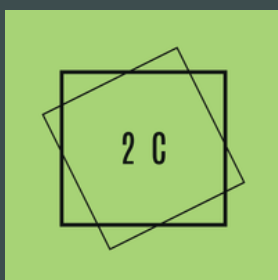


# Enhancing Infrastructure Durability with ElaProof ↗

A Long-Term Waterproofing and Protection  
Solution for Bridges, Roads, & Buildings



**Kaksi Consultants, LLC**

[www.kaksiconsultants.com/elaproof](http://www.kaksiconsultants.com/elaproof)

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# Executive Summary

ElaProof gives public agencies a way to stretch every infrastructure dollar further by turning protective coatings into a long-term savings engine, not a recurring expense. This whitepaper shows how elastic, durable membranes can extend the life of bridges, roofs, decks, and public buildings, reducing the frequency and scope of major repairs and resurfacing projects.

By replacing rigid, short-lived, solvent-heavy products with a water-based, highly elastic system, agencies can better withstand movement, leaks, and harsh weather while cutting back on repeat work and emergency fixes. For DOTs, Public Works, and city leaders under budget pressure, the paper highlights how fewer interventions, less material waste, and shorter disruptions translate into measurable lifecycle savings and a lower total cost of ownership -while still supporting environmental and ESG commitments.



# The Infrastructure Challenge

Bridges, roads, and concrete transport structures face progressive deterioration driven primarily by moisture infiltration and environmental exposure. Small cracks and surface defects allow water to penetrate structural elements, accelerating corrosion of reinforcement and weakening concrete over time. In cold climates, freeze-thaw cycles further expand cracks, leading to spalling, delamination, and premature failure.

Traditional waterproofing systems often struggle to accommodate structural movement or require complex, hazardous installation processes. As a result, infrastructure owners experience frequent repairs, traffic disruption, and rising maintenance budgets.

Government agencies are increasingly required to balance durability, safety, environmental responsibility, and cost efficiency. Protective systems must not only perform technically but also align with sustainability goals, occupational safety standards, and long-term asset management strategies.

Addressing these challenges requires proven, adaptable solutions capable of protecting infrastructure assets throughout their full service life, while reducing the frequency and cost of intervention.



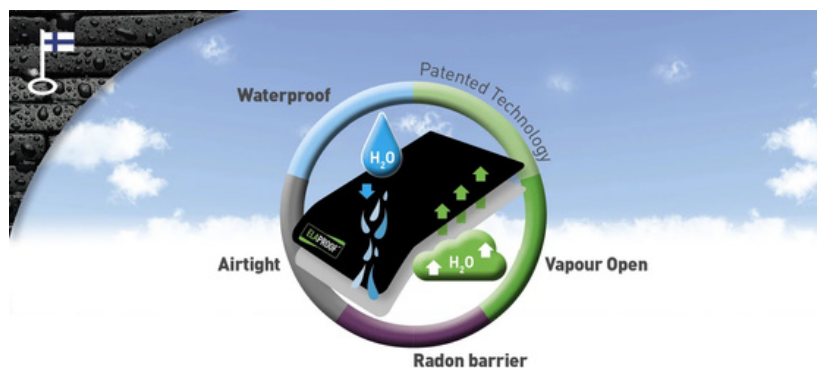
# Introducing ElaProof

ElaProof is a one-component, water-based elastic polymer coating designed to provide long-lasting waterproofing and surface protection for infrastructure applications. Once applied, it forms a seamless, joint-free membrane that bonds directly to the substrate, eliminating common failure points found in sheet or layered systems.

A key feature of ElaProof is its ability to bridge cracks and accommodate structural movement without losing adhesion or waterproofing performance. This elasticity makes it particularly suitable for bridges, road decks, and concrete structures exposed to temperature variation, vibration, and traffic loads.

ElaProof is isocyanate-free, solvent-free, and low-emission, offering a safer alternative to conventional polyurethane or solvent-based coatings. It can be applied by spray, roller, or trowel, even on slightly moist surfaces, simplifying installation and reducing project downtime. The product has been developed and tested in demanding Nordic conditions, making it well suited for harsh infrastructure environments.

- ElaProof Cool Roof has been independently tested and rated by CRRC.
- Tests showed high solar reflectance (reported up to  $\approx 82\%$  reflected solar radiation).
- This verifies that the coating can reduce roof temperature and cooling energy demand.



# ElaProof: Durability, Performance, and Infrastructure Protection

## **ElaProof: Durability, Performance, and Infrastructure Protection**

ElaProof is an advanced elastic coating system designed to protect infrastructure from environmental stress, corrosion, and structural movement. By combining long-term durability with flexible application and strong environmental safety characteristics, ElaProof provides a reliable solution for extending the service life of concrete and steel structures.

### **Extreme Elasticity and Crack Bridging**

ElaProof remains highly flexible even under harsh environmental conditions. The coating can expand and retract up to 800% without cracking, allowing it to accommodate structural movement, thermal expansion, and micro-cracking within the substrate. This elasticity significantly reduces the likelihood of coating failure and helps maintain a continuous protective barrier over time. Laboratory testing indicates a lifetime of over 70 years, with approximately 25 years of proven real-world performance. The material can also bond substrates with large differences in thermal expansion coefficients, making it uniquely suited for complex infrastructure systems.

### **Superior Durability in Harsh Environments**

ElaProof creates a resilient barrier against water, salts, chemicals, and ultraviolet radiation. By preventing moisture penetration, the coating helps slow reinforcement corrosion and concrete degradation, which are major causes of infrastructure deterioration. This protective barrier is particularly valuable in coastal and high-moisture environments, where exposure to salt and water can significantly accelerate structural damage.

## **Simplified Application and Surface Preparation**

ElaProof is a one-component coating that can be applied directly to damp substrates, reducing preparation time and simplifying installation. Minimal surface preparation is required; only loose rust or debris must be removed, typically through pressure washing. Sandblasting or primers are generally unnecessary. The coating can be sprayed or painted onto concrete, steel, or rusted surfaces, where it forms a strong bond and prevents further corrosion.

## **Safety and Environmental Compliance**

ElaProof contains no harmful VOCs, solvents, or isocyanates, making it safer for workers and the surrounding environment. The non-toxic formulation supports compliance with environmental and occupational health standards increasingly required in modern infrastructure projects and public procurement policies. Additionally, the coating does not ignite or sustain combustion independently, contributing to improved safety in transportation and urban infrastructure environments.

## **Lifecycle Cost Efficiency**

The long service life and durability of ElaProof significantly reduce maintenance cycles and long-term repair costs. Because the coating remains flexible and resistant to environmental damage, structures require fewer interventions over time. When repairs are needed, local areas can be easily recoated, avoiding large-scale rehabilitation work. Faster application and minimal surface preparation also reduce downtime and operational disruption, which is especially valuable for bridges, transit systems, and other critical infrastructure that must remain operational during maintenance.

## **Versatile Infrastructure Applications**

ElaProof is suitable for a wide range of infrastructure assets, including:

- Bridge decks and pier caps
- Concrete joints and expansion areas
- Walkways and pedestrian structures
- Retaining walls
- Subway tunnels and transit infrastructure
- Steel and concrete supporting structures

Its combination of elasticity, durability, and ease of application makes ElaProof a versatile protective solution across diverse infrastructure portfolios.

# ElaProof: Reducing Radon Risks

## Radon in the United States

Radon is a naturally occurring radioactive gas formed through the breakdown of uranium in soil and rock, a process known as Radioactive Decay. Because radon is colorless, odorless, and tasteless, it can accumulate indoors without being detected unless a building is specifically tested.

According to the United States Environmental Protection Agency (EPA), radon is the second leading cause of lung cancer in the United States and the leading cause among non-smokers, contributing to an estimated 21,000 deaths each year. The EPA also estimates that approximately one in fifteen U.S. homes has radon levels above the recommended action level of 4 pCi/L.

Radon typically enters buildings through openings in foundations, including cracks in concrete slabs, construction joints, gaps around pipes and utility penetrations, sump pits, and porous building materials. Once inside, radon can accumulate in basements and lower levels, particularly in tightly sealed or poorly ventilated structures.

## ElaProof as a Radon-Resistant Barrier

ElaProof is an elastic, water-based polymer membrane designed to create a continuous airtight seal across structural surfaces. When applied to foundations, slabs, joints, and penetrations, the coating forms a durable barrier that helps prevent soil gases—including radon—from entering a building.

### Key benefits include:

- **Airtight membrane that helps block soil gas infiltration**
- **Crack-bridging flexibility for sealing small structural openings**
- **Strong adhesion to concrete, masonry, and other construction materials**
- **Waterproofing protection that also reduces moisture intrusion**
- **Solvent-free formulation suitable for interior and exterior applications**

By sealing common radon entry points, ElaProof can serve as an effective component of radon-resistant construction and building retrofits.

## Supporting Effective Radon Mitigation

Radon mitigation often combines multiple strategies to reduce radon entry and remove soil gases from beneath buildings. ElaProof can be used alongside widely accepted mitigation practices, including sub-slab depressurization systems, passive radon vent piping, and crawlspace membranes.

Professional organizations such as the American Association of Radon Scientists and Technologists and the National Radon Proficiency Program emphasize the importance of sealing structural pathways as part of an integrated radon mitigation approach.

By creating a durable airtight barrier across foundation surfaces, ElaProof helps limit radon infiltration while supporting healthier indoor environments and improved building performance. 8

# Role of Kaksi Consultants

KAKSI Consultants supports the strategic adoption of innovative infrastructure technologies such as ElaProof by providing commercialization, market entry, and implementation advisory services. For government agencies and public sector stakeholders, KAKSI acts as a bridge between technology providers and infrastructure decision-makers.

KAKSI assists in evaluating technical suitability, defining application scenarios, and aligning solutions with regulatory and procurement frameworks. This includes support for pilot project planning, performance assessment approaches, and lifecycle cost considerations.

In addition, KAKSI provides guidance on market positioning, stakeholder engagement, and partnership structures to ensure successful and scalable implementation. By combining technology insight with public-sector focused consulting, KAKSI helps authorities make informed, risk-aware decisions when introducing new protective systems into infrastructure programs.



# Conclusion

Protecting bridges and roads requires solutions that deliver durability, safety, and long-term value. ElaProof offers a modern waterproofing and protection system that addresses the key challenges facing public infrastructure assets today. When supported by the strategic advisory capabilities of KAKSI Consultants, it enables authorities to move from reactive repair toward proactive asset preservation. By extending service life and reducing maintenance demands, ElaProof supports resilient, sustainable, and cost-effective infrastructure for the future.

**Protecting public assets longer, at lower lifecycle cost...save millions**



# Product Spec Sheet

High-performance, one-component, water-based elastic coating designed for long-term waterproofing and protection of bridge structures, traffic-bearing decks, road-adjacent concrete, and flat or low-slope roofs. Engineered for harsh climates, movement, and heavy use.

## Core performance

- Type: One-component, waterborne elastomeric coating
- Use areas: Bridge decks and substructures, parking decks, podiums, culverts, retaining walls, flat and low-slope roofs on public buildings
- Crack-bridging: High crack-bridging capacity (over 10 mm class, system-dependent)
- Service temperature: Approximately -30 °C to +150 °C (short peaks higher, system-dependent)
- Water tightness: Seamless waterproof membrane at specified film thickness
- Weather and UV resistance: Designed for long-term outdoor exposure and freeze-thaw cycling
- Water vapor behavior: Breathable membrane (vapor-open, water-tight) to reduce blistering and moisture trapping

## Environmental and safety profile

- Chemistry: Isocyanate-free, solvent-free, low VOC
- Worker safety: Neutral pH, no hazardous solvents; easy handling with standard PPE
- Certifications (typical systems):
  - CE-marked as a construction product under EN 1504-2 (concrete protection) and EN 13813 (flooring/overlay)
  - Fire performance classifications suitable for roofs and exterior applications (e.g., C-s1,d0, BROOF class – confirm per system)
- Supports public sector goals for low-emission, sustainable materials and green procurement

## Application to bridges and roads

- Typical substrates: Cast-in-place and precast concrete, steel, galvanized steel, bitumen membranes, old overlays (if sound and prepared)
- Use cases:
  - Bridge decks and approach slabs (as part of system build-up)
  - Abutments, piers, parapets, retaining structures
  - Parking decks, podiums, and traffic-adjacent slabs
- **Advantages for agencies:**
  - Elastic membrane accommodates movement and micro-cracking, reducing chloride and water ingress
  - Strong adhesion supports rehabilitation of aging concrete rather than full replacement
  - Fast curing (weather-dependent) helps shorten lane closures and construction windows

# Product Spec Sheet Cont'd

## Application to public roofs

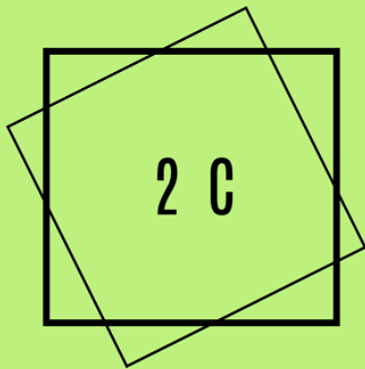
- Typical substrates: Concrete roofs, bituminous membranes, metal roofs, wood-based panels, existing roof coverings (if sound)
- Use cases: Schools, municipal buildings, depots, transit facilities, water and wastewater plants
- Functional benefits:
  - Seamless, joint-free waterproofing reduces leak points and detailing complexity
  - High elasticity manages thermal movement and settling without splitting
  - Can be used to refurbish many aging roofs instead of replacing full assemblies

## Installation and typical consumption

- Application methods:
  - Hand-applied: brush, roller, trowel for detailing and smaller areas
  - Spray-applied: high-pressure equipment for large decks, roofs, and walls
- Substrate condition: Sound, clean, and load-bearing; can be applied to many damp surfaces per system guidelines
- Typical dry film thickness: Approx. 1.0–1.5 mm total (system-specific, multiple coats)
- Approximate consumption: 1.0–2.0 l/m<sup>2</sup> depending on roughness, detail level, and system build-up
- Drying/curing (indicative):
  - Touch dry in a few hours under standard conditions
  - Weatherproof after recommended curing period
  - Full mechanical and chemical resistance after full cure per system data

## Lifecycle and cost advantages for DOTs and public works

- Extends service life of bridge decks, road-adjacent structures, and roofs by protecting against water, salts, and thermal cycling
- Enables rehabilitation and over-coating strategies, deferring expensive tear-offs and structural replacements
- Reduces maintenance frequency, emergency leak interventions, and associated traffic or facility closures
- Lowers total lifecycle cost of bridges, roads, and roofs while helping agencies meet safety, resilience, and sustainability targets



**Kaksi Consultants, LLC**  
New York- Helsinki



# Let's Work Together ↗

## Contact Us



+914-484-1064



[george.hall@kaksiconsultants.com](mailto:george.hall@kaksiconsultants.com)



<https://kaksiconsultants.com/elaproof>