (mining entrance covers, conveyor tunnels etc.)**



Applications

When the terrain is limited by:

- Buildings
- Other structures
- Road lane boundary

When a structure has got extraordinary span and rise and its length is relatively short:

- Square ends



Applications

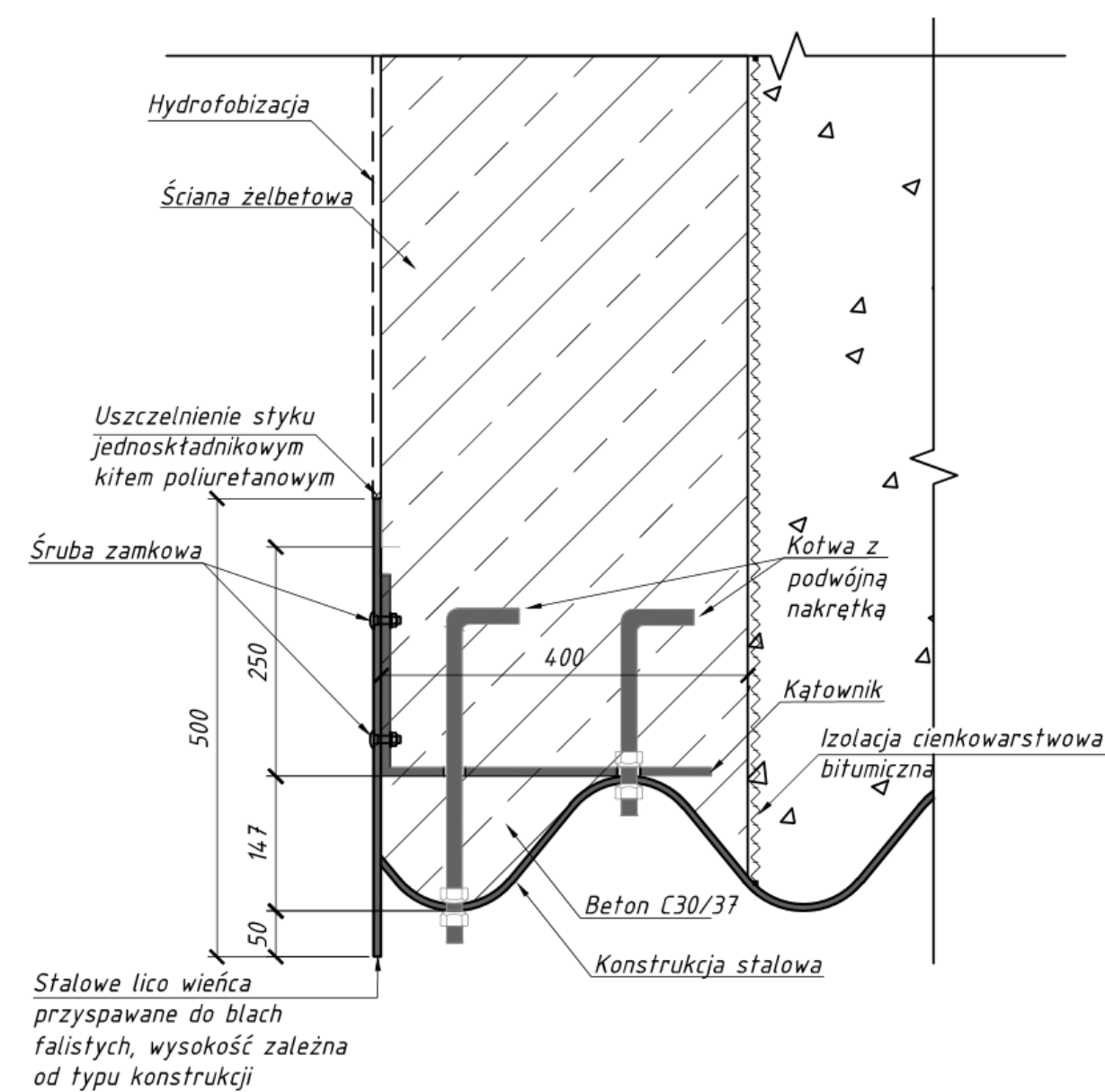
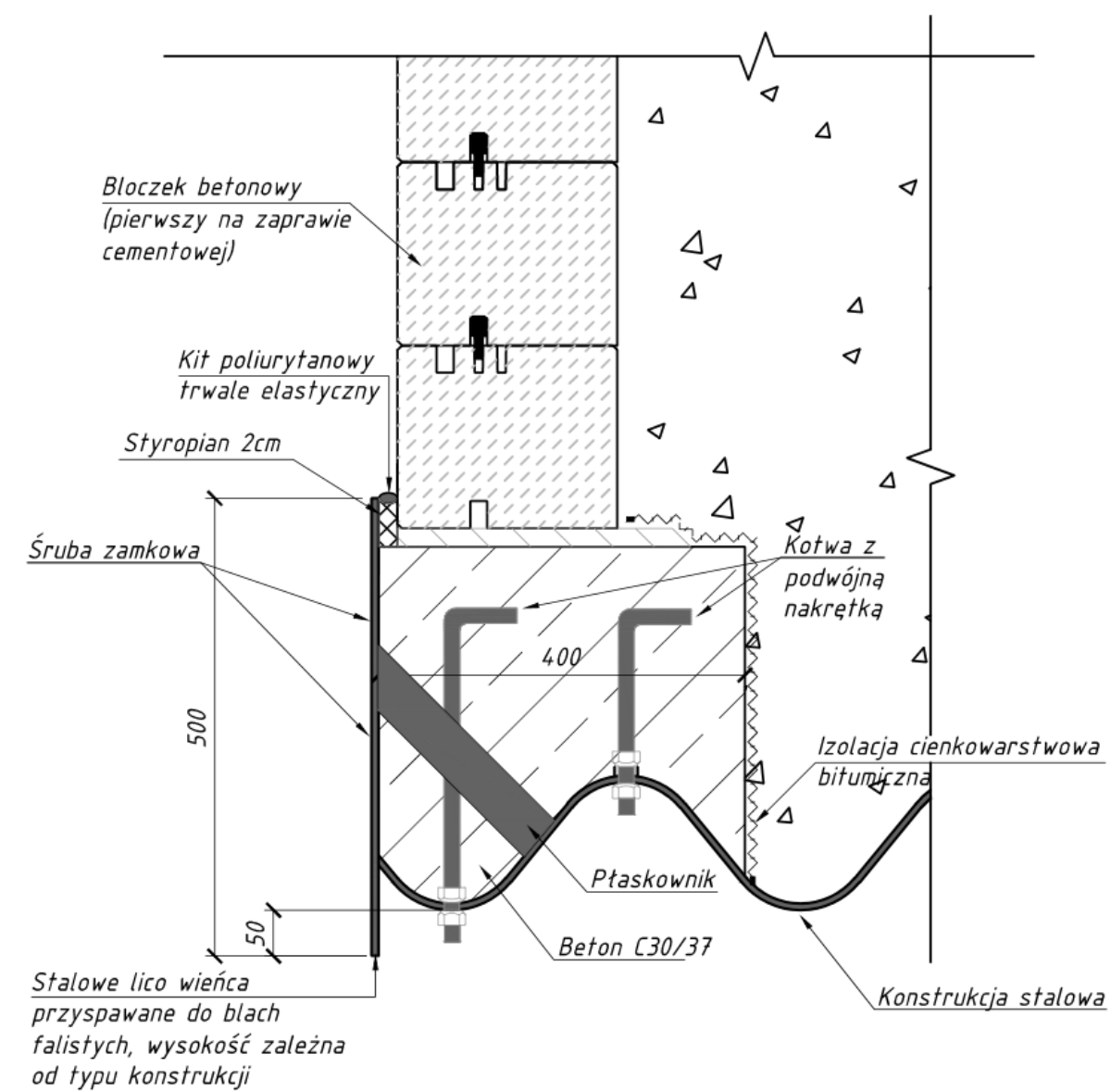
When there is no limitation of terrain:

- structures with bevelled ends



End Treatment

- Square
- Bevelled



To expose or to blend in ?

- Natural environment
- Landmarks



To expose or to blend in?

- Natural environment
- Landmarks



To expose or to blend in ?

- Natural environment
- Landmarks



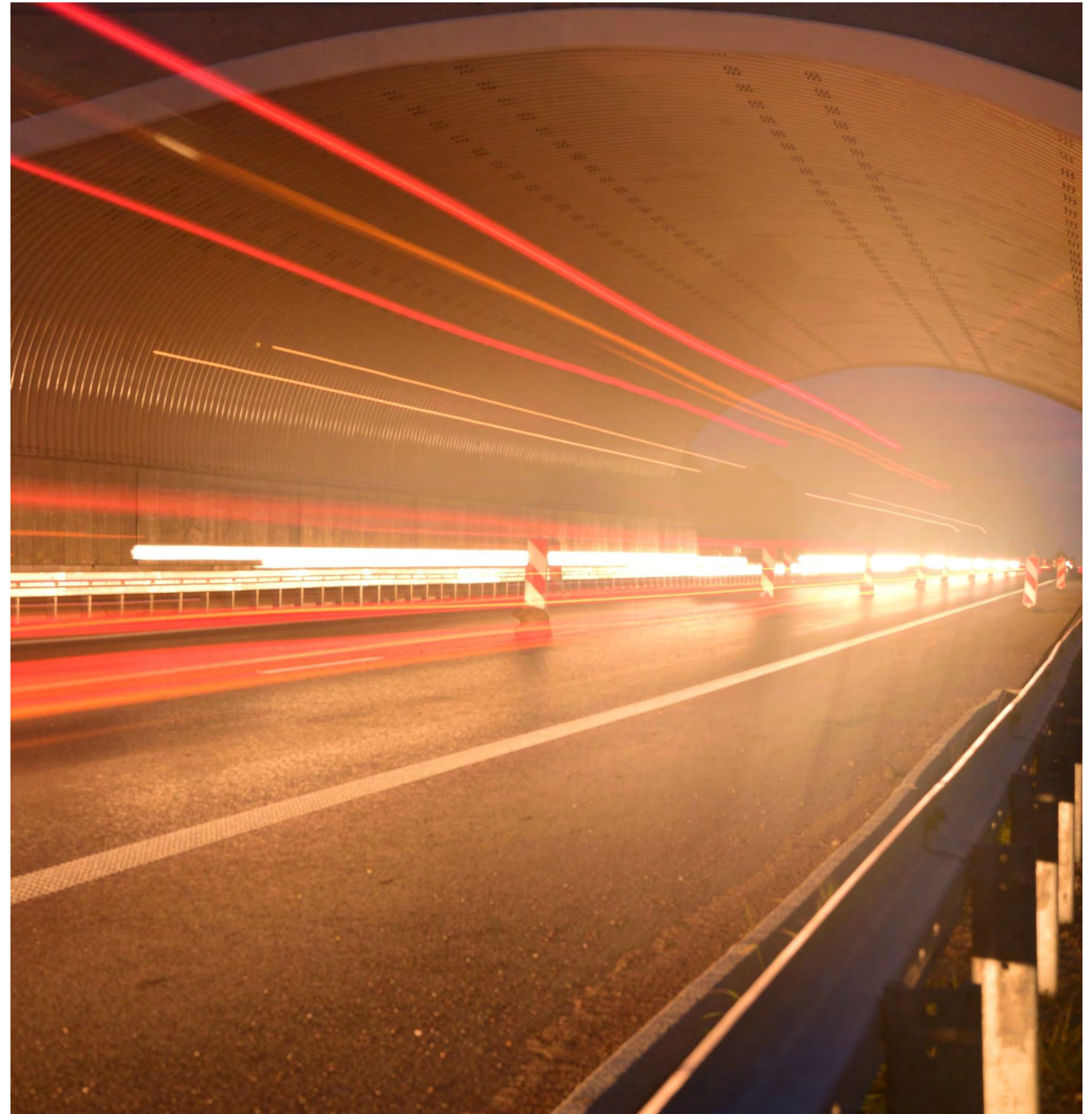
To expose or to blend in?

- Natural environment
- Landmarks



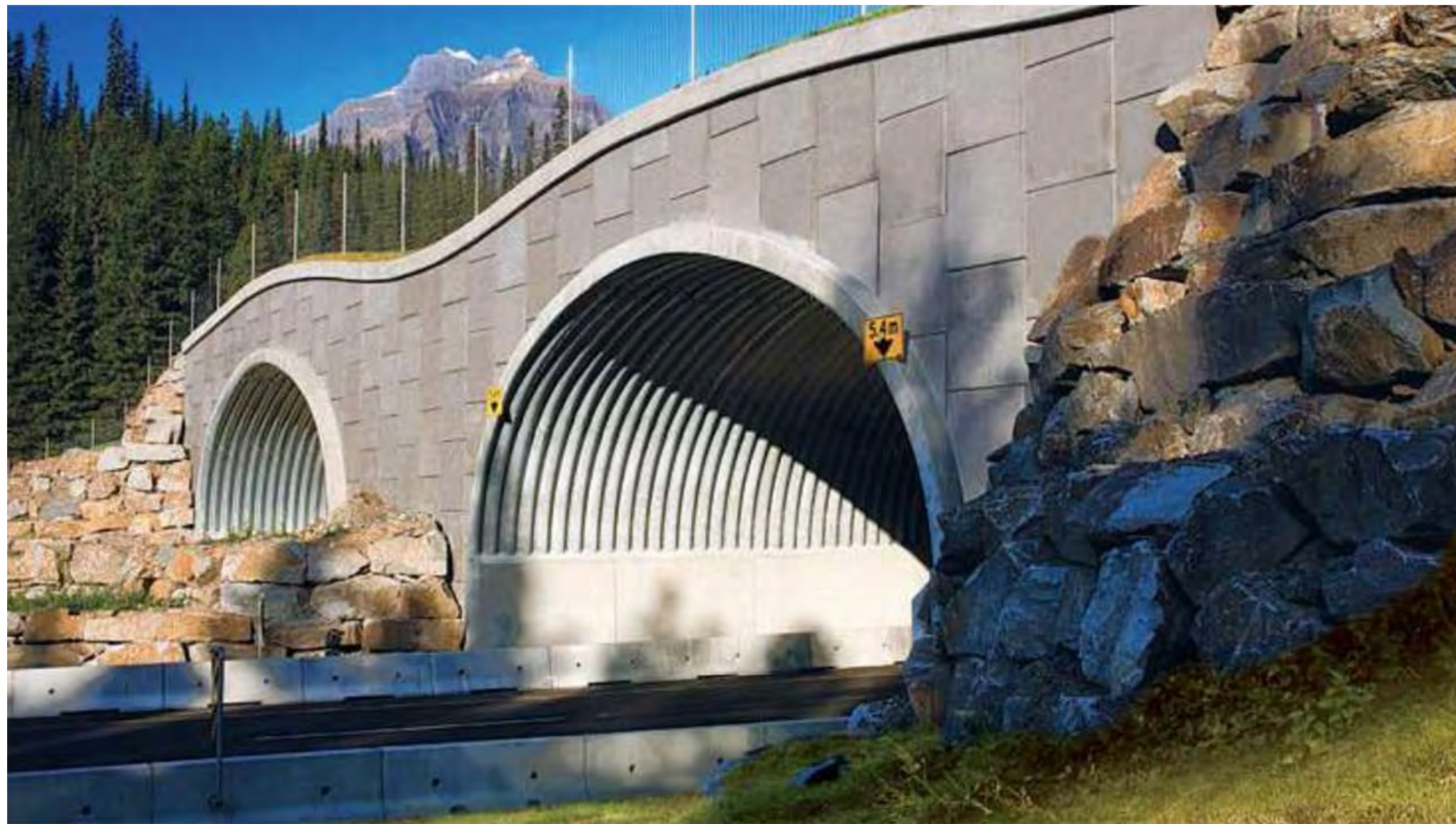
To expose or to blend in?

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To expose or to blend in?

- Natural environment
- Landmarks



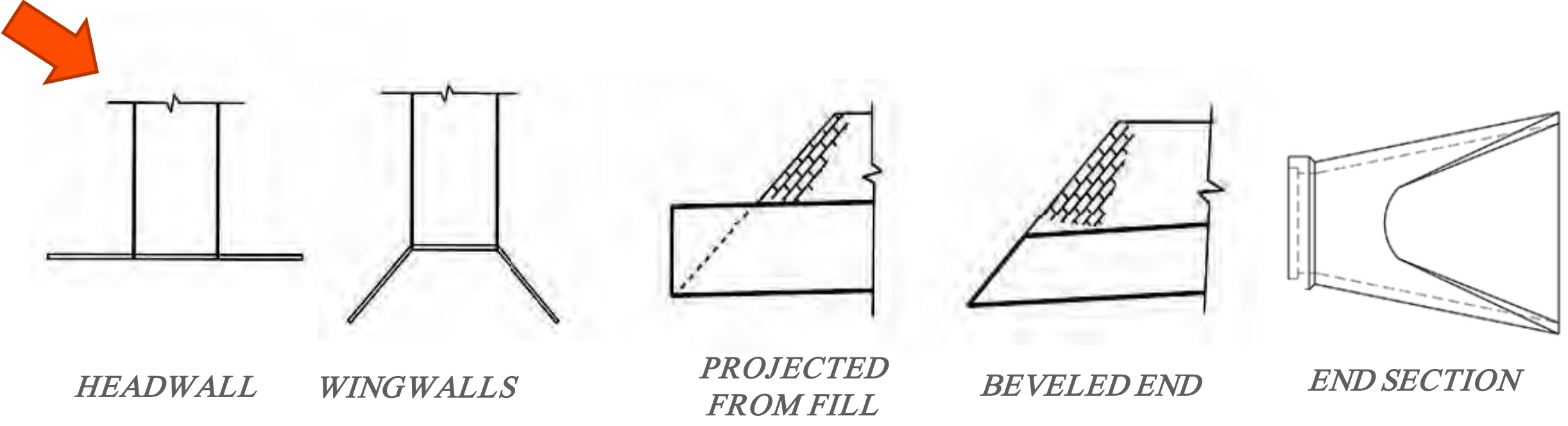


Aesthetics and Function

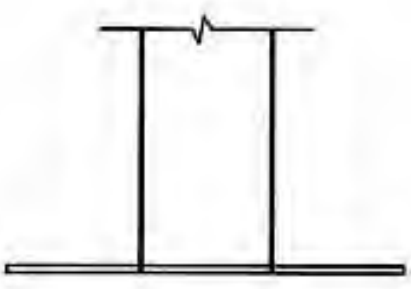
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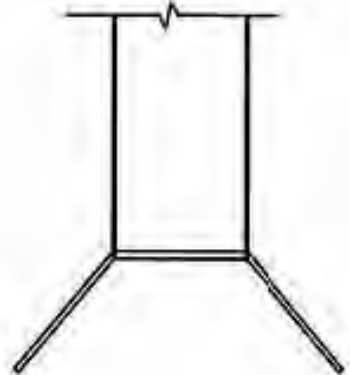
Let it flow...



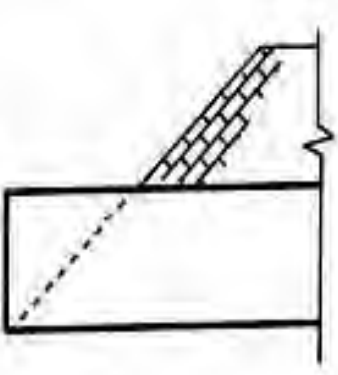
Let it flow...



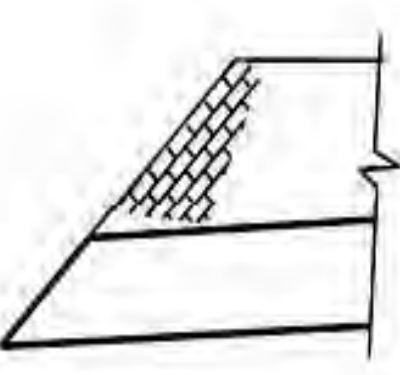
HEADWALL



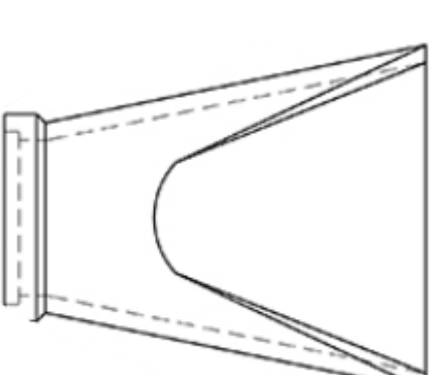
WINGWALLS



PROJECTED FROM FILL



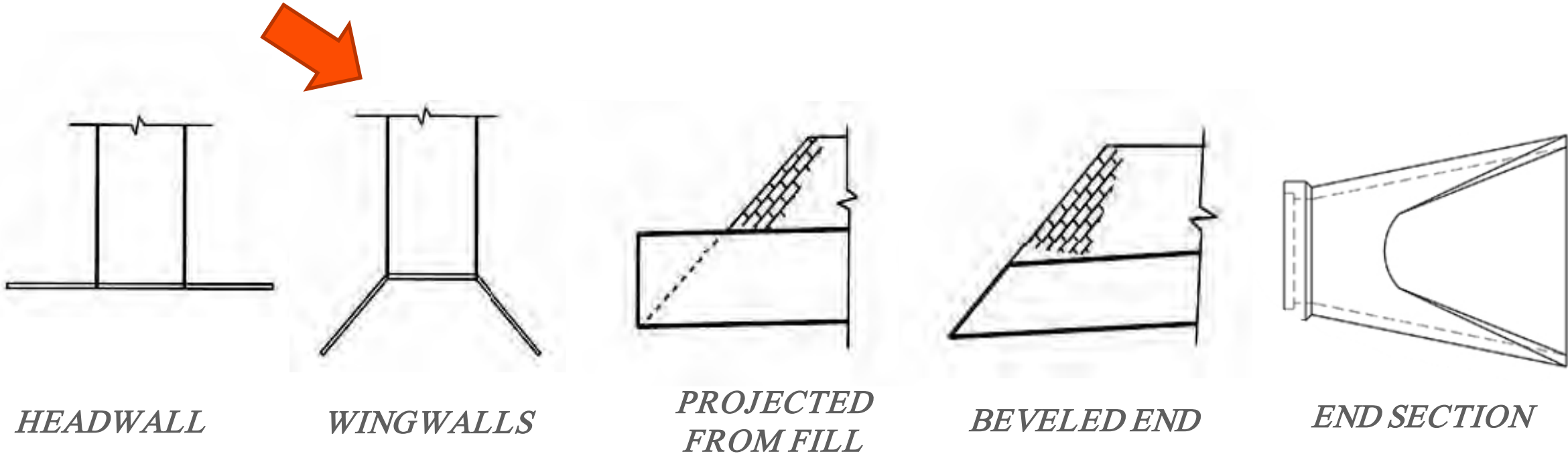
BEVELED END



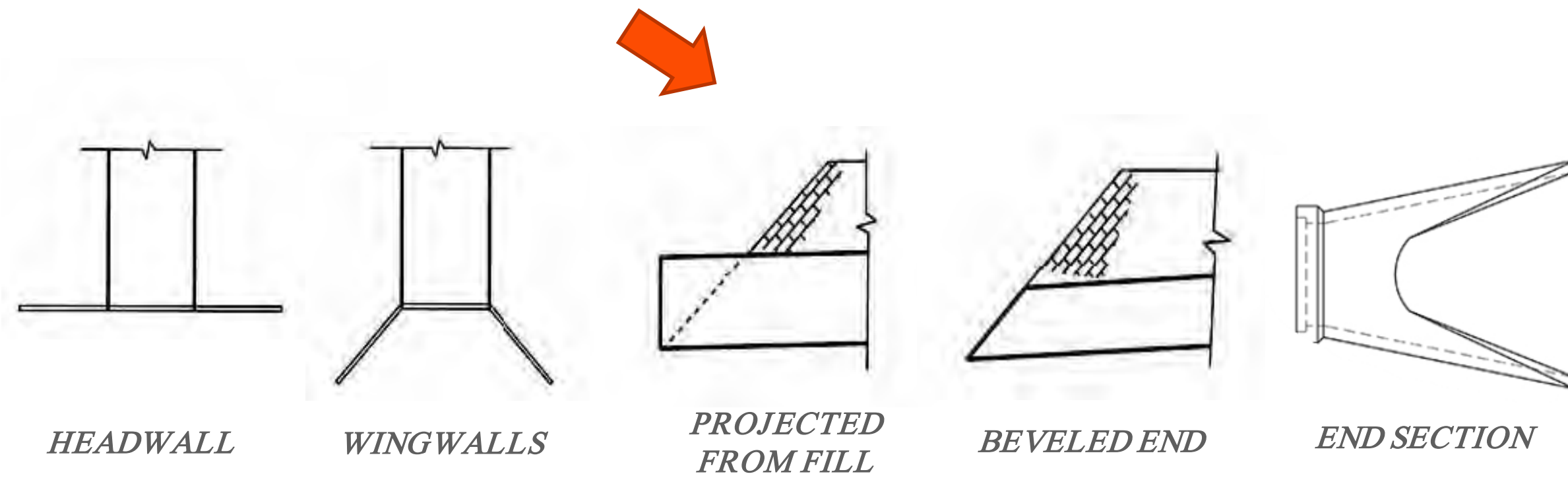
END SECTION



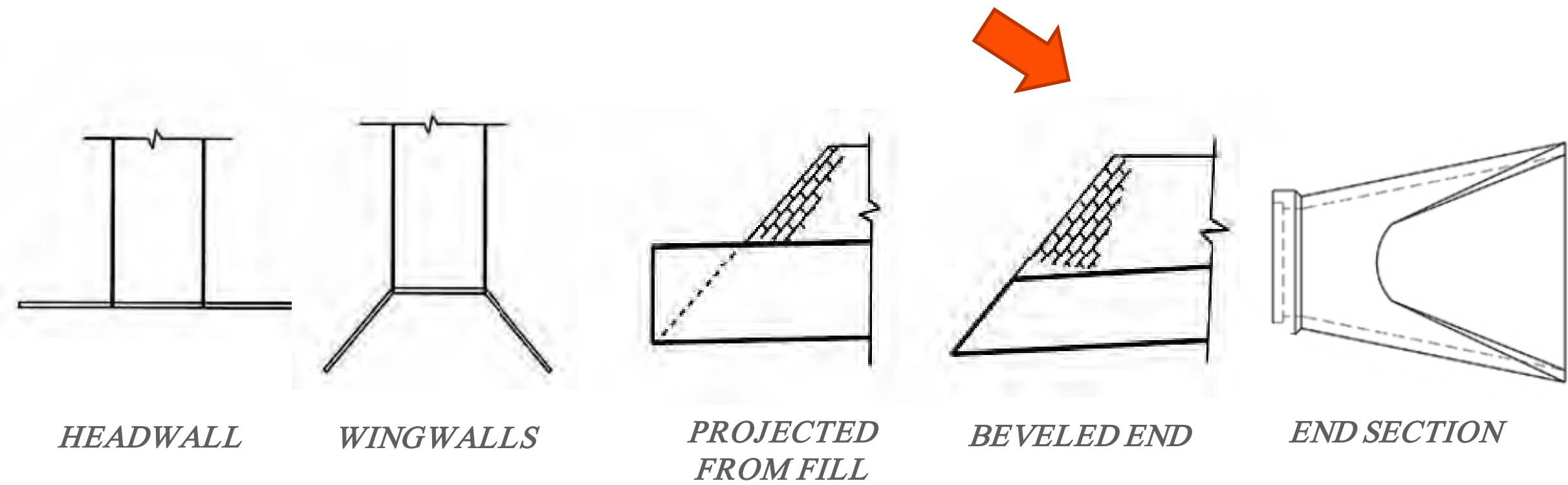
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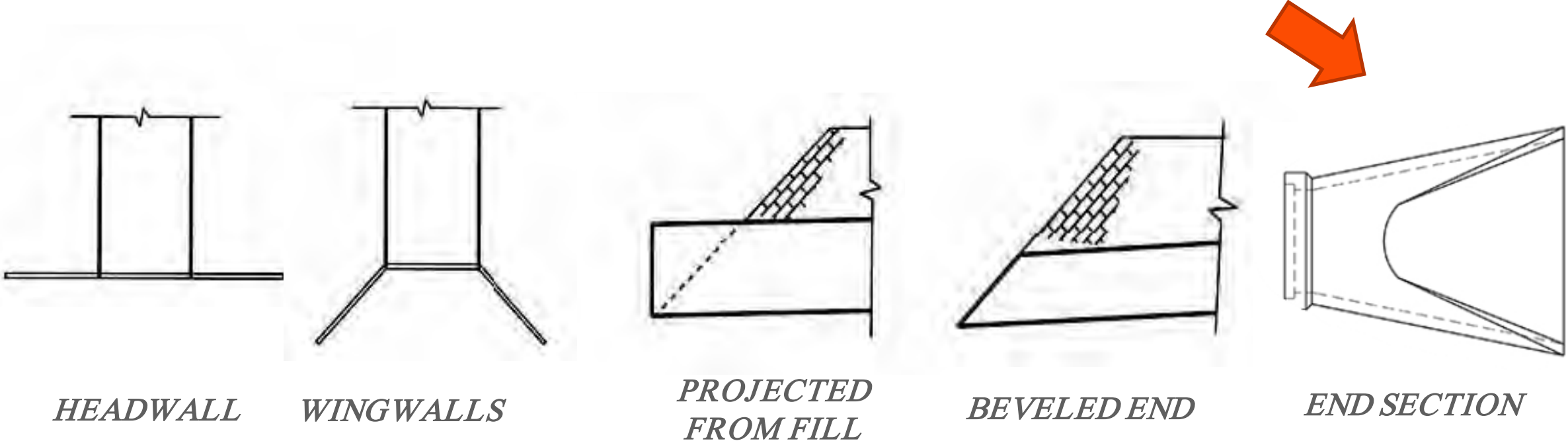
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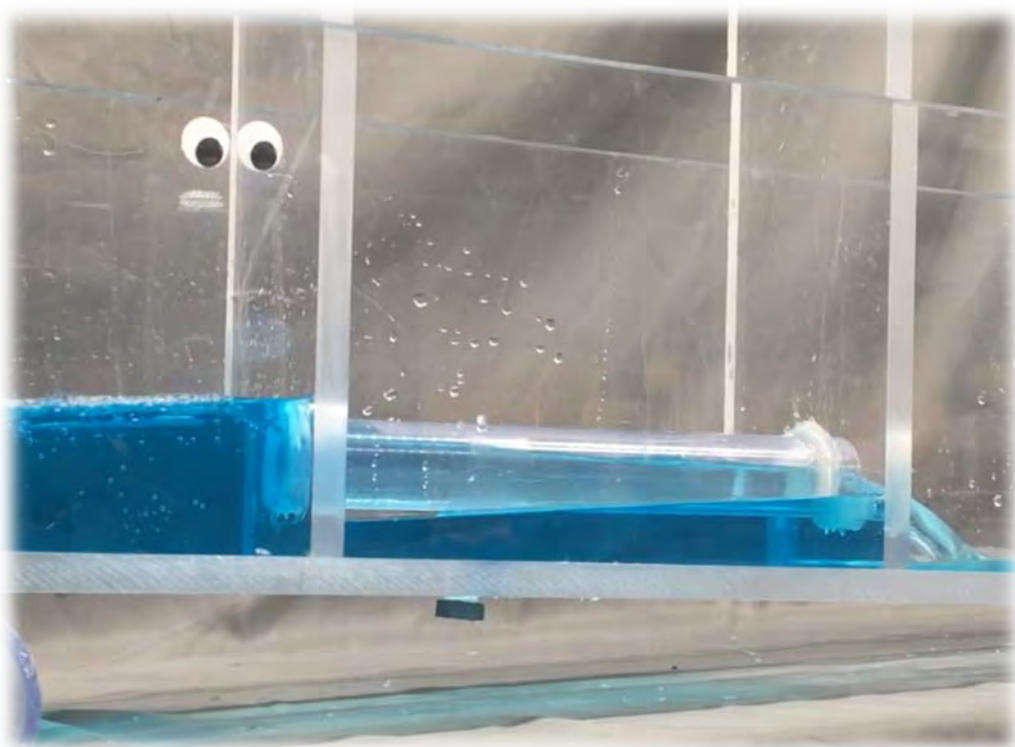
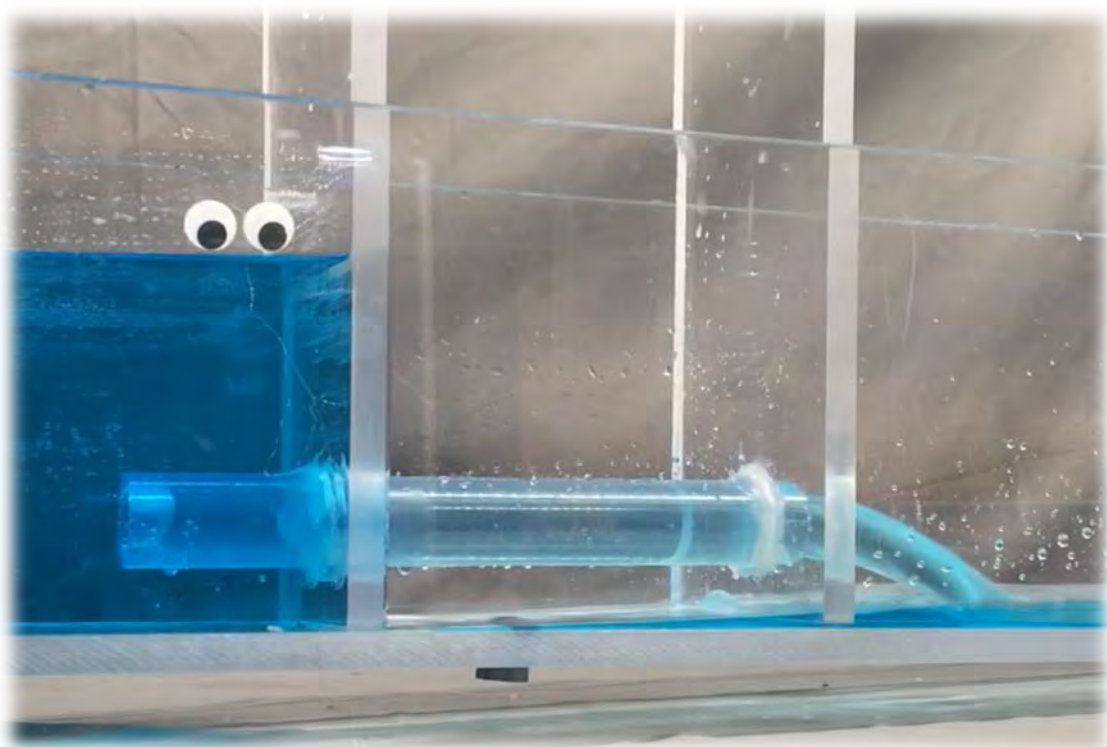
Let it flow...



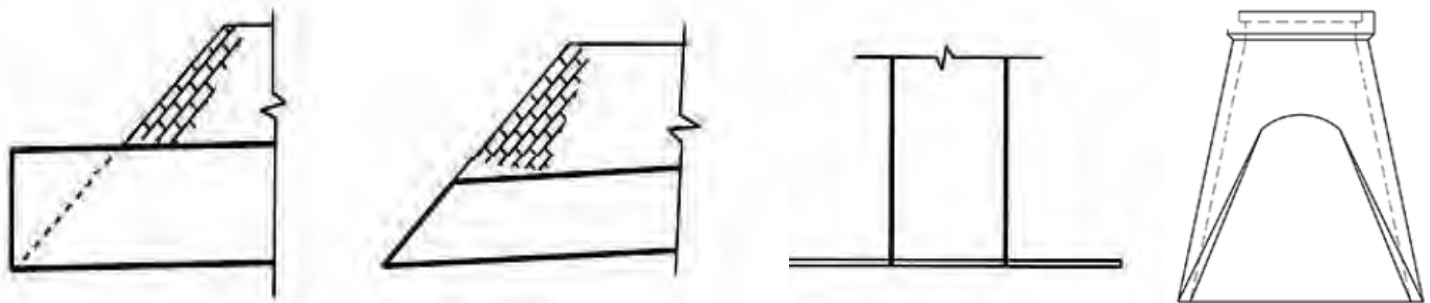
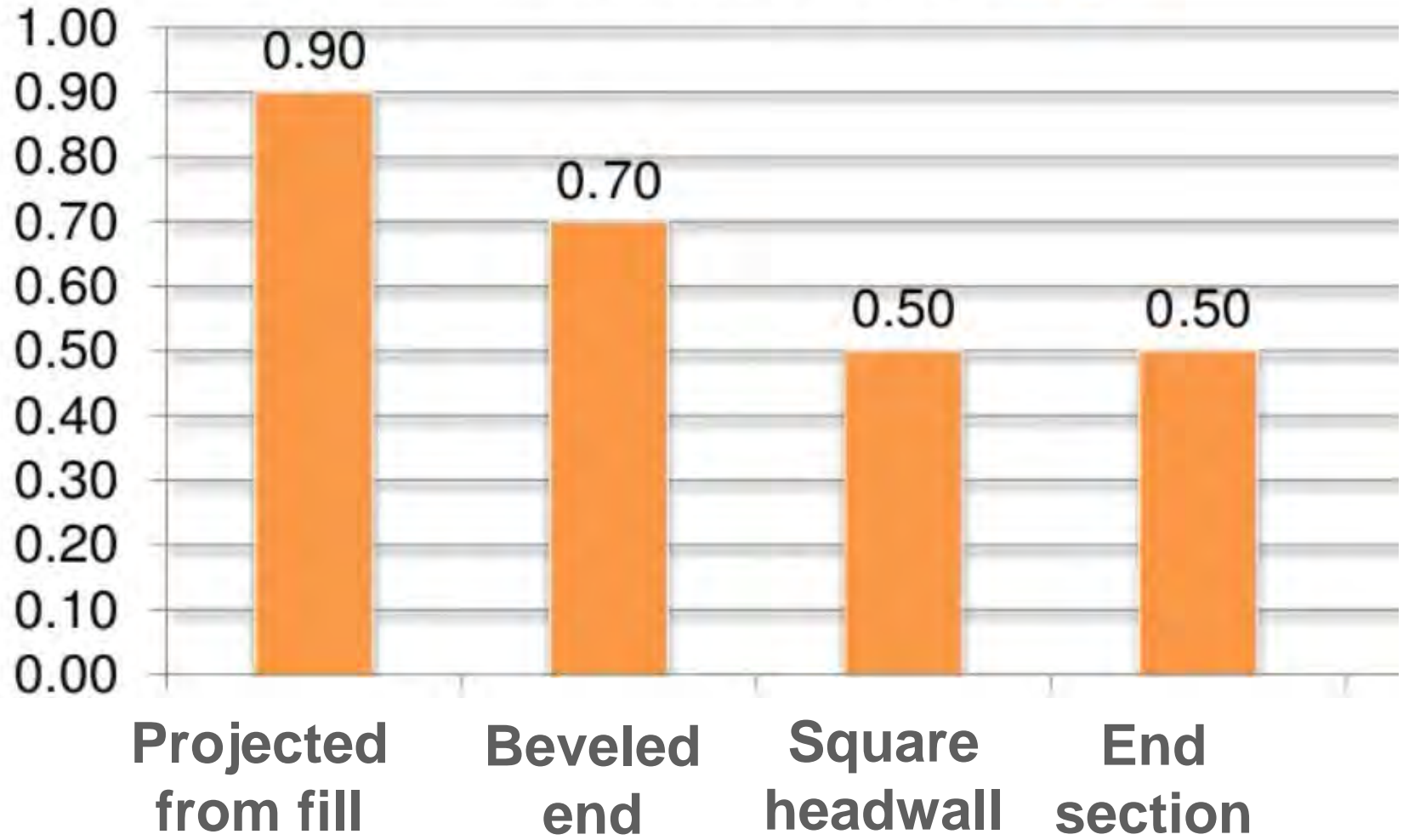
Let it flow...



Let it flow...



Entrance Loss k_e



Let it flow...







Aesthetic Arrangement in Landscape Architecture

Bridges & Culverts applications in
urban environments

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Urban Landscape Concept



Artistic Approach

- Aesthetics (objective)
- Function

Urban View



Functional Approach

- Aesthetics (objective)
- Function

Spatial Structure



Perceptual/Contextual Approach

- Aesthetics (objective)
- Function
- Identity
Meaning
Culture
History

Socio-Spatial Structure



Sustainable Approach

- Aesthetics (objective)
- Function
- Identity
Meaning
Culture
History
- Ecology

Sustainable Socio –
Spatial Structure

Artistic Approach

- Aesthetics (objective)
- Function



Landscape Patterns



Arch Shape



Corrugation



Ending Treatments

Arch Shape

Arch shape, clearly expresses its ability to carry loads.



Arch Shape

The Arch is the most natural of all bridge forms and is generally considered one of the most aesthetically pleasing bridge types.





Corrugation

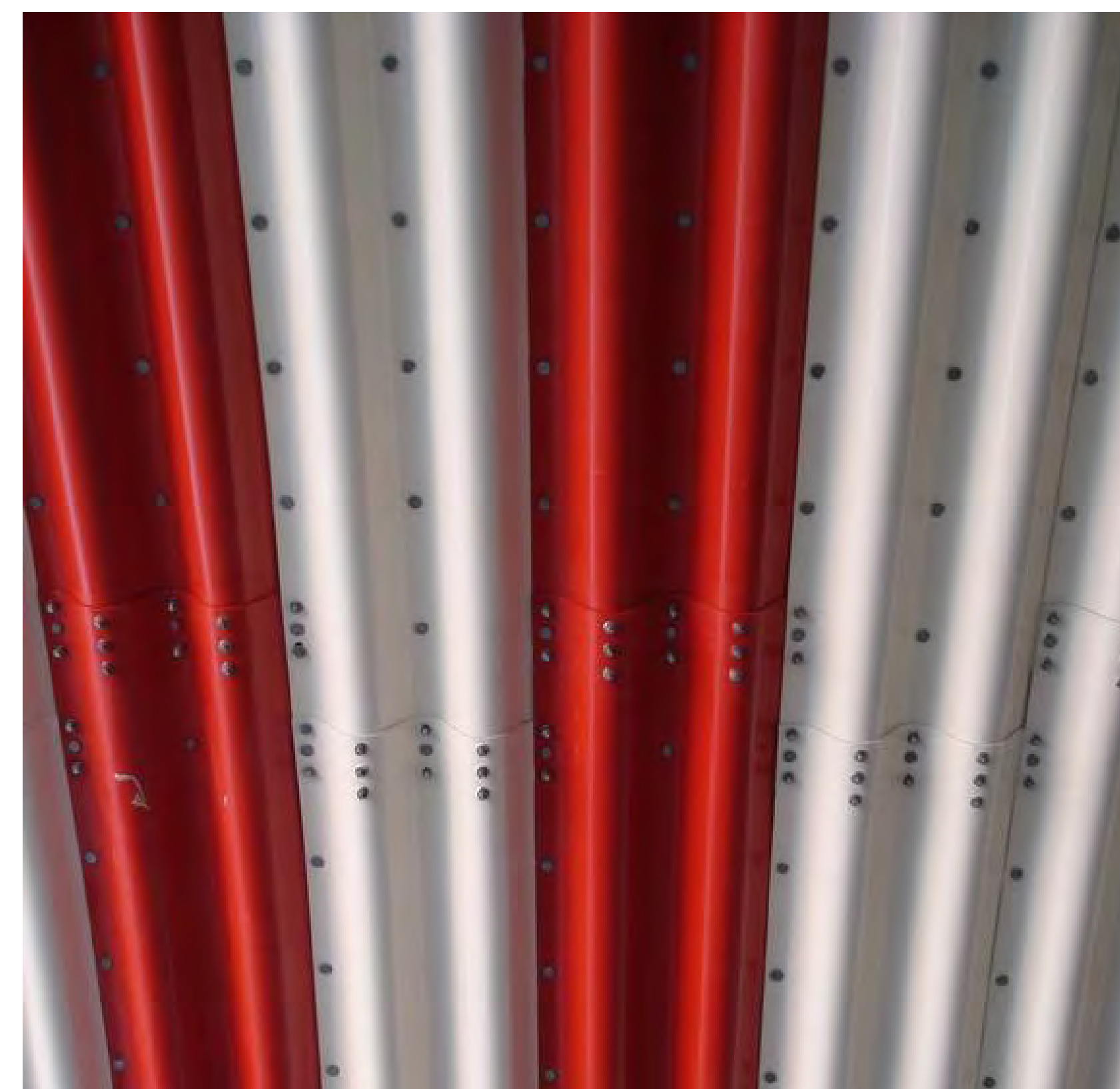
Texture is found on the surface of all objects, and it is closely related to the form.







In aesthetic design, the most proportional relationships are based on the relative size and shape of the elements with proportional degrees of surface texture, color, and light.





People find that the structures around them created by illuminated systems facilitate orientation, convey messages, communicate emotions and create attention.







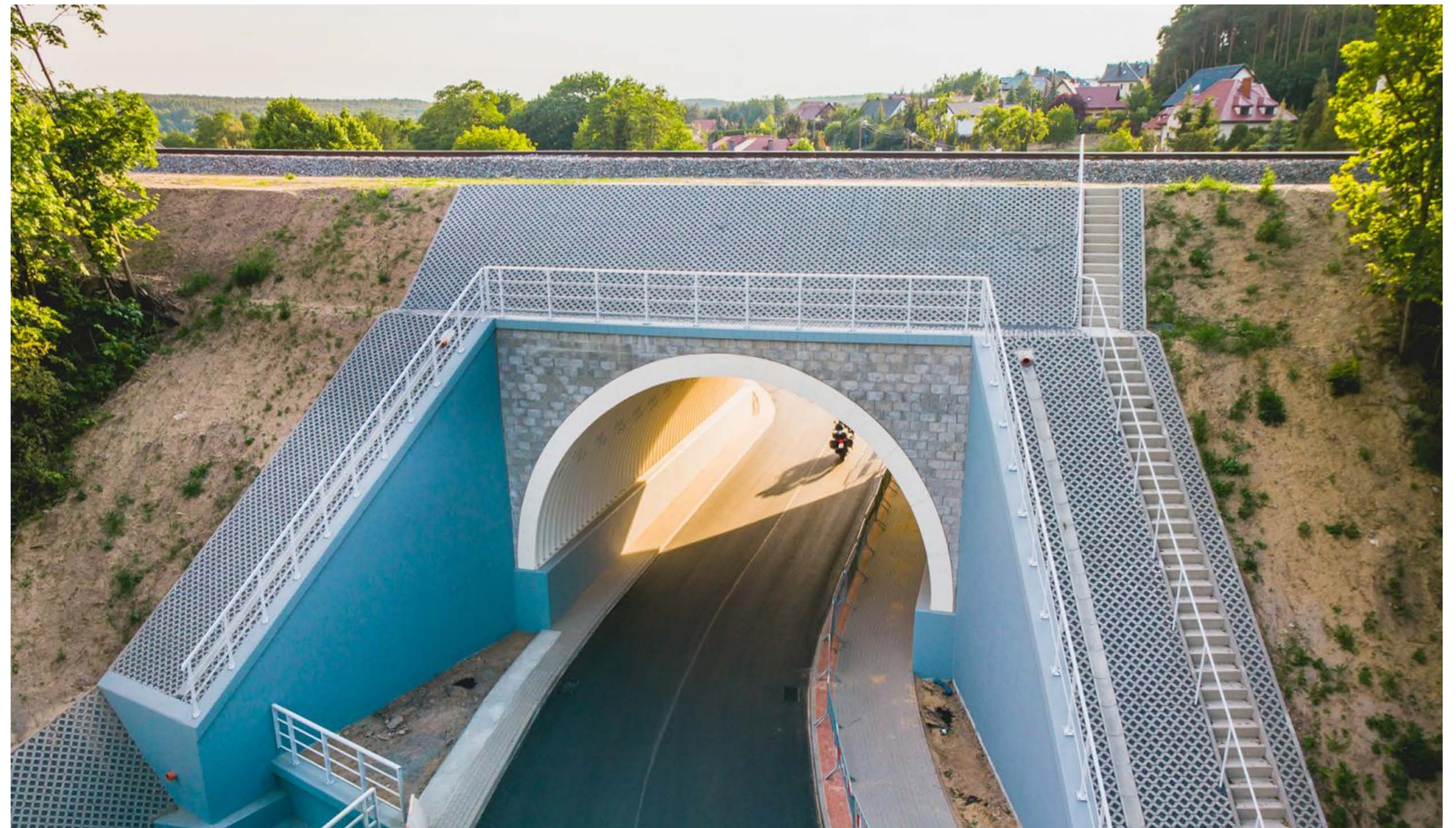
Landscape Patterns



Ending treatments
(inlet/outlet)



Ending Treatments



Design of ending treatment is considering project location and function.

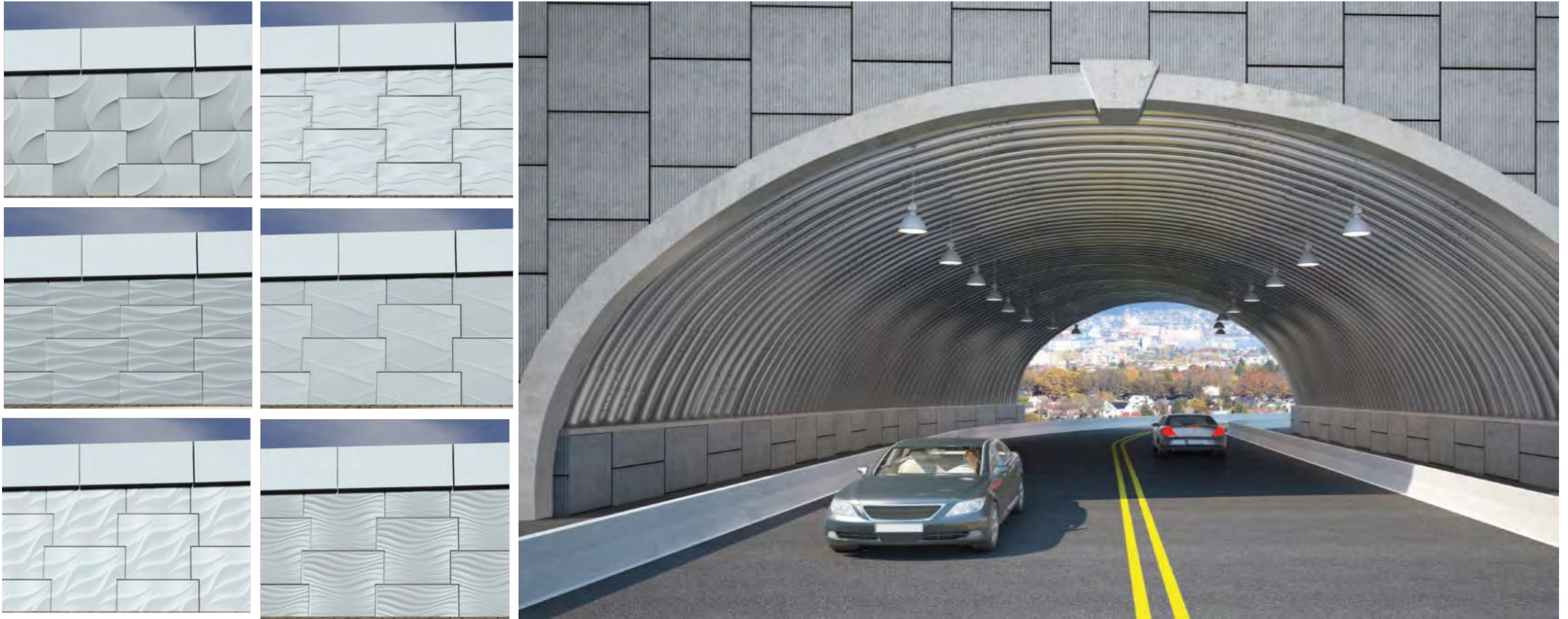
Ending Treatments



Finland



Ending Treatments



Ending Treatments



Urban Landscape Concept



Artistic Approach

- Aesthetics (objective)
- Function

Urban View



Functional Approach

- Aesthetics (objective)
- Function

Spatial Structure



Perceptual/Contextual Approach

- Aesthetics (objective)
- Function
- Identity
Meaning
Culture
History

Socio-Spatial Structure



Sustainable Approach

- Aesthetics (objective)
- Function
- Identity
Meaning
Culture
History
- Ecology

Sustainable Socio –
Spatial Structure

Urban Landscape Concept



Functional Approach



Shamal Bridge UAE - UltraCor



LARGEST METAL BURIED BRIDGE SPAN

REAL VISUAL IMPACT IN ANY URBAN ENVIRONMENT

Functional Approach





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Urban Landscape Concept



Artistic Approach

- Aesthetics (objective)
- Function

Urban View



Functional Approach

- Aesthetics (objective)
- Function

Spatial Structure



Perceptual/Contextual Approach

- Aesthetics (objective)
- Function
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Meaning
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History

Socio-Spatial Structure



Sustainable Approach

- Aesthetics (objective)
- Function
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History
- Ecology

Sustainable Socio –
Spatial Structure

Urban Landscape Concept

Perceptual/Contextual Approach

- Aesthetics
(objective)
- Function
- **Identity**
Meaning
Culture
History

Socio - Spatial Structure



Perceptual/contextual approach



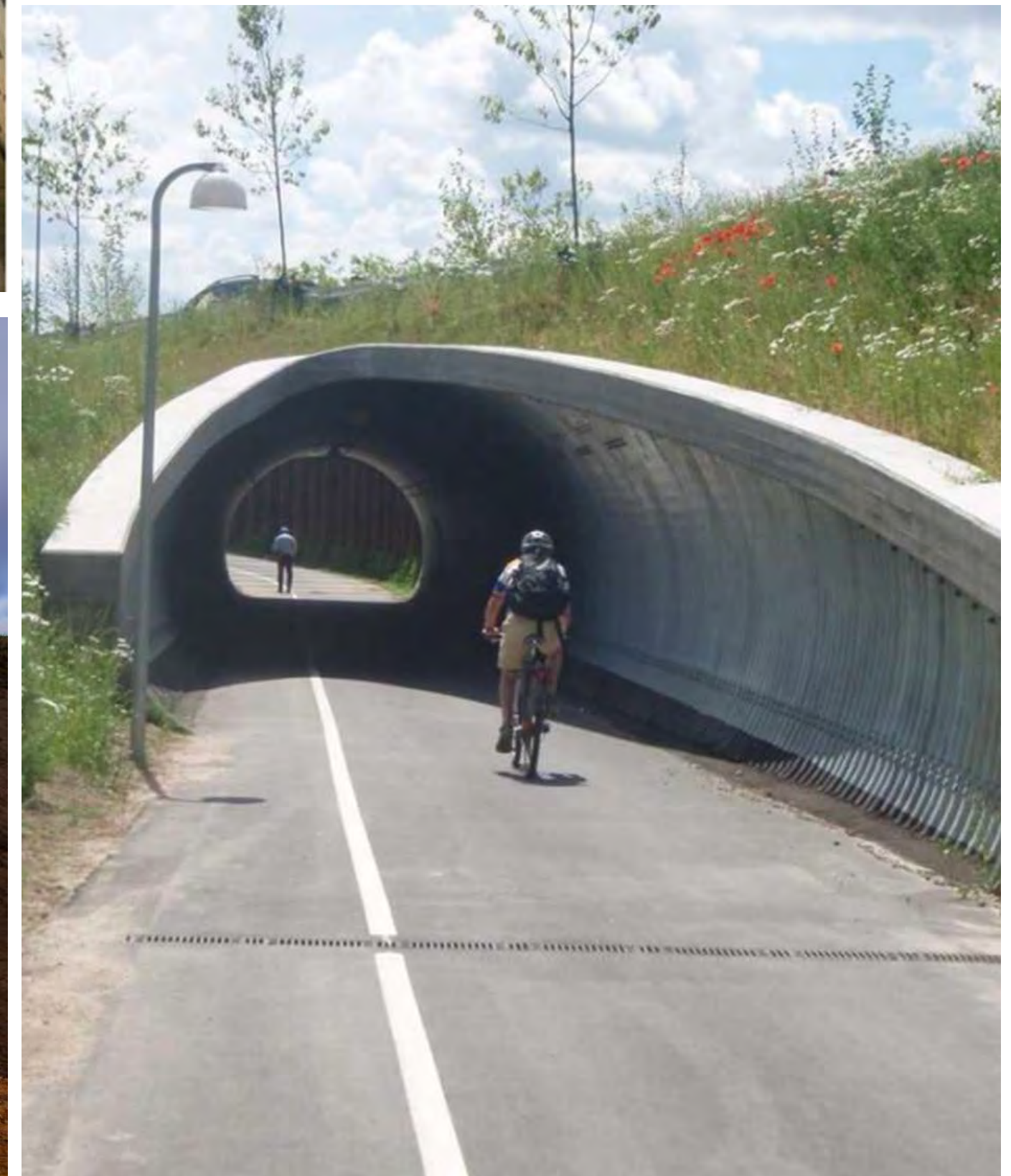
“Every bridge is in some degree a historical document,
a demonstration of structural technique,
a performance test of building materials,
a comment on the values of society which produced it,
and a reflection of the richness or poverty of its
designer’s imagination”



Perceptual/Contextual Approach



"People should feel that some part of the environment 'belongs' to them, individually and collectively, whether they own it or not"



Urban Landscape Concept



Artistic Approach

- Aesthetics (objective)
- Function

Urban View



Functional Approach

- Aesthetics (objective)
- Function

Spatial Structure



Perceptual/Contextual Approach

- Aesthetics (objective)
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Socio-Spatial Structure



Sustainable Approach

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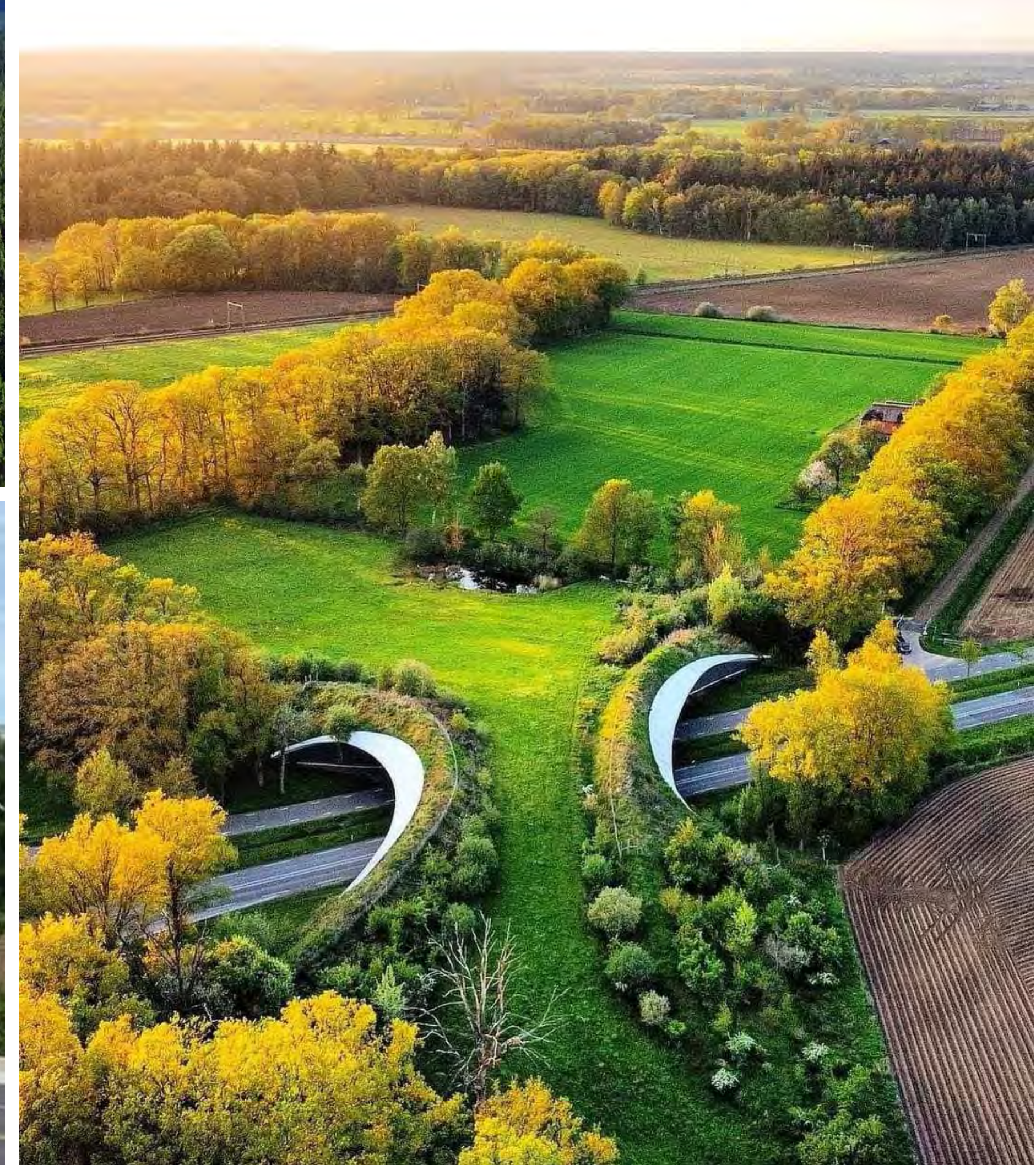
Sustainable Socio –
Spatial Structure

Urban Landscape Concept

Sustainable Approach

- Aesthetics (objective)
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Culture
History
- Ecology

Sustainable Socio - Spatial Structure



Sustainable Approach



Buried Steel Bridges have a substantially lower life cycle of carbon footprint than concrete bridges

- Use less energy in production and shipping
- Contain recycled steel
- Bult in significantly less time
- Require less maintenance



EFFICIENT AND SUSTAINABLE INFRASTRUCTURE SOLUTION



A final word about Bridges & Culverts applications in urban environments

SUMMARY

1. Part #1: B&C in landscape outside urban area

- An overview covering the general technical information
- The possible functions and applications
- Examples of B&C in natural environments with 2 options: exposed as a landmark; or immersed in surroundings

2. Part #2: B&C solutions in inlet and outlet

- The typical approach of a hydraulic engineer responsible for optimizing the water-flow function
- Four different possibilities of shaping the inlet and outlet from the hydraulic point of view

3. Part #3: B&C solutions in urban area

- Artistic approach - with chosen arch shape, structure corrugation and ending treatment, unlimited options with colors, lighting effects, texture materials
- Functional approach - fulfill needed function even in very dense urban areas
- Perceptual/contextual approach - identification with the place or unique life events



THANK YOU

AND SEE YOU AGAIN, SOON.